Sibanye-Stillwater: Eastern Platinum (Pty) Ltd

Re-mining of Tailings Dam 2

Draft Basic Assessment Report

DMRE Mining Right Reference Number: NW30/5/1/2/2/109 MR

October 2023

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October 2023

Project Ref: 5500918165

Prepared by: Suzanne van Rooy

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Alta van Dyk Environmental cc

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Reviewed by: Alta van Dyk

Approved by: Alta van Dyk

Signed:

Position: Environmental Specialist

Date: October 2023

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT BASIC ASSESSMENT REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT ACTIVITIES

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998, AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 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)

NAME OF APPLICANT:	Eastern Platinum (Pty) Ltd
PROJECT:	Re-mining of Tailings Dam 2
CONTACT PERSON:	Portia Shezi
TEL NO:	014 495 1905
FAX NO:	014 571 2037
POSTAL ADDRESS:	Private Bag X508, Marikana, North West Province, 0284
PHYSICAL ADDRESS:	Middelkraal Farm, LPD Building, Marikana, North West Province, 0284
DMRE Reference No:	NW30/5/1/2/2/109 MR
	NW 30/5/1/2/3/2/2/111 EM

IMPORTANT NOTICE

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, 2014, 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 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.

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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:
    (i) The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
    (ii) The degree to which these impacts-
        (aa) can be reversed;
        (bb) may cause irreplaceable loss of resources; and
        (cc) can be managed, avoided or mitigated;
e) 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.

Table of Contents

Tables

Figures

Abbreviations

AVDE	Alta van Dyk Environmental Consultants
BAR	Basic Assessment Report
BMR	Base Metal Refinery
BTT	Bulk Tailings Treatment
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EBTT	Eastern Bulk Tailings Treatment
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EMS	Environmental Management Systems
EN	Endangered
EPC	Eastern Platinum Concentrator
EPL	Eastern Platinum (Pty) Ltd
ESA1	Ecological Support Area
NAAQS	National Ambient Air Quality Standard
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Areas
NPAES	National Protected Areas Expansion Strategy
NWA	National Water Act
NWDEDECT	North West Department of Economic Development, Environment, Conservation and Tourism
PGM	Platinum Group Metals
RWD	Return Water Dam
SACAD	South Africa Conservation Areas Database
SACNASP	South African Council for Natural Science Professions
SAHRA	South African Heritage Resources Agency
SAIIAE	South African Inventory of Inland Aquatic Ecosystems
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency
SAPAD	South Africa Protected Areas Database
SCC	Species of Conservation Concern
SWSA	Strategic Water Source Areas
TD	Tailings Dam

TDF	Tailings Dam Facilities
TSP	Total suspended particles
UG2	Upper Group 2
WPL	Western Platinum (Pty) Ltd
WUL	Water Use Licence

PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1 Introduction and scope of report

1.1 Introduction

Sibanye-Stillwater owns and operates the Marikana Operations located near Marikana Town, in the North West Province. The Marikana Operations are divided into Western Platinum (Pty) Ltd (WPL) and Eastern Platinum (Pty) Ltd (EPL), each with its own set of mining rights. The Marikana Operations are currently mining both the Merensky and Upper Group 2 Reef (UG2) for Platinum Group Metals (PGMs).

The EPL Tailings Dam Complex comprises two tailings dams, namely Tailings Dam 1 (TD1) and Tailings Dam 2 (TD2). TD1 has been dormant since October 2004 and re-mining of this facility commenced in February 2018. TD2 has been operational since 2002 with tailings deposited from EPL and Eastern Platinum Concentrator (EPC) plants.

The EPL Tailings Dam Complex and the remining of TD1 is included in EPL's approved Final Environmental Impact Assessment and Environmental Management Programme (approved on 16 January 2017, Reference Number NW 30/5/1/2/3/2/2/111 EM).

It is the intention of Sibanye-Stillwater to commence with the re-mining of TD2, once the re-mining of TD1 is completed. Re-mining will be undertaken via a hydraulic mining process and tailings material will be transported in existing pipelines to the UG2 Concentrator for re-treatment. Before Sibanye-Stillwater may commence with the re-mining of TD2, environmental related authorisations need to be obtained.

1.2 Authorisations required

Before Sibanye-Stillwater may commence with the re-mining of EPL TD2, the following environmental related authorisations are required:

- A Basic Assessment environmental authorisation process in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) Regulations (2014, as amended). The competent authority for this process is the North West Department of Mineral Resources and Energy (DMRE).
- A General Authorisation in terms of the National Water Act (Act No. 36 of 1998) (NWA). The competent authority for this process is the Department of Water and Sanitation (DWS).

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

The Basic Assessment environmental authorisation process is illustrated in Figure 1.

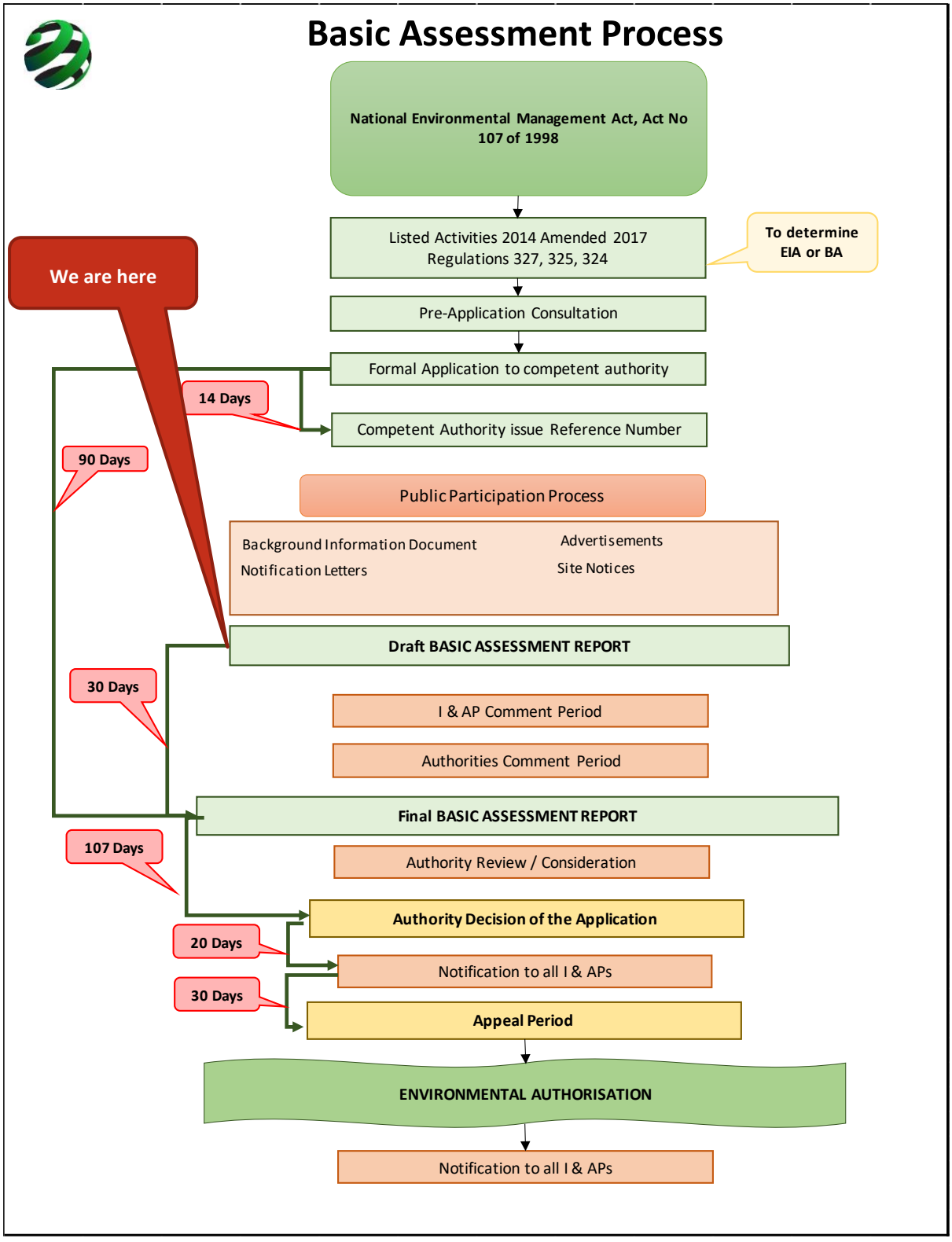


Figure 1: Basic Assessment environmental authorisation process

1.3 Purpose of the Report

The Draft Basic Assessment Report (BAR) has been compiled in support of the environmental authorisation process required before the proposed project may commence. The Draft BAR documents the steps undertaken during the basic assessment process to assess the significance of impacts and determine measures to mitigate

the potential impacts identified and enhance the benefits (or positive impacts) of the proposed project. The report presents the findings of the impact assessment and a description of the public participation undertaken that forms part of the Basic Assessment process. More specifically, the objectives of this BAR are to:

- Inform the stakeholders about the proposed project and the basic assessment process followed;
- Obtain contributions from stakeholders (including the applicant, consultants, relevant authorities and the public) and ensure that all issues, concerns and queries raised are fully documented and addressed;
- Assess in detail the potential environmental and socio-economic impacts of the project;
- Identify environmental and social mitigation measures to address the impacts assessed; and
- Produce a BAR that will assist the competent authority, the DMRE, to decide whether (and under what conditions) to authorise the proposed project.

1.4 Content of the Final Basic Assessment Report

The Draft BAR has been compiled in accordance with the requirements of Government Notice R982 dated 4 December 2014 (as updated), Section 3 of Appendix 1. These requirements and the sections of this Draft BAR in which they are addressed, are summarised in Table 1.

Table 1: Requirements of the BAR

No	Description	Reference
3 (1)	A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-	
a)	details of:	
	(i) the EAP who prepared the report; and	Part A Section 2.2
	(ii) the expertise of the EAP, including a curriculum vitae;	Part A Section 2.2.1 and 2.2.2 Appendix A
b)	The location of the activity, including:	Part A Section 3
	(i) the 21 digit Surveyor General code of each cadastral land parcel	Table 5
	(ii) where available, the physical address and farm name;	Table 5
	(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	N/A
c)	A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale	Figure 2 Figure 3
d)	A description of the scope of the proposed activity, including:	
	(i) All listed and specified activities triggered and being applied for	Table 6
	(ii) A description of the associated structures and infrastructure related to the development	Part A Section 5
e)	A description of the policy and legislative context within which the development is proposed including	
	(i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report;	Part A Section 6
	(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Part A Section 6
f)	A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location	Part A Section 7
g)	A motivation for the preferred site, activity and technology alternative	Part A Section 8

No	Description	Reference
h)	A full description of the process followed to reach the proposed development footprint within the approved site, including:	
	(i) Details of all the alternatives considered;	Part A Section 8
	(ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Part A Section 9
	(iii) A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them	Table 11
	(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Part A Section 10
	(v) The impacts and risks identified, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed, may cause irreplaceable loss of resources, and can be avoided, managed or mitigated	Part A Section 11
	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives	Part A Section 11.2
	(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	Table 35 Table 36
	(viii) The possible mitigation measures that could be applied and level of residual risk;	Table 35 Table 36
	(ix) The outcome of the site selection matrix	Part A Section 8
	(x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	N/A
	(xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity	Part A Section 13
i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity, including:	
	(i) A description of all environmental issues and risks that were identified during the environmental impact assessment process	Table 35 Table 36
	(ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Table 35 Table 36
j)	An assessment of each identified potentially significant impact and risk, including:	Table 35 Table 36
	(i) Cumulative impacts	
	(ii) The nature, significance and consequences of the impact and risk	
	(iii) The extent and duration of the impact and risk	
	(iv) The probability of the impact and risk occurring	
	(v) The degree to which the impact and risk can be reversed	
	(vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and	
	(vii) The degree to which the impact and risk can be avoided, managed or mitigated	
k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Section 13.1
l)	An environmental impact statement which contains-	

No	Description	Reference
	(i) A summary of the key findings of the environmental impact assessment	Part A Section 13
	(ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and the infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers	
	(iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives	
m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Part A Section 14
n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Part A Section 15
o)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Part A Section 16
p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Part A Section 17
q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded, and the post construction monitoring requirements finalised	Part A Section 18
r)	An undertaking under oath or affirmation by the EAP in relation to (i) The correctness of the information provided in the reports (ii) The inclusion of comments and inputs from stakeholders and I&APs (iii) The inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Part B Section 11
s)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Part A Section 20
t)	Where applicable, any specific information required by the competent authority; and	Part A Section 21
u)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	N/A

2 Details of Project Applicant and Environmental Assessment Practitioner

2.1 Details of the project applicant

The applicant for this project is Sibanye-Stillwater Eastern Platinum (Pty) Ltd. The details of the applicant are shown in Table 2.

Table 2: Contact details of the applicant

Applicant	Eastern Platinum (Pty) Ltd
Name of operation	Marikana Operations
Postal Address	Private Bag X508 Marikana, North West Province

	0284
Responsible person	Portia Shezi
Telephone number	014 571 2000
Email	portia.shezi@sibanyestillwater.com

2.2 Details of the Environmental Assessment Practitioner who prepared the report

AVDE is appointed as the independent Environmental Assessment Practitioner (EAP) to conduct the environmental authorisation for the proposed project. Details of the EAP are provided in Table 3.

Table 3: Details of the EAP

EAP	Suzanne van Rooy
Company	Alta van Dyk Environmental Consultants cc
Qualifications	MPhil Environmental Management (University of Stellenbosch)
Professional Registrations	Pr.Sci.Nat (Reg nr. 400378/11) EAPASA Registered EAP (Ref 2019/1079)
Postal Address	Postnet Suite # 745 Private Bag X 1007 Lyttelton 0140
Telephone number:	012 940 9457
Fax number:	086 634 3967
Email address	suzanne@avde.co.za

2.2.1 Qualifications of the EAP

Suzanne van Rooy's qualifications include the following:

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

2.2.2 Summary of the EAP's past experience

Suzanne van Rooy holds a Master's Degree in Environmental Management from the University of Stellenbosch. In terms of professional affiliation, Suzanne is registered as a Professional Scientist of Nature (Pr. Sci. Nat) in Environmental Science field of practice with the South African Council for Natural Scientific Professions (SACNASP), registration number 400378/11. Suzanne is also a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA), reference number 2019/1079.

Suzanne's expertise is in the mining industry sector, focussing on Environmental Impact Assessments, Water Use Licence Applications, environmental performance assessments, water use licence audits, public participation and closure cost assessments. Her involvement in such projects varies from project management and co-ordination to the compilation and review of technical and environmental documents and reports. She has been involved in environmental authorisations for both underground and open cast mining operations, as well as the

associated activities such as waste disposal facilities, conveyor routes, access roads, pollution control and other dams, undermining of wetlands and river crossings. She has also conducted various environmental feasibility reporting for potential mining projects.

Suzanne van Rooy meets the requirements for independence as she do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the EIA Regulations, 2017, and has no vested interest in the proposed activity proceeding, and also has no, and will not engage in, conflicting interests in the undertaking of the activity. Refer to Appendix A for the Curriculum Vitae and highest qualification of the EAP.

3 Location of the overall activity

The EPL Tailings Dam Complex is situated near the town of Marikana in the North West Province. It falls within Madibeng Local Municipality and Bojanala Platinum District Municipality. Table 4 indicates administrative boundaries, and Table 5 provide property details. The locality of the EPL Tailings Dam Complex is shown in Figure 2. The distances and direction of the various neighbouring towns from the EPL Tailings Dam Complex are as follows:

- Marikana: 10km west
- Mooinooi: 8km south-west
- Brits: 20km north west

Table 4: EPL administrative boundaries

Province	North West Province
District Municipality	Bojanala Platinum District Municipality
Local Municipality	Madibeng Local Municipality
Ward	40
Water management area	Crocodile (West) and Marico Water Management Area.
Quaternary catchment	A21J/A21K

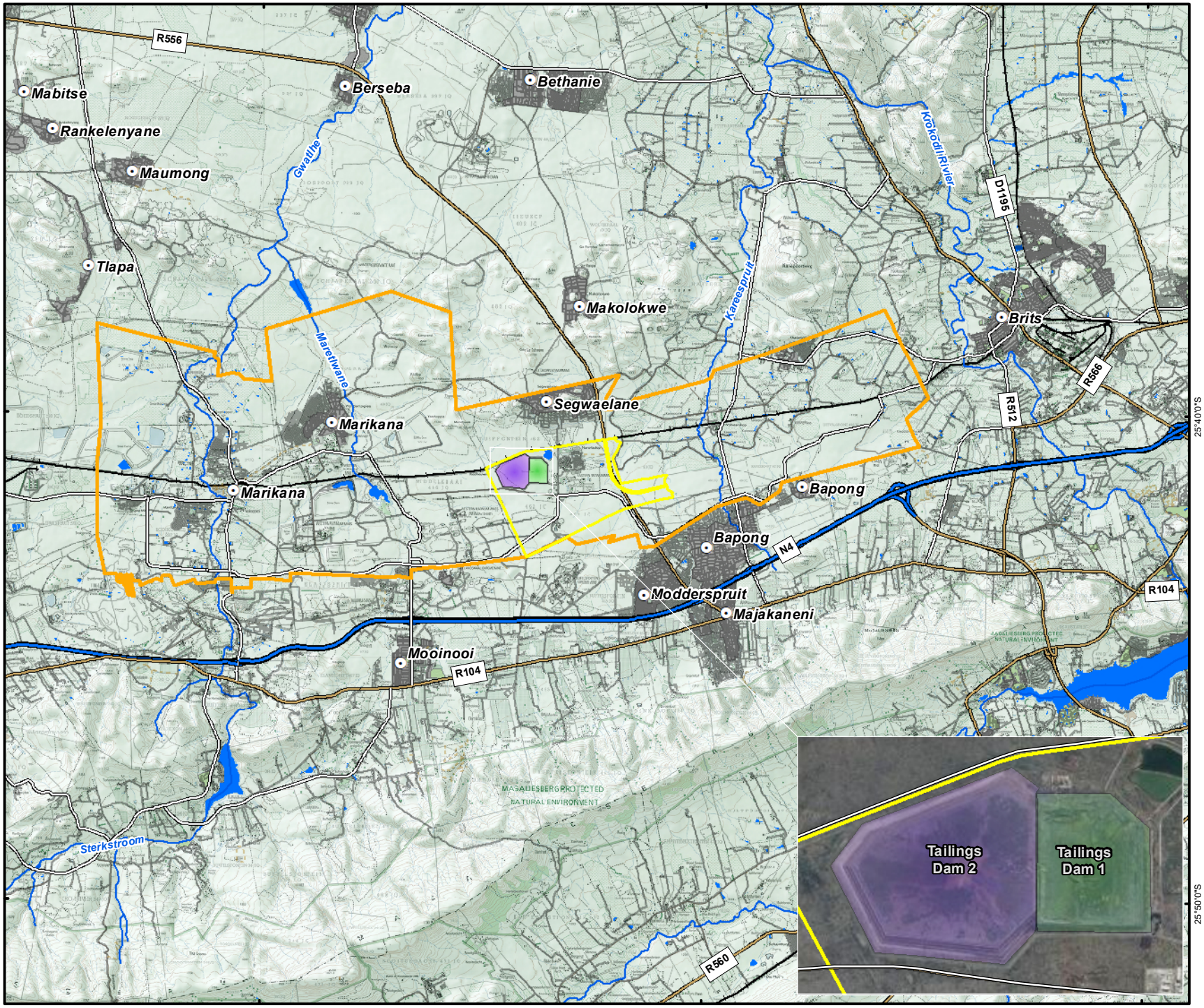
The property description for the proposed retreatment of EPL TD2 is provided in Table 5.

Table 5: Description of the properties applicable to the proposed remining of EPL TD2

Farm name	Turffontein 462 JQ Portion 3
Landowner	Government of the Republic of South Africa
Application area (ha)	~135 ha
Magisterial district	Madibeng Local Municipality Bojanala Platinum District Municipality
Distance and direction from nearest town	12 km east of Marikana 20 km south west of Brits
21-digit Surveyor General code for each farm portion	T0MS00000000010300001
Coordinates of the centre point	22°26'28.94"S 29°20'3.90"E

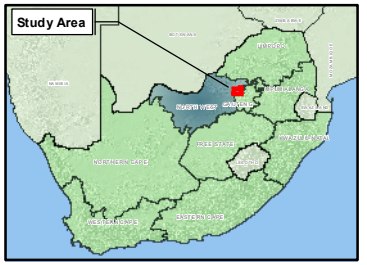
4 Locality map

Figure 2 shows the locality of EPL's TD1 and TD2.



Legend

- Sibanye Mine Lease Boundary
- Turffontein 462 Portion 3
- Tailings Dam 1
- Tailings Dam 2
- Towns
- Buildings/Ruins
- Railway
- Motorway
- Secondary Road
- Tertiary Road
- Street/Road
- Track
- Contours
- Rivers
- Cadastral Farms
- Buidt Up Areas
- Open Areas
- Water Area



SCALE: 1: 150 000

0 2 4 6

Kilometers

N

TITLE:

Locality map of EPL Tailings Dam 1 & 2

CLIENT:

Sibanye-Stillwater

DATE: June 2023	PROJECT: SIBANYE_STILLWATER
DRAWN: THURLOW MAPPING	APPROVED: SVR
MAP: TD1_TD2_LOCALITY	REV: 0

Alta van Dyk Environmental Consultants cc (2011/059764/23)

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Fax: 086 634 3967
Cell: 082 782 4005

Alta van Dyk Environmental

Projection: Transverse Mercator CM: 27 Datum:WGS 84
Source: Chief Directorate National Geo-Spatial Information, NGI_TOPO50_Mosaic_latest_Editions_Jan-2017.ecw
DWA - NGA Geosites Inset: ESRI Data and Maps

SIZE: A4

5 Description of the scope of the proposed overall activity

5.1 Project Background

Sibanye-Stillwater owns and operates the Marikana Operations located near Marikana Town, in the North West Province. The Marikana Operations are divided into (WPL) and Eastern Platinum (Pty) Ltd (EPL), each with its own set of mining rights. The Marikana Operations are currently mining both the Merensky and UG2 for PGMs.

EPL has an approved Final Environmental Impact Assessment and Environmental Management Programme (EIA/EMPr) (approved on 16 January 2017, Reference Number NW 30/5/1/2/3/2/2/111 EM). The following activities are approved in the EIA/EMPr:

- **Exploration:** Merensky and UG2 Chromite reserves are determined and demarcated for mining within the western limb of the Bushveld Complex, by the drilling of exploration boreholes.
- **Mining:** EPL uses both underground and opencast mining methods. Underground mining methods vary between breast mining, up-dip mining, down-dip mining, conventional and mechanised mining. The ore is then broken and transported to the surface by any of the four (4) EPL shafts (consisting of both vertical and incline orientated shafts). The waste rock is transported to the waste rock dumps.
- **Concentrating:** The ore from the mining process is sent to EPL Concentrators (two (2) in total) which involves milling, crushing and flotation of the ore. Opencast ore is however, taken to the Merensky Concentrator at WPL for processing.
- **Tailings Dam Facilities (TDF):** Slime or tailings is used to describe the waste product derived from the concentrator process and is deposited in tailings dam facilities of which EPL has both an active (EPL TD No. 2) and a decommissioned dam (EPL TD No. 1) on site.
- **Smelting and Base Metal Extraction:** Further to the flotation concentrate produced by the concentrating process, the concentrate is exposed to high temperatures at the Smelter and Base Metal Refinery (BMR). This process generates converter matte which is then treated to produce nickel sulphates crystals, copper cathodes and PGM concentrate.
- **Refining:** Final PGM concentrate from Smelter/BMR, located within WPL, is air freighted to the Western Platinum Refinery in Gauteng Province near Brakpan/Springs for further refining to finished metals (PGMs) for the market.

There are also numerous infrastructural and service elements associated with the mining and processing areas including landfill sites, sewage plants, workshops and stores, hostels, road networks and other service and maintenance infrastructural networks.

Sibanye-Stillwater is currently remining EPL TD1. The remining of EPL TD1 will be completed by Q1 2024. Once the remining of EPL TD1 is completed, Sibanye-Stillwater plans to commence re-mining of EPL TD2.

5.2 Tailings Storage Facilities

All the TDFs at EPL are constructed in traditional angle-of-slope style and all bear a very steep side slope. Toe-paddocks are also used to control stormwater around the base of the TDFs with solution trenches leading to the penstock. Seepage and run-off water are sent to the return water dams (RWDs). Particulate matter is mitigated by means of irrigation system management of deposition cycles in strategic areas, chemical suppression and vegetation cover. The side slopes and surface of the decommissioned TDFs are vegetated whereas only the side slopes of the active TDFs are vegetated.

The EPL Tailings Dam Complex comprises two tailings dams, namely TD1 and TD2. The locations of the two tailings dams are illustrated in Figure 3. EPL TD1 has been dormant since October 2004 and re-mining of this facility commenced in February 2018. EPL TD2 has been operational since 2002, with tailings deposited from the EPL and Eastern Platinum Concentrator (EPC) Plants.

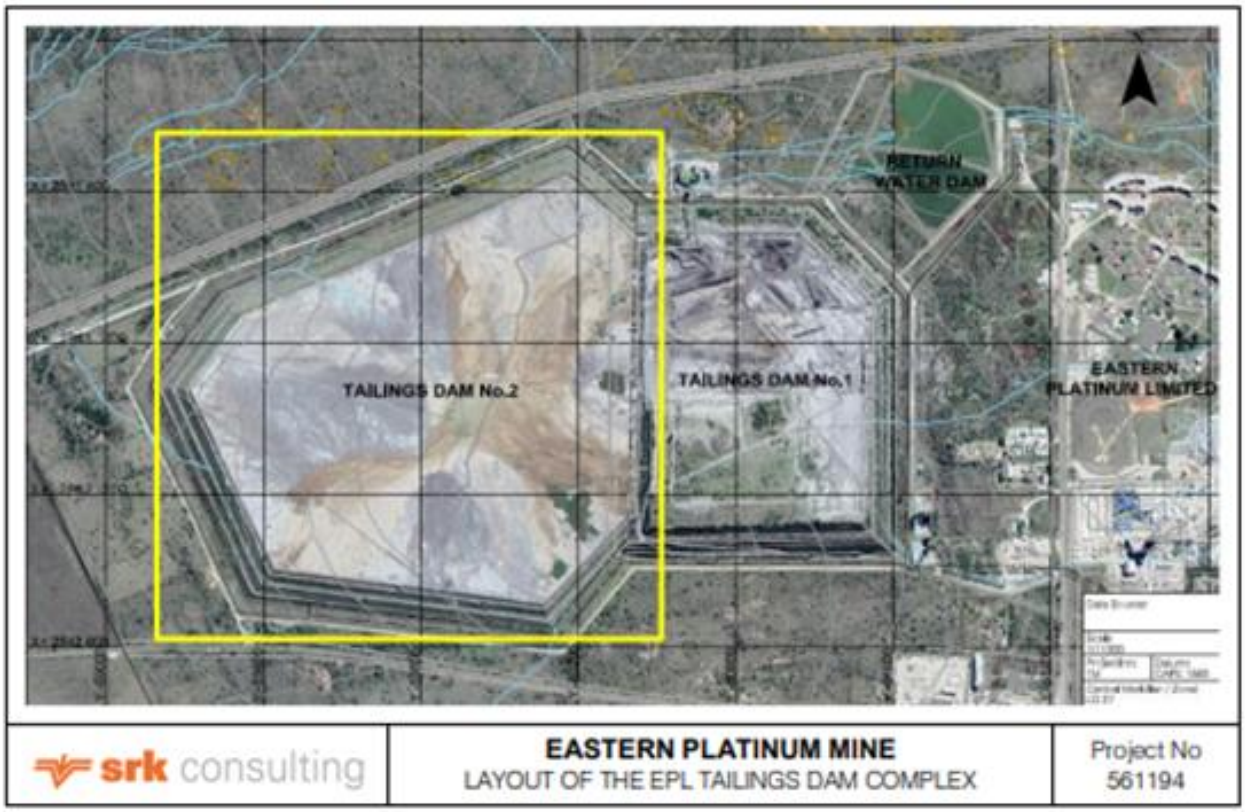


Figure 3: Location of EPL TD1 and EPL TD2

5.3 Current tailings re-treatment

Bulk tailings re-treatment is the re-processing of disposed tailings material from existing concentrators. The process begins by re-mining the tailings material stored in EPL TD1 by means of a high pressure wash-back method, i.e. hydraulic re-mining. Typically, hydraulic re-mining requires approximately 1 ton of water per ton of ore to be re-mined and requires an energy input of approximately 1 MW.

The EPL TD1 tailings dam is re-mined at a maximum rate of 450 000 tons per month. The water required for this project comes from current return water dams, and is recycled via thickeners. Three main steps are involved:

1) Slurry Pumping: The re-mined slurry is pumped from EPL TD1 via an overland pipeline to Western Platinum Limited - UG2 concentrator for processing
2) Processing: The re-mined slurry is re-processed at the existing UG2 concentrator. Chromite is removed at a new chrome removal plant situated at UG2 concentrator
3) Disposal: The fresh tailings post flotation is deposited onto two existing central tailings dams. These will be in Western Platinum Central TD5 and Central TD6.

5.4 Re-mining of TD2

The re-mining of EPL TD1 will be completed by Q1 2024. Once the remining of EPL TD1 is completed, Sibanye-Stillwater plans to commence re-mining of EPL TD2.

The EPL TD2 area footprint is 129 hectares. The current height is around 37m and the rate of rise is around 1.31m/year. The estimated tons deposited onto the dam in 20 years is 58 million tonnes. The re-mining production to Eastern Bulk Tailing Treatment (EBTT) plant will be an average of 320 000 tons/month (3.8mt/year). This will give a re-mine lifetime of 15 years to complete. Drainage water from EPL TD2 will flow the same route back to the RWD. Retreated tailings material will be deposited onto TD6 that can accommodate tailings material up to 2032.

Sibanye-Stillwater will start with hydraulic re-mining with high pressure water guns till a point when the dam is dry enough to start with mechanical re-mining. This will be after approximately five (5) years.

5.4.1 Hydraulic remining

Hydraulic re-mining involves the use of four high pressure water cannons (Figure 4), one at a time depending on where on the dam re-mining (re-pulping) is taken place. The pulped material end up in a sump on the dam with a bare pump (Figure 5). From the sump, the material is pumped to the existing EBTT Plant in existing approved pipelines.

From the EBTT Plant, the slurry is pumped across land in an existing and approved 10km steel pipe to Bulk Tailings Treatment (BTT) plant for processing. The concentrate is sent to the smelter and the tailings material is deposited onto the active and approved WPL TD6 tailings facility.

Figure 4: Example of hydraulic re-mining of a tailings dam facility

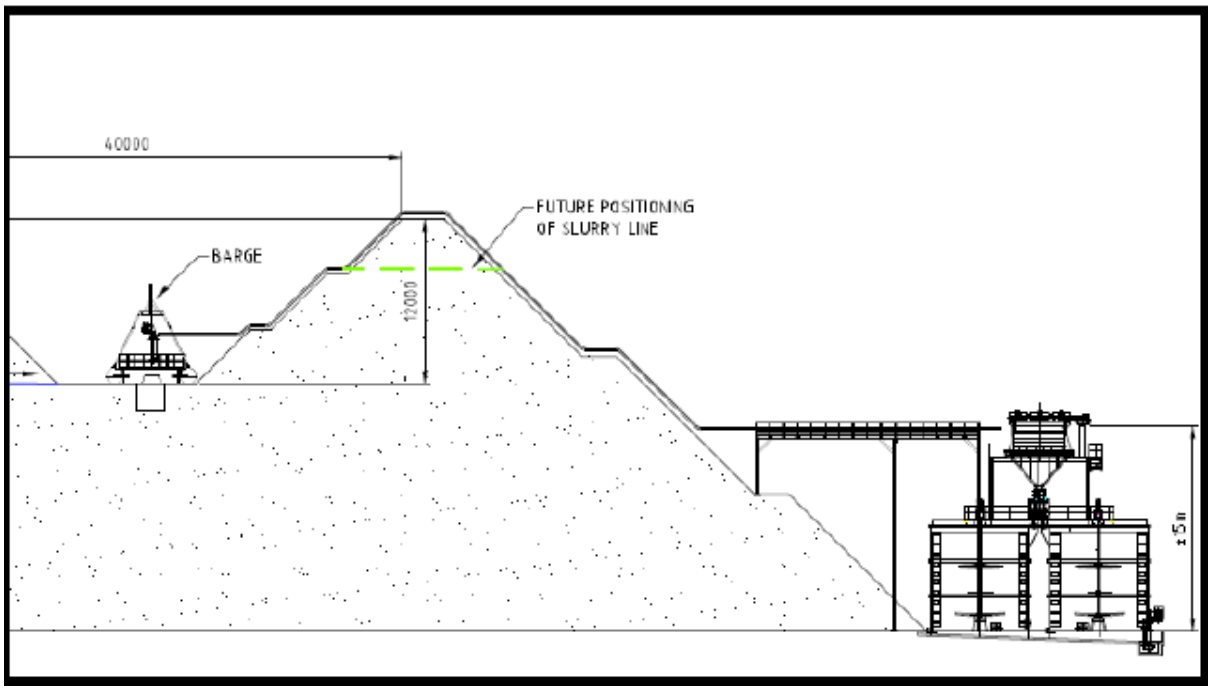
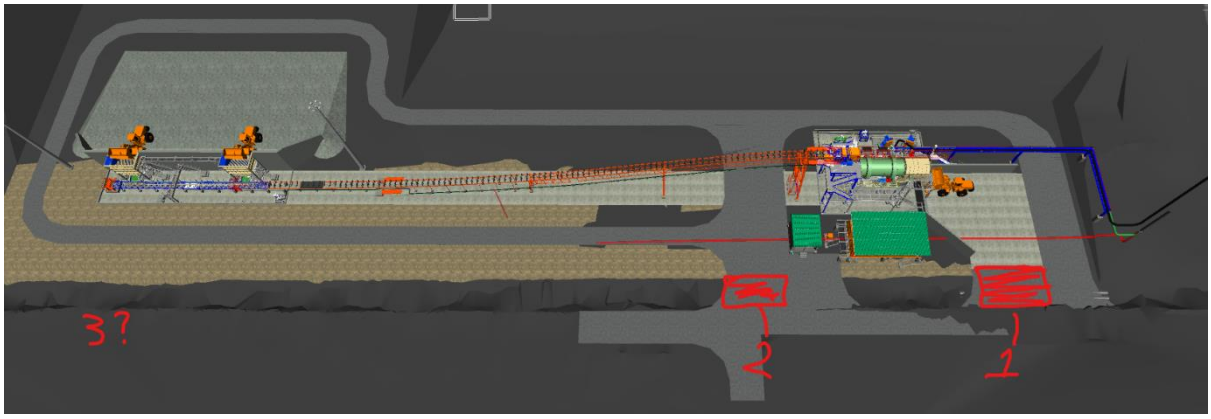


Figure 5: Example of re-mining

5.4.2 Mechanical re-mining:

Once the EPL TD2 is dry enough, Sibanye-Stillwater will revert to mechanical re-mining. This involves loading the tailings material with trucks into bins, and then feed it to EBTT and pump it to BTT.



5.4.3 Rehabilitation:

The EPL TD2 footprint area will be rehabilitated on completion of the re-mining.

5.5 Listed and specified activities applied for

The listed activities associated with the proposed re-mining of EPL TD2 terms of the NEMA EIA Regulations are shown in Table 6.

Table 6: Listed activities triggered by the proposed re-mining of EPL TD2

Name of activity	Aerial extent of the activity	Listed activity	Applicable listing notice
The expansion of a waste management activity listed in Category A or B of this Schedule which does not trigger an additional waste management activity in terms of this Schedule *The EPL TD facility contains two compartments, TD1 and TD2. The remining of EPL TD1 is authorised in the 2012 EMPr and a mining right is in place. The re-mining of EPL TD2 is therefore an expansion of the re-mining of the EPL tailings storage facility.*	129 ha	Category A Activity 13	National Environmental Management: Waste Act (Act No. 59 of 2008) GNR 921

6 Policy and legislative context

Table 7 provides an overview of the policy and legislative context applicable to the project and will be considered during the assessment process.

Table 7: Policy and legislative context

Applicable legislation and guidelines used to compile the report	How does this development comply with and respond to the legislation and policy context
Constitution of the Republic of South Africa (Act No. 108 of 1996) The environmental right is mentioned in Section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996). This states the following: "...everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development". The State must therefore respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities. The Constitution therefore recognises that the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must cooperate with, consult and support one another if the State is to fulfil its constitutional mandate.	The Constitution of South Africa is the overarching framework legislation driving the NEMA principles and therefore the Basic Assessment process. The proposed mitigation and management measures to minimise and prevent negative impacts associated with the project are shown in Table 35 and Table 36. The issuing of an environmental authorisation or other permits or licence for any aspect of the proposed project will ensure that the environmental right enshrined in the Constitution contributes to the protection of the biophysical and socio- economic environment.
National Environmental Management Act (Act No. 107 of 1998) (NEMA) In terms of the section 24(5) read with section 44 of NEMA, Environmental Impact Assessment (EIA) Regulations have been published to provide lists of activities that require environmental authorisation before they may commence. There are three listings, each requiring a different type of environmental authorisation process. • Listing 1: Activities requiring a Basic Assessment process (approximately 197 days) • Listing 2: Activities requiring a Scoping and Environmental Impact Reporting (S&EIR) process (approximately 300 days) • Listing 3: Activities within certain geographic areas requiring a Basic Assessment process (approximately 197 days)	The proposed re-mining of the EPL TD2 does not trigger activities in terms of the NEMA Regulations. The Draft BAR has been compiled in accordance with the requirements of Government Notice R982 dated 4 December 2014 (as updated), Section 3 of Appendix 1. Refer to Table 1.

Applicable legislation and guidelines used to compile the report	How does this development comply with and respond to the legislation and policy context
National Environmental Management: Waste Act (Act No.59 of 2008) (NEM:WA) NEMWA aims to provide regulation for waste management in order to protect health and the environment, for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. NEM:WA has three categories of activities that require environmental authorisation. Category A: Activities requiring a Basic Assessment process Category B: Activities requiring a S&EIR process Category C: Activities that do not require an environmental authorisation process, but need adhere to the required Norms and Standards.	The proposed re-mining of EPL TD2 triggers a Category A activity in terms of NEM:WA Regulations. Refer to Table 6.
National Heritage Resources Act (Act No. 25 of 1999) (NHRA) The objective of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is to introduce an integrated system for the management of national heritage resources. The identification, evaluation and assessment of any cultural heritage site, artefact or find in South Africa is required by this Act.	The project area is completely transformed through the establishment of the existing tailings dam complex, and the study area is considered to be of low heritage potential. This was confirmed during the site visit, and no evidence of heritage resources was noted. An application for exemption from a Phase 1 Heritage Impact is therefore supported for the project due to the lack of heritage resources and the extent of the transformation of the area. Refer to Part A Section 10.11 and Appendix C7.
National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEM:AQA) According to the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA) the Department of Forestry Fisheries and the Environment (DFFE), the provincial environmental departments and local authorities (district and local municipalities) are separately and jointly responsible for the implementation and enforcement of various aspects of NEM: AQA. A fundamental aspect of the approach to the air quality regulation, as reflected in the NEM: AQA is the establishment of National Ambient Air Quality Standards (NAAQS). These standards provide the goals for air quality management plans and also provide the benchmark by which the effectiveness of these management plans is measured.	An Air Emissions Licence will not be required, as no Atmospheric Emissions listed activities are triggered by the proposed re-mining of the EPL TD2.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA)	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM:BA) provides for the management

Applicable legislation and guidelines used to compile the report	How does this development comply with and respond to the legislation and policy context
The National Environmental Biodiversity Act, Act 10 of 2004 (NEMBA) provides for the management and conservation of South Africa's biodiversity within the framework of the NEMA. The Act relates to the protection of species and ecosystems that warrant national protection, among others	and conservation of South Africa's biodiversity within the framework of NEMA, as well as the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources. The proposed project area overlaps with the Marikana Thornveld 'Endangered' ecosystem.
The National Environmental Management: Protected Areas Act (Act No. 57 of 2003) (NEM:PAA) The NEM:PAA ensures the protection and conservation of ecologically viable areas characteristic of South Africa's biological diversity and its natural areas in order to create a national register of all national, provincial and local protected areas.	The proposed project area does not fall within a protected area.
National Water Act (Act No. 36 of 1998) (NWA) NWA makes provision for water resource management, protection of the quality of water resources and recognising the need for the integrated management of all aspects of water resources to achieve sustainable use of water.	The Marikana Operations has an existing Water Use Licence (WUL) that comprises water uses at both WPL and EPL. Licence Number 01/A21K/ABCEFGIHJ/4620, issued on 22 February 2019. The EPL TD2 is authorised as Section 21 (g) water use (disposing of waste in a manner which may detrimentally impact on a water resource) in terms of the National Water Act (Act No. 36 of 1998). The description of the activity includes disposal of tailings onto the EPL Tailings Dam 2 for disposal (storage), re-use or retreatment. The wetland assessment confirmed that a depression wetland is located within 500m of EPL TD2. A GN509 risk assessment was undertaken for the project and resulted in a "Low" risk rating for the activities proposed. Therefore, a General Authorisation application in terms of the NWA will be required.
Mine Health and Safety Act (Act No. 29 of 1996) (MHSA) The Mine Health and Safety Act (Act No. 29 of 1996) (MHSA) aims to provide for protection of the health and safety of all employees and other personnel at the mines of South Africa. The purpose is to promote a culture of health and safety; to provide for the enforcement of health and safety measures.	The applicant must ensure compliance to all requirements of the MHSA for the duration of the project.

7 Need and desirability of the proposed activities

The outlook to 2021 sees global platinum supply increase from 5.85Moz to 6Moz (+2.5%). Nonetheless, over the long term the supply total is set to remain below 6Moz though with end-of-life production areas partly offsetting expansion projects. The demand for Platinum is continuously growing as platinum is widely used in electrical components, electrodes, dentistry equipment, catalytic converters, laboratory equipment, chemotherapy, resistance thermometers and jewellery. Looking ahead to the middle of the next decade platinum demand in auto-catalysts is forecasted to dip by 2021 (mainly owing to steadily declining demand in Europe), but will begin to recover thereafter by 2024 as emerging market demand grows, particularly in commercial vehicles as tailpipe emissions standards tighten. Over the long term, platinum jewellery demand could steadily recover by 2025. Industrial demand for platinum fluctuates significantly most years depending on the timing of capacity builds and closures for the manufacture of glass products, oil refineries and chemical plants.

The overall objective of this project is to recover residual PGMs from tailings within the existing EPL TD2. The resultant tailings from the reprocessing plant will be deposited at Marikana Mine's TD6. This will allow for the rehabilitation and clearance of land currently occupied by the EPL TD2.

The re-mining of EPL TD2 will be an extension of the already operating concentrator. The advantage is businesses that are currently providing a service from the host communities will continue to have business subject to performance and contractual agreements etc. If the extension to re-mine EPL TD2 does not happen, it would mean the BTT/EBTT operations will come to a halt by end of 2024 which would result in 200 job losses (contractors and permanent employees).

8 Motivation for the overall preferred site, activities and technology alternatives including a full description of the process followed to reach the preferred alternatives within site

NEMA prescribes that every application for environmental authorisation must include an investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity (i.e. the No-Go Alternative). Alternatives, in relation to a proposed activity, are different ways of meeting the general purposes and requirements of the proposed activity, which may include alternatives to:

- The property on which or location where it is proposed to undertake the activity;
- The type of activity to be undertaken;
- The design or layout of the activity;
- The technology to be used in the activity; and
- The option of not implementing the activity.

This section presents the various alternatives considered in this Draft BAR.

8.1 Property or location alternatives

No alternatives have been investigated in terms of property or location of the proposed project. The EPL TD2 is an existing tailing storage facility on the farm Turffontein 462 JQ Portion 3 within the Sibanye Stillwater EPL mining right area.

8.2 Type of activity to be undertaken

The only optional activity for Sibanye-Stillwater is to re-mine and process the remaining PGMs in the existing EPL TD2. Advantages and disadvantages are shown in

Table 8: Advantages and disadvantages of re-mining the EPL TD2

Option	Advantage	Disadvantage
Re-mining and reprocessing of the EPL TD2 (preferred)	• Low-technical-risk nature of tailings retreatment projects sets them apart from traditional underground and opencast operations • Not labour intensive. • Less safety issues. • Easy access to surface tailings, as well as lower labour and operating costs. • Boost to local economy. • Removal of pollution source after rehabilitation and cessation of project	• Potential profits rely on substantial volumes of material. • Potential negative environmental effects during construction and operational phase of the project.

8.3 Design and layout of the activity

The current layout plan for the proposed re-mining of the EPL TD2 is considered the preferred layout plan. The layout plan is dictated by the existing location of the EPL TD2 and its associated infrastructure.

Exiting pipelines and treatment plants will be used for the re-mining and reprocessing of tailings material from EPL TD2.

8.4 Technology to be used in the activity

The treatment plants for the re-treatment of tailings material are existing (EBBT and BBT), therefore no alternatives in terms of technology has been considered for this project.

8.5 No-go option

The no-go option, where the project does not proceed would entail the environmental impact and social status would remain the same as it is currently. This implies that both negative and positive impacts would not take place.

As a result, negative impacts on biodiversity, water resources, air quality, land use etc. would continue and also that the positive impacts such as mine residue removals, land rehabilitation would not occur.

The 'No Project' alternative is not yet considered due to the anticipated benefits of the proposed reclamation project. The expected indirect benefits of the Proposed Project include:

- Removal of the EPL TD2 as a source of pollution in the area;
- Continued supply of platinum to the local and national markets, and therefore contribution to local, provincial and national economy.

9 Details of the Public Participation Process followed

9.1 Objectives of public participation

The objectives of the public participation process are as follows:

- To introduce the proposed project to identified stakeholders/Interested and Affected Parties (I&APs) and to inform them of the environmental authorisation process to be followed;
- To provide sufficient and accessible information to identified stakeholders/I&APs; and
- To provide stakeholders/I&APs opportunities to provide comment, raise concerns or provide suggestions for enhanced benefits.

9.2 Public Participation Process

A public participation process has been undertaken in support of the basic assessment environmental authorisation process, inclusive of site notices, newspaper advertisements, background information letter and making the Draft BAR available for public comment.

A summary of the public participation process undertaken to date is provided in Table 9 below .

Table 9: Summary of the Public Participation Process

Activity	Description
Pre-application phase	
Identification of stakeholders	The following stakeholders were identified: • North West Department of Mineral Resources and Energy (DMRE); • Department of Water and Sanitation (DWS) • North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDECT) • North West Department of Rural Development and Land Reform • North West Provincial Heritage Resources Agency • South African Heritage Resources Agency • Bojanala Platinum District Municipality • Madibeng Local Municipality • South African National Roads Agency (SANRAL) • Bapo ba Mogale Refer to Appendix B1 for a list of stakeholders.
Pre-application meeting	Pre-application meetings were held with the following entities: • North West DMRE (competent authority) • Ward Councillor of Ward 40 Refer to Appendix B2 for minutes of the meetings.
Site Notices	Site notices (in English) were placed around the EPL Tailings Dam Complex. Refer to Appendix B3. The site notice provided a brief introduction to the project, information on the proposed project and details on how to register as an Interested and Affected Party (I&AP).
Background Information Letter	A Background Information Letter (BIL) was distributed via email to identified stakeholders. A copy of the BIL is provided in Appendix B4. Proof of distribution is available in Appendix B5.

Activity	Description
	The BIL included an introduction to the project, information on the proposed activities, details of the process to be followed, details of the public participation process and an invitation to register as an Interested and Affected Party.
Basic Assessment Phase	
Newspaper Advertisement	A newspaper advertisement was placed in the Brits Pos in English on 19 October 2023. Refer to Appendix B6 for a copy of the advertisement. The newspaper advertisement contained a brief introduction to the project, the availability of the Draft BAR for public comment, details of public participation process and a request to register as an Interested and Affected Party.
Notification Letter	A notification letter was distributed to inform registered stakeholders about the availability of the Draft BAR for public comment. A copy of the notification letter is available in Appendix B7. Proof of distribution is available in Appendix B8.In addition, sms notifications were also sent out. Refer to Appendix B9.
Availability of Draft BAR for public comment	The Draft BAR is currently available for public comment for 30 calendar days from 20 October to 20 November 2023. The Draft BAR is available for public comment at the following location: • Madibeng Library In addition, the Draft BAR is available electronically on the Ulwazi Data Free Platform (https://ulwazi.datafree.co/) and AVDE website: https://www.altavandykenvironmental.co.za/public-documents/.
Decision making phase	
Notification letter	A notification letter will be distributed to all registered stakeholders informing them of the decision made by the DMRE. The notification letter will provide details on the appeal process and the associated timeframes, should thy wish to appeal the decision.

9.3 Legal requirements for public participation

Table 10 provides a review of the legal requirements for public participation in terms of the NEMA EIA Regulations.

Table 10: Legal requirements for public participation

NEMA Regulation	Public Participation Regulation	Process followed
Regulation 39. Activity on land owned by person other than proponent		
39 (1)	If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.	The landowner of Turffontein 462 JQ Portion 3 is the Government of the Republic of South Africa, administered by the Bapo ba Mogale. Members of the Bapo ba Mogale were informed of the proposed re-mining of EPL TD2. Refer to Appendix B5.
39 (2)	Subregulation (1) does not apply in respect of— (a) linear activities; and	Not applicable

NEMA Regulation	Public Participation Regulation	Process followed
	(c) strategic integrated projects as contemplated in the Infrastructure Development Act, 2014.	
Regulation 40. Purpose of public participation		
40(1)	The public participation process to which the- (a) basic assessment report and EMPr, and the closure plan, in the case of a closure activity, submitted in terms of regulation 19; and (b) scoping report submitted in terms of regulation 21, the environmental impact assessment report, EMPr and the closure plan in the case of a closure activity, submitted in terms of regulation 23; was subjected to must give all potential or registered interested and affected parties, including the competent authority, a period of at least 30 days to submit comments on each of the basic assessment report EMPr, scoping report and environmental impact assessment report, and the closure plan in the case of a closure activity, as well as the report contemplated in regulation 32, if such reports or plans are submitted at different times.	The Draft BAR is currently available for public comment for a period of 30 days, from 20 October to 20 November 2023.
40(2)	The public participation process contemplated in this regulation must provide access to all information that reasonably has or may have the potential to influence any decision with regard to an application unless access to that information is protected by law and must include consultation with- (a) the competent authority; (b) every State department that administers a law relating to a matter affecting the environment relevant to an application for an environmental authorisation (c) all organs of state which have jurisdiction in respect of the activity to which the application relate; and all potential , or where relevant, registered interested and affected parties.	The Draft BAR is currently available for public comment for a period of 30 days, from 20 October to 20 November 2023. Refer to Appendix B1 for a list of stakeholders consulted during the environmental authorisation process.

NEMA Regulation	Public Participation Regulation	Process followed
40(3)	Potential or registered interested and affected parties, including the competent authority, may be provided with an opportunity to comment on reports and plans contemplated in subregulation (1) prior to submission of an application but must provided with an opportunity to comment on such reports once an application has been submitted to the competent authority.	Not applicable as the application form was submitted to the DMRE on 19 October 2023. The Draft BAR is currently available for public comment from 20 October to 20 November 2023.
41 (2) (a)	Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of— (i) the site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) any alternative site;	A2 notice boards were placed around the EPL Tailings Dam Complex, as part of pre-application phase. Refer to Appendix B3 for proof of site notices.
41 (2) (b)	Giving writing notice to	
(i)	The occupiers of the site	The EPL Tailings Complex is an existing facility. There are no occupiers.
(ii)	Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken	
(iii)	The municipal councillor of the ward	A pre-application meeting was held with to Cllr C Mphahlele who is the Councillor for Ward 40. Refer to Appendix B2.
(iv)	The municipality which has jurisdiction in the area	A BIL was emailed to several members of the Madibeng Local Municipality and Bojanala Platinum District Municipality. Refer to Appendix B1 for the list of stakeholders and Appendix B5 for distribution of BILs.
(v)	Organ of state having jurisdiction in respect of any aspect of the activity	BILs were distributed via email to the following authorities: • North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDECT); • Department of Water and Sanitation (DWS); • Department of Agriculture; • Madibeng Local Municipality; • Bojanala Platinum District Municipality. • South African National Roads Agency (SANRAL) The Draft BAR was uploaded onto the South African Heritage Resources Information System (SAHRIS) website for comment from the South African Heritage Resources Agency (SAHRA).

NEMA Regulation	Public Participation Regulation	Process followed
		Refer to Appendix B1 and B5.
(vi)	Any other party as required by the competent authority	None required to date.
41 (2) (c)	Placing an advertisement in one local newspaper	A newspaper advertisement was placed in the Brits Pos in English on 19 October 2023. Refer to Appendix B6 for a copy of the advertisement.
41 (2) (d)	Placing an advertisement in at least one provincial or national newspaper, if the activity may have an impact that extends beyond the boundaries of the metropolitan or district municipality.	Not applicable. The activity does not have an impact that extends beyond the boundaries of the metropolitan.
41 (2) (e)	Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to- (i) illiteracy; (ii) disability; or (iii) any other disadvantage	None required to date.
41 (3)	A notice, notice board or advertisement must: (a) give details of the application or proposed application which is subjected to public participation; and (b) state: (i) whether a basic assessment or S&EIR procedures are being applied to the application (ii) the nature and location of the activity to which the application relates (iii) where further information on the application can be obtained the manner in which and the person to whom representations in respect of the application or proposed application may be made	A2 notice boards were placed around the EPL Tailings Dam Complex, as part of pre-application phase. Refer to Appendix B3 for proof of site notices.

9.4 Summary of comments received by I&APs

All comments received from I&APs are included in Table 11.

Table 11: Comments raised to date by I&APs during the stakeholder engagement process

Interested and affected party	Date comments received	Comment raised	EAP's response to comments as mandated by the applicant	Consultation status
Desmond Makamu Department of Mineral Resources and Energy (DMRE)	07 February 2023 Minutes of meeting	Is Sibanye-Stillwater currently re-mining at EPL?	Sibanye-Stillwater is currently re-mining TD1. A layer of 0,5 m of tailings material will be left on the existing barrier, before planned re-deposition of tailings material will take place. The re-deposition does not form part of this application.	Completed
Desmond Makamu Department of Mineral Resources and Energy (DMRE)	07 February 2023 Minutes of meeting	Is the current footprint of TD1 flat?	The TD1 area is not flat yet. Approximately a year to a year of re-mining of TD1 is left, if re-mining will take place up to the ground level would take place.	Completed
Desmond Makamu Department of Mineral Resources and Energy (DMRE)	07 February 2023 Minutes of meeting	Is authorisation in terms of the National Water Act required? This will be taken into consideration when determining the environmental authorisations required.	The Marikana Operations has an existing Water Use Licence (WUL) that comprises water uses at both WPL and EPL. Licence Number 01/A21K/ABCEFGIHJ/4620, issued on 22 February 2019. The EPL TD2 is authorised as Section 21 (g) water use (disposing of waste in a manner which may detrimentally impact on a water resource) in terms of the National Water Act (Act No. 36 of 1998). The description of the activity includes disposal of tailings onto the EPL Tailings Dam 2 for disposal (storage), re-use or retreatment. The wetland assessment confirmed that a depression wetland is located within 500m of EPL TD2. A GN509 risk assessment was undertaken for the project and resulted in a	Completed

Interested and affected party	Date comments received	Comment raised	EAP's response to comments as mandated by the applicant	Consultation status
			"Low" risk rating for the activities proposed. Therefore, a General Authorisation application in terms of the NWA will be required.	
Desmond Makamu Department of Mineral Resources and Energy (DMRE)	07 February 2023 Minutes of meeting	Financial provisioning will need to be considered.	Refer to Part A Section 20 and Appendix E for the financial provisioning.	Completed
Desmond Makamu Department of Mineral Resources and Energy (DMRE)	07 February 2023 Minutes of meeting	Is authorisation for the project only needed from the DMRE?	It was confirmed that environmental authorisation in terms of EMA is required for the proposed project, as well as a General Authorisation in terms of the NWA from the DWS.	Completed
Ria Barkhuizen South African National Roads Agency SOC Ltd (SANRAL)	18 July 2023 Letter/email	The South African National Roads Agency SOC Ltd (SANRAL) has no objection to the application as no national roads or interchanges under the jurisdiction of SANRAL will be affected.	The comment is noted.	Completed
Cllr Mphahlele Ward Councillor for Ward 40 Madibeng Local Municipality	30 August 2023 Minutes of meeting	Is chrome also extracted as part of the tailings re-treatment?	Only Platinum Group Metals are extracted during tailings re-treatment	Completed
Cllr Mphahlele Ward Councillor for Ward 40 Madibeng Local Municipality	30 August 2023 Minutes of meeting	How will the project affected Air Quality, as there is a community to the north east of the TD2?	An Air Quality Study was undertaken, and the predicted dust deposition is low and well below the limit value for acceptable dust fallout in in residential areas. The predicted PM_{10} and $PM_{2.5}$ concentrations are low and	Completed

Interested and affected party	Date comments received	Comment raised	EAP's response to comments as mandated by the applicant	Consultation status
			well below the respective NAAAQS through the surrounding environmental and nearby residential areas. Refer to Part A Section 11.7.3, Table 35 and Table 36 as well as Appendix C1 for the Air Quality Assessment.	
Cllr Mphahlele Ward Councillor for Ward 40 Madibeng Local Municipality	30 August 2023 Minutes of meeting	What business opportunities will be created as part of the re-mining of TD2, and what is the procurement procedures of Sibanye-Stillwater.	The proposed re-mining of EPL TD2 will be an extension of the already operating concentrator. Therefore, businesses that are currently providing a service from the host communities will continue to have business subject to performance and contractual agreements. If the extension to re-mine EPL TD2 does not happen, it would mean the BTT/EBTT operations will come to a halt by end of 2024 which would result in 200 job losses (contractors & permanent employees). Supply chain can assist with the procurement procedure. Sibanye-Stillwater's recruitment procedure is aligned to giving preference to local applicants, as and when there are opportunities, the same procedure will be followed.	Completed

10 The environmental attributes associated with the site

The following chapter presents an overview of the biophysical and socio-economic environment in which the proposed project is located.

10.1 Climate

Information for this section was obtained from the Air Quality Specialist Study for the proposed re-mining of Tailings Dam 2 at the Sibanye-Stillwater Eastern Platinum Mine (uMoya, 2023). Refer to Appendix C1.

The predominant factors that influence the climate of a location are latitude, elevation and the distance from the ocean. Latitude relates to the amount of radiation that is received with lower latitudes receiving more than high latitudes. Temperature decreases with increasing height hence the climate relationship to elevation. The ocean has a moderating effect on temperature range and coastal areas are cooler and generally wetter than inland areas. Other factors that influence climate are topography and local winds. The EPL is situated at approximately 1 170 m above sea level and at a latitude of 25˚69' S. The area experiences a humid subtropical climate with hot summers with the average summer maximum temperatures exceeding 29˚C from November to February (Table 12). The winter temperatures are mild and nights are cold with the average minimum temperature below 10˚C from May to September. The Rustenburg area receives an annual average rainfall of 663 mm with more than 550 mm falling in summer between November and March (Table 12).

Table 12: Average monthly temperatures and rainfall at Rustenburg (Rustenburg Local Municipality, 2007)

Month	Monthly average			
	Maximum (°C)	Daily mean (°C)	Minimum (°C)	Rainfall (mm)
Jan	30.3	23.8	17.1	117
Feb	29.4	23.1	16.8	100
Mar	28.3	21.7	15.0	95
Apr	25.5	18.3	11.2	37
May	21.6	14.9	6.5	18
Jun	20.4	11.8	3.2	9
Jul	20.9	11.8	2.8	7
Aug	23.7	14.4	5.1	8
Sep	27.3	18.5	9.6	18
Oct	28.7	20.8	12.9	55
Nov	29.4	22.1	14.9	86
Dec	30.1	23.1	16.1	113
Annual average	**26.5**	**18.7**	**10.9**	**663**

The Rustenburg Municipality runs a meteorological monitoring station at Marikana. The Marikana Monitoring Station is located 12 km to the west-southwest of the EPL. Due to the close proximity of this station, winds at Marikana are considered representative of winds at the mine. The wind rose for the Marikana Monitoring Station is presented in Figure 6, using hourly wind speed and wind direction data.

The wind rose illustrates the frequency of hourly wind from the 16 cardinal wind directions, with wind indicated from the direction it blows, i.e., easterly winds blow from the east. It also illustrates the frequency of average hourly wind speed in six wind speed classes. Wind speed is given in meters per second (m/s), and each arc

represents a percentage frequency of occurrence (3% in this case). The wind rose was plotted using WRPlot View, a Lakes Environmental Software.

The winds at Marikana are predominantly from the north, accounting for just over 12% of all winds. A relatively high frequency of wind also occurs from the west to north-northwesterly sectors and south to southwesterly sectors, accounting for another 45% of all winds. It is noted that light to gentle winds prevail in the area, and don't usually exceed 5.7 m/s.

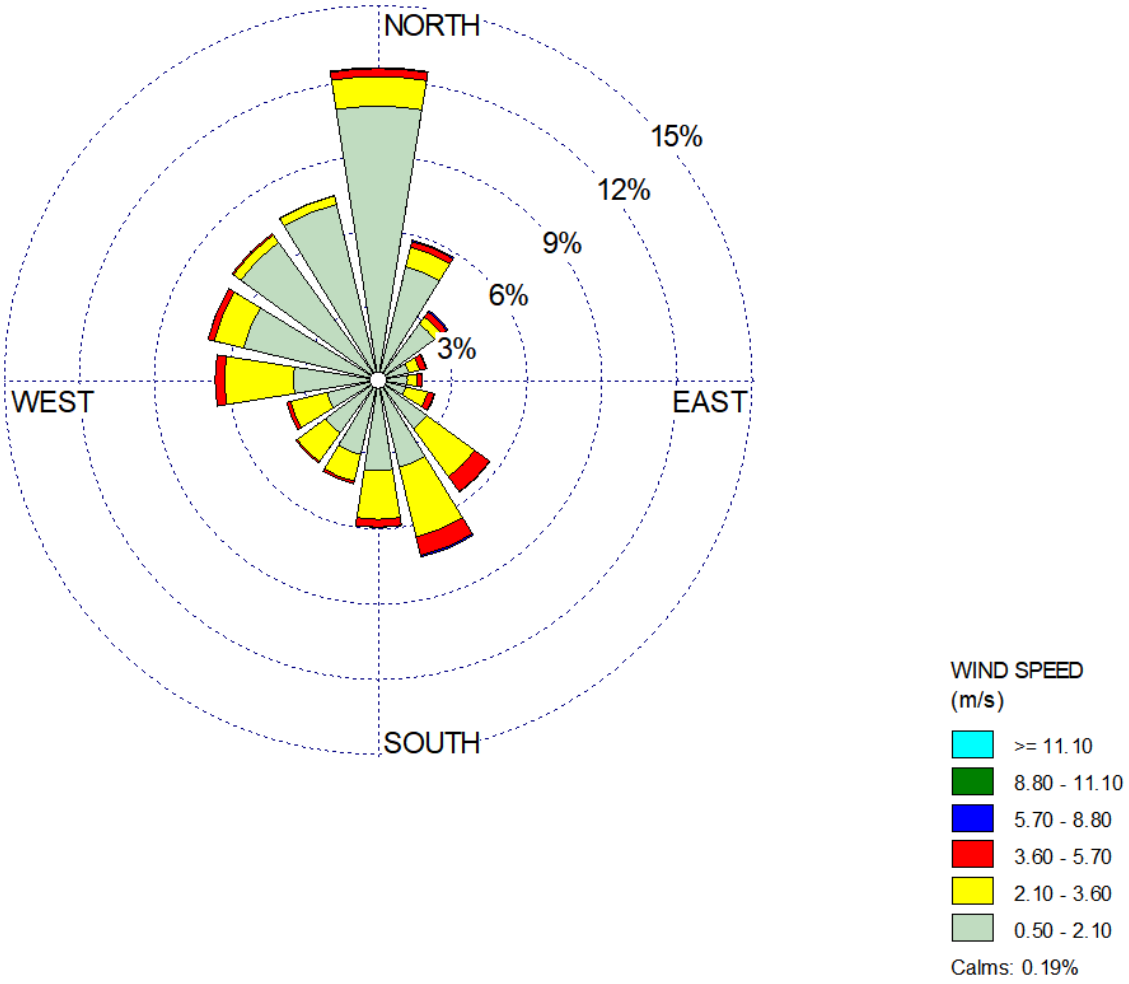


Figure 6: Annual Wind rose of hourly wind data for the Marikana Monitoring Station (data sourced from the, SAAQIS, 2023)

10.2 Geology

The Rustenburg Layered Suite comprises of rock types ranging from dunite and pyroxenite through norite, gabbro and anorthosite to magnetite- and apatite-rich diorite, and so demonstrates a complete differentiation sequence for a basic magma. The western limb extends for 200 km along an arc from near Thabazimbi to near Pretoria (Johnson et al., 2006: 261 – 267).

The Bushveld Igneous Complex formed in three stages: rhyolite eruptions on a floor consisting of mainly Transvaal Supergroup sedimentary rocks produced the Rooiberg Group; immediately after the eruption of the lavas, basaltic magma then intruded below the Rooiberg Group, forming a layer of about 8 km thick, which crystallized very slowly, allowing minerals to segregate into layers to form the Rustenburg Layered Suite; finally,

the amount of heat liberated as the basaltic magma flowed through the base of the crust from the mantle caused heating and melting of the deeper parts of the crust eventually allowing further intrusions, ponding of granite magma directly above the Rustenburg Layered Suite but below the Rooiberg Group rocks (Water Hunters, 2020).

10.3 Soils

Information for this section was obtained from the Agricultural Compliance Statement for the proposed Retreatment of Eastern Platinum (Pty) Ltd (EPL) Tailings Dam 2 (TBC1, 2023). Refer to Appendix C2.

10.3.1 Baseline findings

The most sensitive soil form which was identified in the project area is that of Arcadia soil form. The Arcadia soil form consists of a vertic topsoil horizon on top of a lithic horizon below. Other associated fewer sensitive soils identified in the project area includes the Rustenburg and Witbank soil forms (see Figure 7 to Figure 9). The Witbank soil form, which is the most dominant soil form in the area (Figure 10) is man-made anthropogenic open excavated or underground transported Technosols. The project area is dominated by vertic soils, which are characterised with high clays, swelling and shrinking (see Figure 8). These soils are usually hard to work with for most activities.

The above-mentioned most sensitive soil forms have been determined to have a land capacity class of “III” and “IV” (see Figure 11) with a climate capacity level 8 given the Low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates. The combination between the determined land capability class and climate capability results in land potential “L6”. The “L6” land potential level is characterised by very restricted potential due to the severe limitations as a result of the soil, slope, temperature, or rainfall. This area is non-arable, and it is characterised with a “Low to Medium” sensitivity.

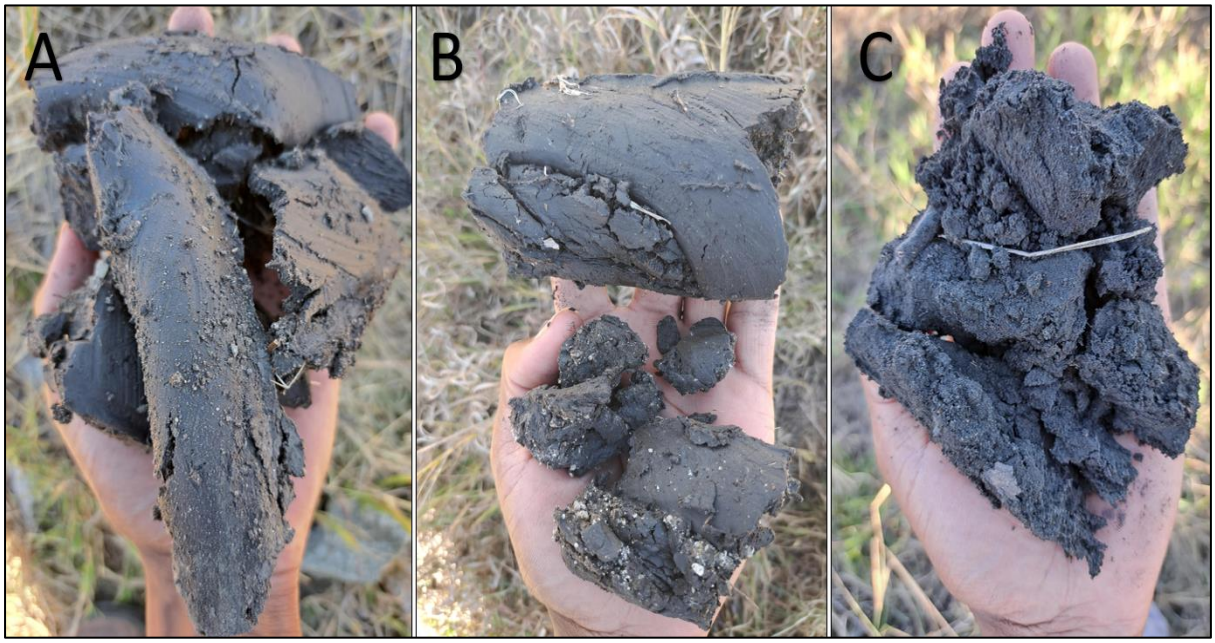


Figure 7: Soil forms found within the proposed project area; A) Vertic topsoil horizon; B) Lithic subsurface horizon C) Witbank soil form (TBC1, 2023)

Figure 8: Vertic topsoil swelling and shrinking which causes self-plough or cracking (TBC1, 2023)

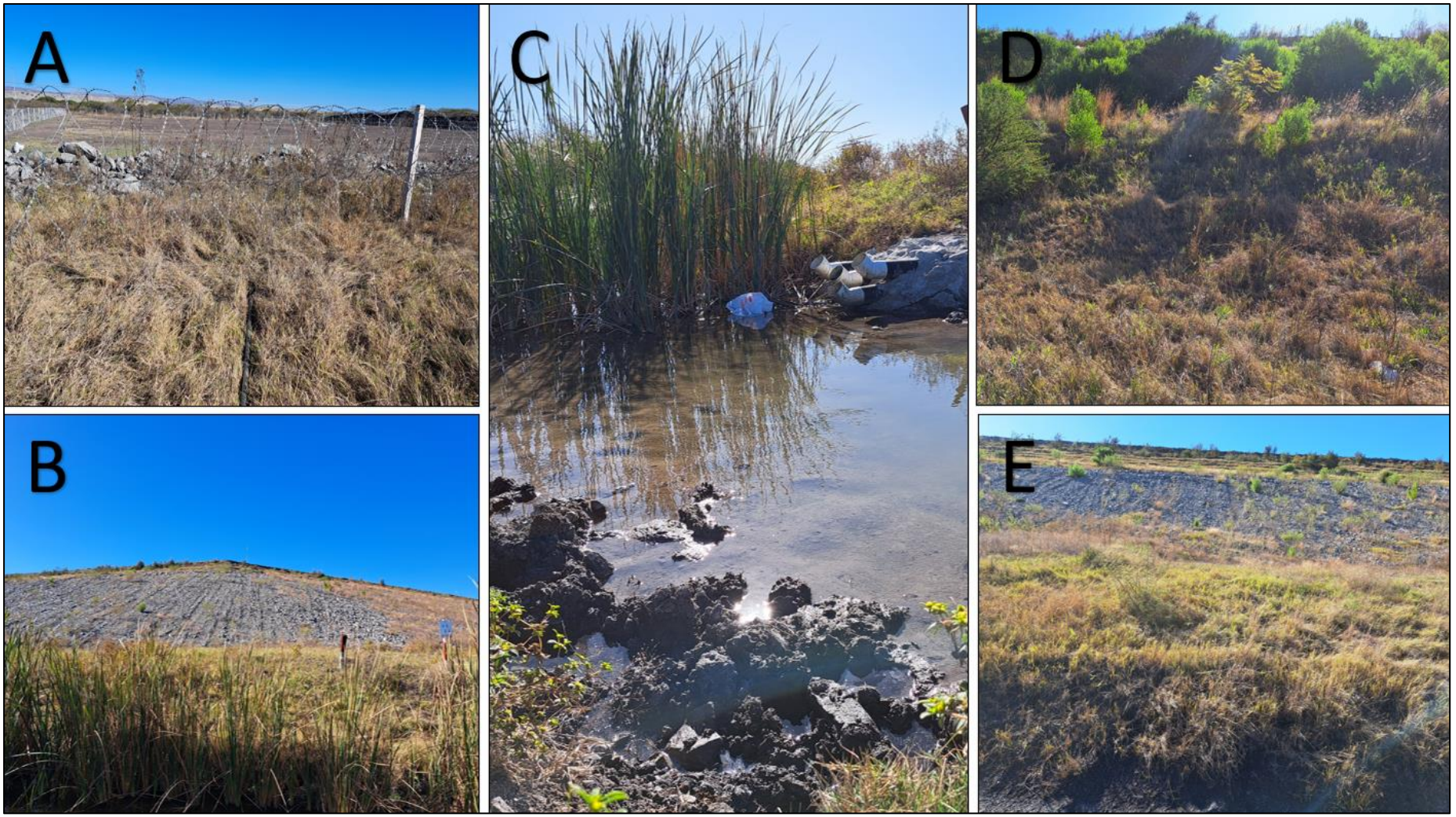


Figure 9: A-D - General landscape of the project area with the identified soil forms (TBC1, 2023)

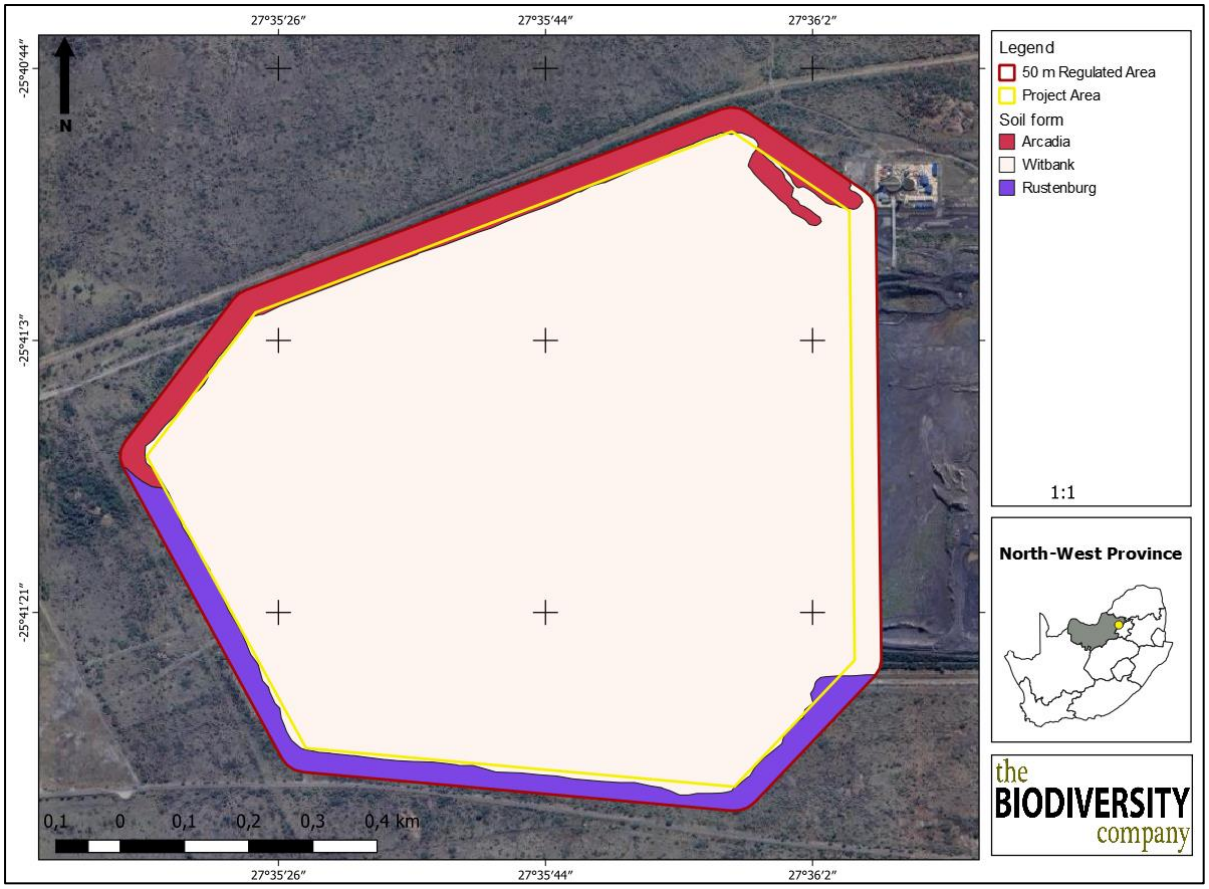


Figure 10: Dominant soil forms distribution identified in the project area (TBC1, 2023)

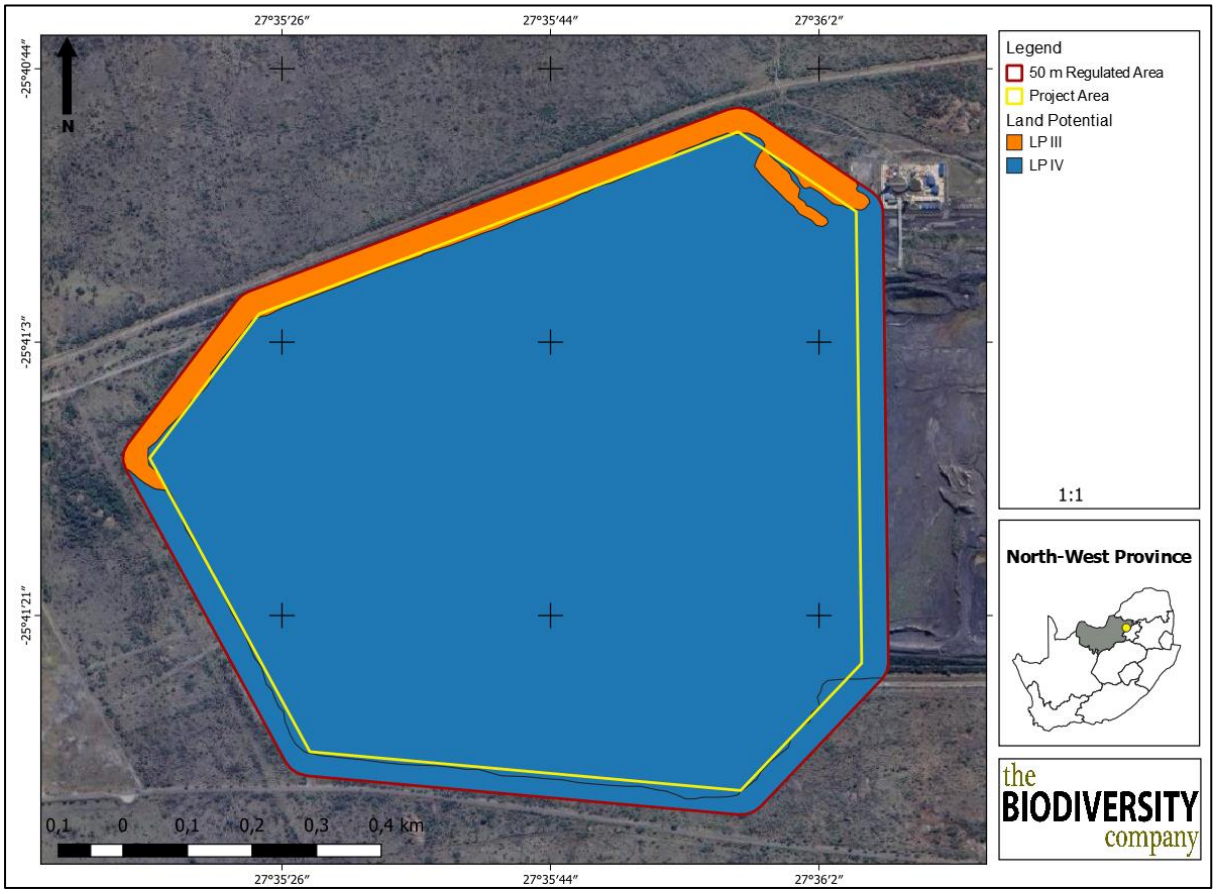


Figure 11: Land Potential of the soils forms identified in the project area (TBC1, 2023)

10.3.2 Sensitivity verification

The following land potential level has been determined;

- Land potential level 6 (this land potential is characterised by a very restricted land potential. Severe limitations due to soil, slope, temperatures, or rainfall. Non arable).

Fifteen land capabilities have been digitised by (DAFF, 2017) across South Africa, of which two potential land capability classes are located within the proposed footprint area's assessment corridor, including;

- Land Capability 6 to 8 (Low to Moderate Sensitivity).

The baseline findings and the Land Capability sensitivity as per the Department of Agricultural, Forestry and Fisheries (DAFF, 2017) national raster file concur with one another in some areas around the TSF. The proposed project area is characterised with "Low to Moderate" land capability sensitivity (DFFE screening tool, 2023;). The verified soil baseline findings disagree with most areas which were identified as "Moderate" sensitivity associated with the Witbank soil forms. These soils are usually characterised with transported excavated material with a significantly limited land potential and capability due to the presence of course parent material from the mining operations. The available harsh climatic conditions also restrict most cropping practices, thus overall, the area can be categorized as "Low" sensitivity which meets the requirements of an agricultural compliance statement only.

10.4 Biodiversity

Information for this section was obtained from the Terrestrial Vegetation Compliance Statement for the proposed Retreatment of Eastern Platinum (Pty) Ltd (EPL) Tailings Dam 2 (TBC2, 2023). Refer to Appendix C3.

Table 13 was produced as a result of the spatial data collected and analysed (as provided by various sources such as the national and provincial environmental authorities and South African National Biodiversity Institute (SANBI)). It presents a summative breakdown of the ecological boundaries considered and the associated relevance that each has to the region or project area. Where a feature is regarded as relevant it is considered an ecologically important landscape feature and discussed further as part of the sub-sections that follow.

Table 13 Summary of the spatial relevance of the project area to local ecologically important landscape features (TBC2, 2023)

Desktop Information Considered	Relevance	Reasoning
The Northwest Biodiversity Sector Plan 2015 - Provincial Conservation Plan	Yes	The project area mainly overlaps with areas classified as Ecological Support Area 1 (ESA1).
NBA 2018: Ecosystem Threat Status	Yes	Project area overlaps with the Marikana Thornveld 'Endangered' ecosystem.
NBA 2018: Ecosystem Protection Level	Yes	Project area overlaps with the Marikana Thornveld 'Poorly Protected' ecosystem.
Protected and Conservation Areas (South Africa Protected Areas Database (SAPAD) & South Africa Conservation Areas Database (SACAD))	Yes	The project area overlaps with the Magaliesberg Biosphere Reserve transition area.
National Protected Areas Expansion Strategy (NPAES)	Yes	The project area marginally overlaps with a Priority Focus Area .

Desktop Information Considered	Relevance	Reasoning
Strategic Water Source Areas (SWSA)	No	The project area does not overlap with a SWSA .
National Freshwater Ecosystem Priority Areas (NFEPA)	No	No NFEPA systems occur within 500 m of the project area.
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	No	No systems occur within 500 m of the project area .
Vegetation Type	Yes	Marikana Thornveld.

10.4.1 Vegetation

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

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

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

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

On a fine-scale vegetation type, the project area overlaps with the **Marikana Thornveld** vegetation type.

The **Marikana Thornveld** consists of open *Vachellia karroo* woodland, occurring in valleys and slightly undulating plains, and some lowland hills. Shrubs are denser along drainage lines, on termitaria and rocky outcrops or in other habitats protected from fire (Mucina & Rutherford, 2006). Marikana Thornveld occurs on plains from the Rustenburg area in the west, through Marikana and Brits to the Pretoria area in the East (Mucina & Rutherford, 2006).

Tall Trees: *Senegalia burkei* (Mucina & Rutherford, 2006).

Small Trees: *Senegalia caffra, S. gerrardii, V. karroo, Combretum molle, Searsia lancea, Ziziphus mucronata, V. nilotica, V. tortilis subsp. heteracantha, Celtis africana, Dombeya rotundifolia, Pappea capensis, Peltophorum africanum, Terminalia sericea* (Mucina & Rutherford, 2006).

Tall Shrubs: *Euclea crispa subsp. crispa, Olea europaea subsp. africana, Searsia pyroides var. pyroides, Diospyros lycioides subsp. guerkei, Ehretia rigida subsp. rigida, Euclea undulata, Grewia flava, Pavetta gardeniifolia* (Mucina & Rutherford, 2006).

Low Shrubs: *Asparagus cooperi, Rhynchosia nitens, Indigofera zeyheri, Justicia flava.*

Woody Climbers: *Clematis brachiata, Helinus integrifolius* (Mucina & Rutherford, 2006).

Herbaceous Climbers: *Pentarrhinum insipidum, Cyphostemma cirrhosum.*

Graminoids: *Elionurus muticus, Eragrostis lehmanniana, Setaria sphacelata, Themeda triandra, Aristida scabrivalvis subsp. scabrivalvis, Fingerhuthia africana, Heteropogon contortus, Hyperthelia dissoluta, Melinis nerviglumis, Pogonarthria squarrosa.*

Herbs: *Hermannia depressa, Ipomoea obscura, Barleria macrostegia, Dianthus mooiensis subsp. mooiensis, Ipomoea oblongata, Vernonia oligocephala.*

Geophytic Herbs: *Ledebouria revoluta, Ornithogalum tenuifolium, Sansevieria aethiopica.*

Conservation

According to Mucina & Rutherford (2006), this vegetation type is classified as Endangered (EN). The conservation target is 19 % but only approximately 1% of this vegetation community is statutorily conserved, in the Magaliesberg Nature Area for example but is more conserved in addition in other reserves, mainly in De Onderstepoort Nature Reserve (Mucina & Rutherford, 2006). Transformation of this vegetation type was estimated at 48% in 2006, mainly cultivated and urban or built-up areas.

10.4.2 Plant species of conservation concern

Based on the Plants of Southern Africa (BODATSA-POSA, 2022) database, 533 plant species have the potential to occur in the project area and its surroundings. The Screening Tool Report lists one medium sensitivity plant species that could be expected to occur within the project area. Of these 533 plant species, two are listed as being Species of Conservation Concern (SCC), with a moderate and low likelihood of occurrence based on the habitat present (Table 14).

Table 14 Threatened flora species that may occur within the project area (TBC2, 2023)

Family	Taxon	Author	IUCN	Ecology	Screening Tool Sensitivity	Habitat	Likelihood of Occurrence
Apocynaceae	*Stenostelma umbelluliferum*	(Schltr.) Bester & Nicholas	NT	Indigenous; Endemic	-	Deep black turf soil in open woodland mainly in the vicinity of drainage lines.	Moderate
	Sensitive Species 1248		VU	Indigenous	Medium	Open woodland or on steep rocky hills usually in well-shaded situations.	Low

10.4.3 Field survey

The following sections discuss the results from the field survey that was conducted for the proposed project, which was undertaken on the 13th of June 2023. Habitats, the condition, and sensitivity can be seen in Table 15. The habitat associated with the project area has been classified as Modified.

Table 15: Sensitivity summary of the habitat types delineated within the project area of Influence (TBC2, 2023)

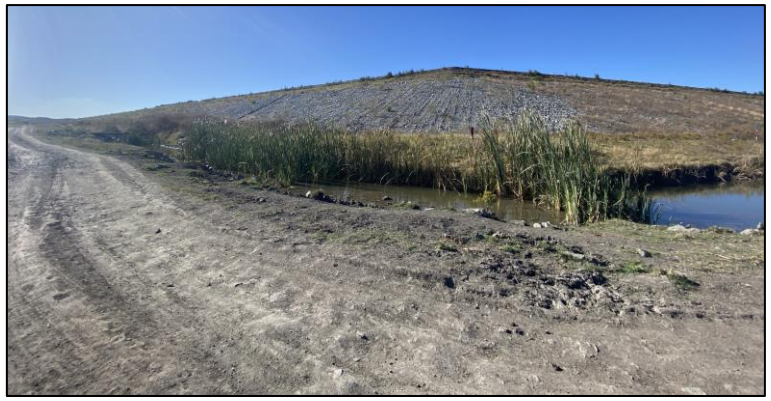
Description	SEI	Photographs
The habitat found within the entire project area is regarded as modified. Historic land clearing to accommodate mining practises has affected the soil layer and vegetation present. The clearing required the removal of plant/tree species representative of the vegetation type and has led to the encroachment of alien and invasive species with *Acacia cyclops* being the most prominent. This habitat exist**s** in a constant disturbed state as it cannot recover to a more natural state unless through human intervention. The species which were found in the project area can be seen in Table 16. ***The project area being historically cleared and subsequently disturbed is no longer a viable portion of Marikana Thornveld.***	Low	 

Table 16: Plant species found within the project area (TBC2, 2023)

Family	Species name	IUCN status	Alien Category
Amaranthaceae	*Gomphrena celosioides*		Not indigenous; Naturalised
Anacardiaceae	*Searsia lancea*	LC	
Apocynaceae	*Gomphocarpus fruticosus*	LC	
Asparagaceae	*Asparagus cooperi*	LC	
Asphodelaceae	*Aloe greatheadii*	LC	
Asteraceae	*Bidens pilosa*		Not indigenous; Naturalised
Asteraceae	*Erigeron bonariensis*		Not indigenous; Naturalised
Asteraceae	*Flaveria bidentis*		NEMBA Category 1b.
Asteraceae	*Schkuhria pinnata*		Not indigenous; Naturalised
Asteraceae	*Tagetes minuta*		Not indigenous; Naturalised
Asteraceae	*Xanthium strumarium*		NEMBA Category 1b.
Asteraceae	*Zinnia peruviana*		Not indigenous; Naturalised
Cannabaceae	*Celtis africana*	LC	
Combretaceae	*Combretum molle*	LC	
Fabaceae	*Acacia cyclops*		NEMBA Category 1b.
Fabaceae	*Dichrostachys cinerea*	LC	
Fabaceae	*Vachellia karoo*	LC	
Fabaceae	*Vachellia nilotica*	LC	
Fabaceae	*Vachellia sieberiana*	LC	
Fabaceae	*Vachellia tortilis*	LC	
Iridaceae	*Gladiolus sericeovillosus*	LC	
Lamiaceae	*Leonotis dysophylla*	LC	
Malvaceae	*Grewia flava*	LC	

Family	Species name	IUCN status	Alien Category
Meliaceae	*Melia azedarach*		NEMBA Category 1b.
Myrtaceae	*Eucalyptus camaldulensis*		NEMBA Category 1b.
Poaceae	*Aristida congesta subsp. barbicollis*	LC	
Poaceae	*Cynodon dactylon*	LC	
Poaceae	*Digitaria eriantha*	LC	
Poaceae	*Eragrostis chloromelas*	LC	
Poaceae	*Eragrostis curvula*	LC	
Poaceae	*Heteropogon contortus*	LC	
Poaceae	*Hyparrhenia hirta*	LC	
Poaceae	*Melinis repens*	LC	
Poaceae	*Panicum maximum*	LC	
Poaceae	*Pennisetum setaceum*		NEMBA Category 1b.
Poaceae	*Setaria sphacelata*	LC	
Poaceae	*Sporobolus africanus*	LC	
Proteaceae	*Faurea saligna*	LC	
Rhamnaceae	*Ziziphus mucronata subsp. mucronata*	LC	
Solanaceae	*Solanum mauritianum*		NEMBA Category 1b.
Typhaceae	*Typha capensis*	LC	
Verbenaceae	*Lantana camara*		NEMBA Category 1b.
Verbenaceae	*Verbena bonariensis*		NEMBA Category 1b.

10.5 Freshwater

Information for this section was obtained from the Wetland Delineation and Impact Assessment: Sibanye-Stillwater EPL TD2 Remining (WCS Scientific, 2023). Refer to Appendix C4.

The EPL TD2 is located within Primary Catchment A and lies on the catchment divide between quaternary catchments A21K and A21J. Catchment A21K is drained by the Sterkstroom and Gwathle River, which drain into the Crocodile River to the north. Catchment A21J is drained by the Crocodile River. Information regarding mean annual rainfall, runoff and evaporation potential per applicable quaternary catchment is provided in Table 17. Figure 12 indicates the position of the study area in relation to the affected quaternary catchments.

Table 17: Mean annual precipitation, run-off, and potential evaporation per quaternary catchment (WR2012 data, as extracted from the WET-Health Version 2 excel spreadsheet) (WCS, 2023)

Quaternary Catchment	Catchment Surface Area (km^2)	Mean Annual Precipitation (MAP) in mm	Mean Annual Run-off (MAR) in mm	MAR as percentage of MAP	Potential Evaporation (PE)	MAP:PE
A21K	864	651	27.4	4.2%	1 744	0.4
A21J	1 150	637	20.9	3.3%	1 710	0.4

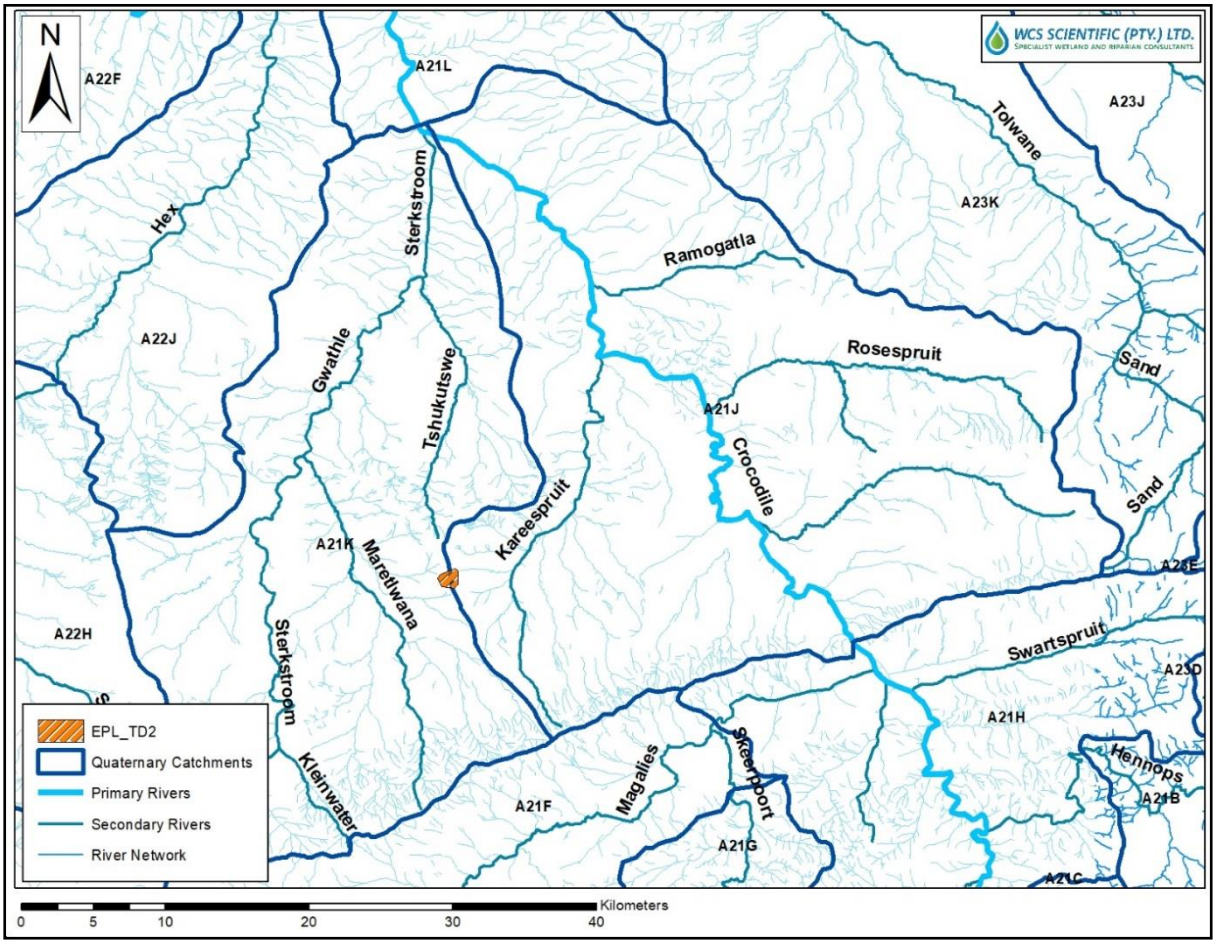


Figure 12: Map showing EPL TD2 in relation to the quaternary catchments (WCS, 2023)

10.6 Wetlands

Information for this section was obtained from the Wetland Delineation and Impact Assessment: Sibanye-Stillwater EPL TD2 Remining (WCS Scientific, 2023). Refer to Appendix C4.

10.6.1 Wetland delineation

The EPL TD2 footprint falls within the relevant regulated areas of the following aquatic ecosystems, as identified and delineated:

- A depression wetland

Other wetlands and watercourse features are present in the local landscape surrounding the EPL TD2, however, the tailings dam footprint does not extend into the regulated areas of any other wetlands or watercourses besides the depression wetland. As such, the depression wetland will be the focus of the baseline assessment, though other surrounding wetlands and watercourses may be mentioned, where relevant. The delineated and classified wetlands and other watercourses surrounding the project footprint, as well as the regulated areas applicable, are illustrated in Figure 13.

The depression wetland habitat identified is a small, isolated, and ephemeral to seasonal depression wetland that lies immediately to the north of the east-west running Marikana – Brits railway line. The railway line lies between the depression and the EPL TD2 footprint to the south of the railway line. According to Ollis et al. (2013), a depression is "a wetland or aquatic ecosystem with closed (or near-closed) elevation contours, which increases in depth from the perimeter to a central area of greatest depth and within which water typically accumulates". The depression identified does not exist within naturally closed or near closed elevation contours, and the natural elevation contours suggest a slope downwards towards the southeast. However, the railway line has been constructed on an elevated berm, and this berm has resulted in some impoundment of flow along its northern edge immediately upslope of a culvert through the railway berm. It is likely that this wetland has formed as a result of surface runoff on the low permeability clay soils of the catchment impounding against the raised berm of the Marikana – Brits railway line. Given the heavy clay nature of the soils, and their resultant low permeability, any impediments to surface runoff along preferential flow pathways in this landscape are likely to lead to flow impoundment (as infiltration is retarded), extended periods of saturation, and the resultant establishment of wetland habitat. Prior to the railway line construction, it is likely that this wetland habitat would not have existed. However, as the railway berm is likely to remain in place indefinitely, the wetland habitat that has established, though supported by the presence of a manmade structure, does fall within the definition of a wetland according to the National Water Act, Act 36 of 1998.

The EPL TD2 lies along the catchment divide between west and east-flowing drainage networks. To the west of the TD2, several watercourses start as drainage lines carrying ephemeral to seasonal surface runoff towards the west, into larger wetland and river systems. To the east, a valley bottom wetland begins immediately below the EPL return water dam (RWD) as an unchannelled system that develops a defined channel a short distance downstream. This valley bottom wetland is expected to receive overflow from the EPL RWD during periods when the capacity of the RWD is exceeded.

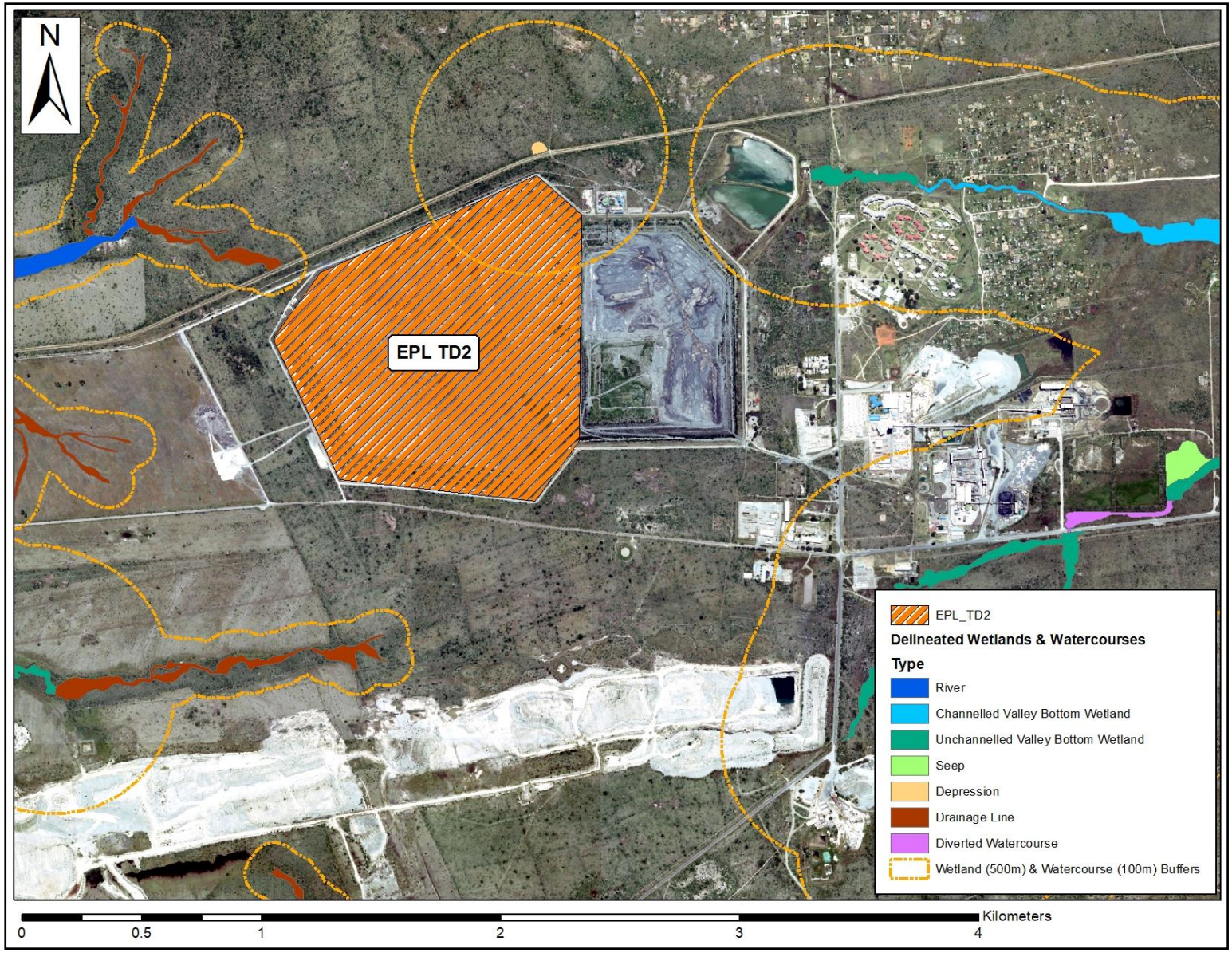


Figure 13: Map of the delineated and classified wetlands and watercourses in the landscape surrounding the EPL TD2 footprint (WCS, 2023)

10.6.2 Present Ecological State (PES)

The wetlands and watercourse within the study area are located within a landscape that has become highly modified as a result of significant mining and mining-related activities. The latest national landcover dataset – dating from 2020 – was used as the basis for the wetland PES assessments. This landcover dataset was modified in places based on observations made during the site surveys, and observations of recent land use changes (from 2020 onwards) visible on recent satellite imagery (Google Earth). The results of the land use mapping exercise are illustrated in Figure 14 and were used to inform the outcomes of the PES assessments for each of the watercourses. Each land use indicated in Figure 14 is associated with a degree of impact to the components of wetland ecology, namely, hydrology, geomorphology, vegetation, and water quality.

Land use within the wetlands, watercourses and their catchments is dominated by past and current opencast mining, mining-related activities and surface infrastructure. Mining has resulted in significant changes in the flow characteristics of the catchments, and opencast mining and other infrastructures have required the artificial and permanent diversion of watercourses, or in the case of rehabilitated opencast mine areas, the recreation of flow paths across the newly created landscape. Extensive open land remains between mine surface infrastructures but is considered to be semi-natural.

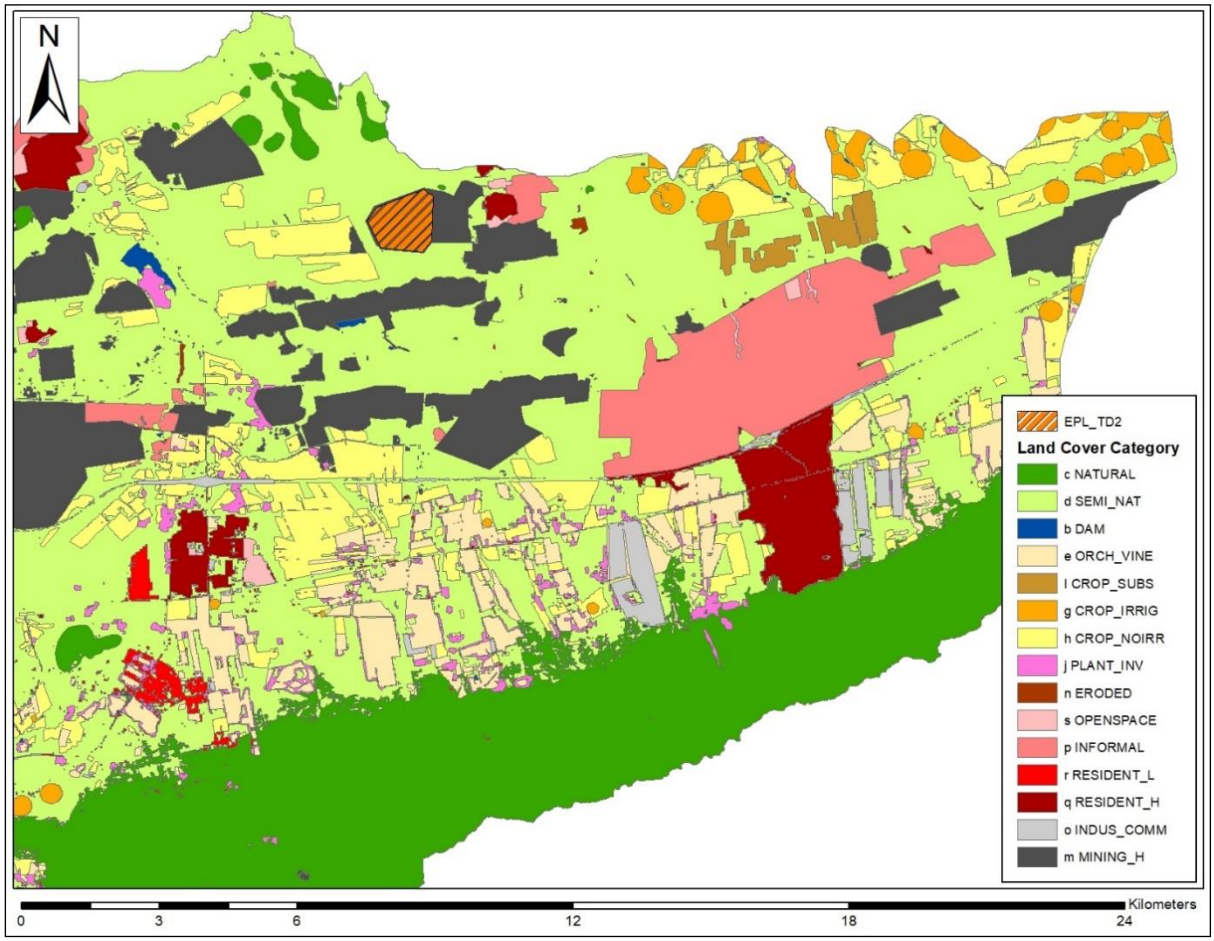


Figure 14: Map showing the land use mapping results for the larger wetland and watercourse catchment (WCS, 2023)

The above impacts and various land uses within the catchments of the wetlands and watercourses surrounding the EPL TD2 have resulted in the present ecological state of the wetlands and watercourse on site departing significantly from the assumed reference condition or un-impacted state. This is reflected in the results of the PES assessment which class the depression wetland as largely modified (PES of D), with an overall PES score of 57.6%. Other wetlands and

watercourses within the local landscape were found to range from moderately to seriously modified (PES of C to E). The results of the PES assessments for the wetlands and watercourse are illustrated in Figure 15.

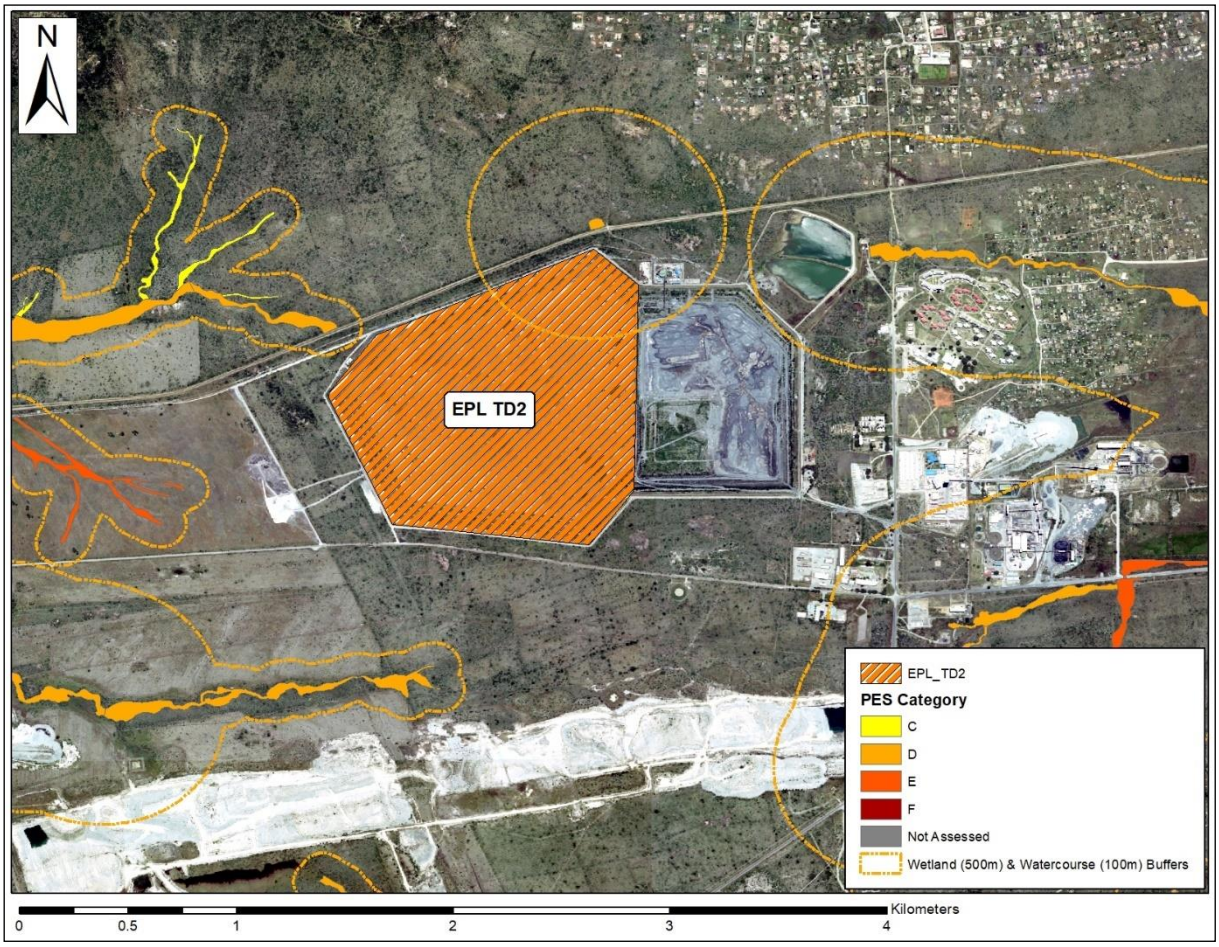


Figure 15: Map showing the results of the PES assessment (WCS, 2023)

10.6.3 Functional assessment

Wetlands have been shown to perform a wide range of functions related to water quality improvement, flood attenuation, resource provision and erosion control, among others. However, each wetland is unique in the extent to which it is able to perform these functions. Many of the functions and services attributed to a wetland are inferred from the HGM classification of the wetland, as well as the levels of disturbance, cultural importance, and potential for the wetland to perform various functions. The nature of the functions that the depression wetland (within which's regulated area of the proposed project activity lies) performs and the services that it provides were assessed using the Wet-Ecoservices tool, whereby both existing information and a field assessment were required.

The overall scores achieved are a consequence of the ability of this wetland type to supply these services and the anticipated demand for these services in the landscape. For all ecosystem services possible, the depression wetland obtained no scores, or very low to low scores. This is a consequence of the very small size of the depression, its isolation from the drainage network, and the limited saturation anticipated, both in terms of degree of saturation (temporary saturation) and period of saturation (ephemeral to seasonal). Limited to no information was available on the cultural and/or spiritual significance of the wetland, and these services may have been underestimated. The results of the assessment are summarised and illustrated in Table 18 and Figure 16.

Table 18: WET-EcoServices summary sheet for the wetland HGM types present within the study area (WCS, 2023)

		Present State			
ECOSYSTEM SERVICE		Supply	Demand	Importance Score	Importance
REGULATING AND SUPPORTING SERVICES	Flood attenuation	0.0	0.0	0.0	Very Low
	Stream flow regulation	0.0	0.0	0.0	Very Low
	Sediment trapping	No scores	0.0	No scores	No scores
	Erosion control	1.4	0.0	0.0	Very Low
	Phosphate assimilation	No scores	0.0	No scores	No scores
	Nitrate assimilation	0.1	0.0	0.0	Very Low
	Toxicant assimilation	No scores	0.0	No scores	No scores
	Carbon storage	0.5	2.7	0.3	Very Low
	Biodiversity maintenance	0.0	2.0	0.0	Very Low
PROVISIONING SERVICES	Water for human use	0.6	0.0	0.0	Very Low
	Harvestable resources	1.0	0.0	0.0	Very Low
	Food for livestock	2.0	0.0	0.5	Very Low
	Cultivated foods	2.5	0.0	1.0	Low
CULTURAL SERVICES	Tourism and Recreation	0.0	0.0	0.0	Very Low
	Education and Research	0.0	0.0	0.0	Very Low
	Cultural and Spiritual	0.0	0.0	0.0	Very Low

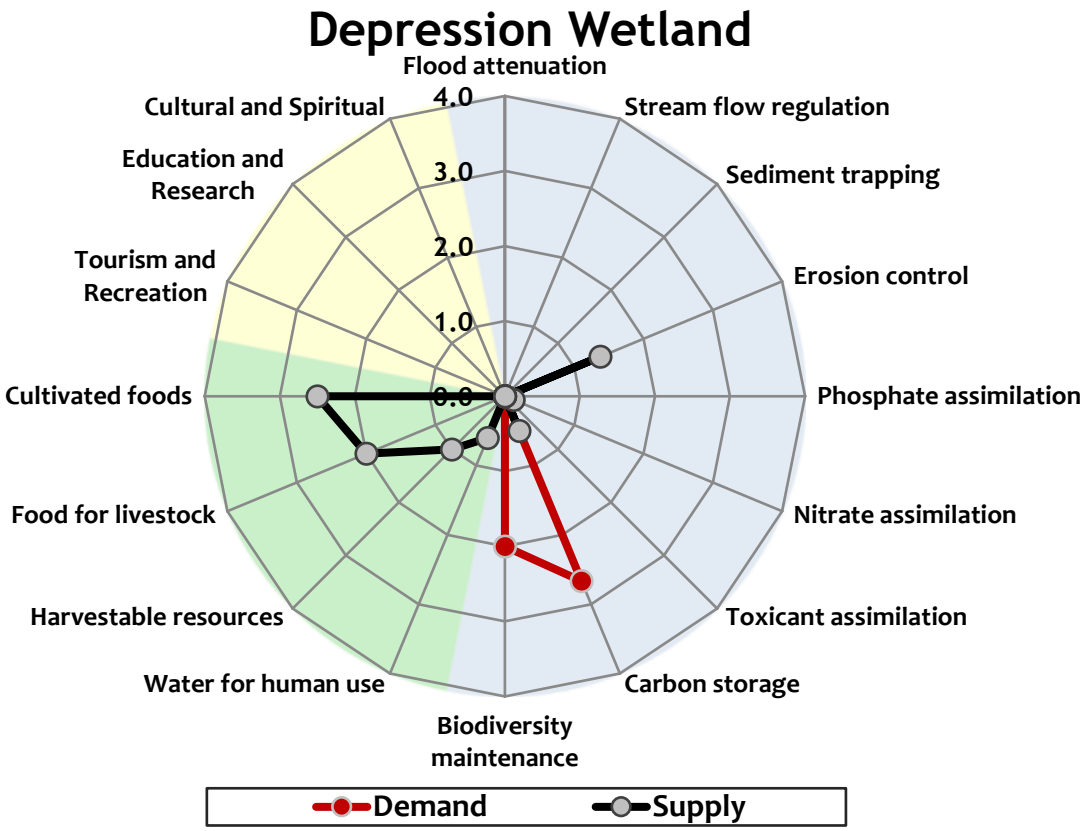


Figure 16:. Radial plot depicting the results of the WET-EcoServices assessments for the depression wetland (WCS, 2023)

10.6.4 Wetland Importance and Sensitivity

In terms of assessing the importance and sensitivity of the wetlands, the following factors were considered:

- The wetland habitats delineated fall within an area considered to be an Ecological Support Area according to the North West Province's Biodiversity Sector Plan's Aquatic Ecosystems dataset (READ, 2015), which means that these areas are necessary in meeting the provinces' biodiversity targets. However, it is important to note that the proposed activity lies within an existing, and completely transformed, mine infrastructure footprint – a tailings dam – which although indicated as forming part of an ESA, currently supports no natural, or even semi-natural habitat.
- The vegetation unit that covers the study area, and within which the wetlands and watercourses flow – Marikana Thornveld – is considered Vulnerable according to the published National List of Ecosystems that are Threatened and in Need of Protection (GN1002 of GG34809, NEMBA 2004), and therefore intact areas of habitat should be maintained to limit further losses. Unfortunately, due to the widespread, and long history of, use, very little intact habitat remains, and most "natural" vegetation across the site is either secondary or heavily utilised and transformed.
- The wetland vegetation type of the area, Central Bushveld Bioregion (Valley Bottom) is considered ***Critically Endangered***.
- The moderately to seriously modified state of the wetlands within the surrounding landscape.
- The importance of the valley bottom wetlands as an ecological corridor in a largely transformed rural landscape.

- The isolated nature, and potentially artificial driver, of the depression wetland to the north of the tailings dam facilities.
- The wetlands and watercourses receive flow inputs as seepages from various mining infrastructures. The quality of these inputs is expected to vary widely, but can, in many cases, be assumed to be of poor quality. The wetlands receiving these flows will have varying capacities (dependent on type and condition) to aid in improving water quality.

Given the above points, the wetland and watercourse habitats can be considered to be of varying importance from both a functional and conservation perspective and should be properly managed and prevented from deteriorating further. Within this context, an IS assessment was conducted for every hydro-geomorphic wetland unit and watercourse identified within the local landscape surrounding the project footprint (EPL TD2). The results of the IS assessment indicate that valley bottom wetland types are of moderate importance and sensitivity due to their greater assessed functionality – particularly in terms of regulating and supporting services such as water quality improvement, streamflow regulation, sediment trapping and potential to support rare or unique species. The isolated depression and other watercourses – such as ephemeral to seasonal drainage lines – are of low/marginal importance and sensitivity. The results of the IS assessment are illustrated in Figure 17:.

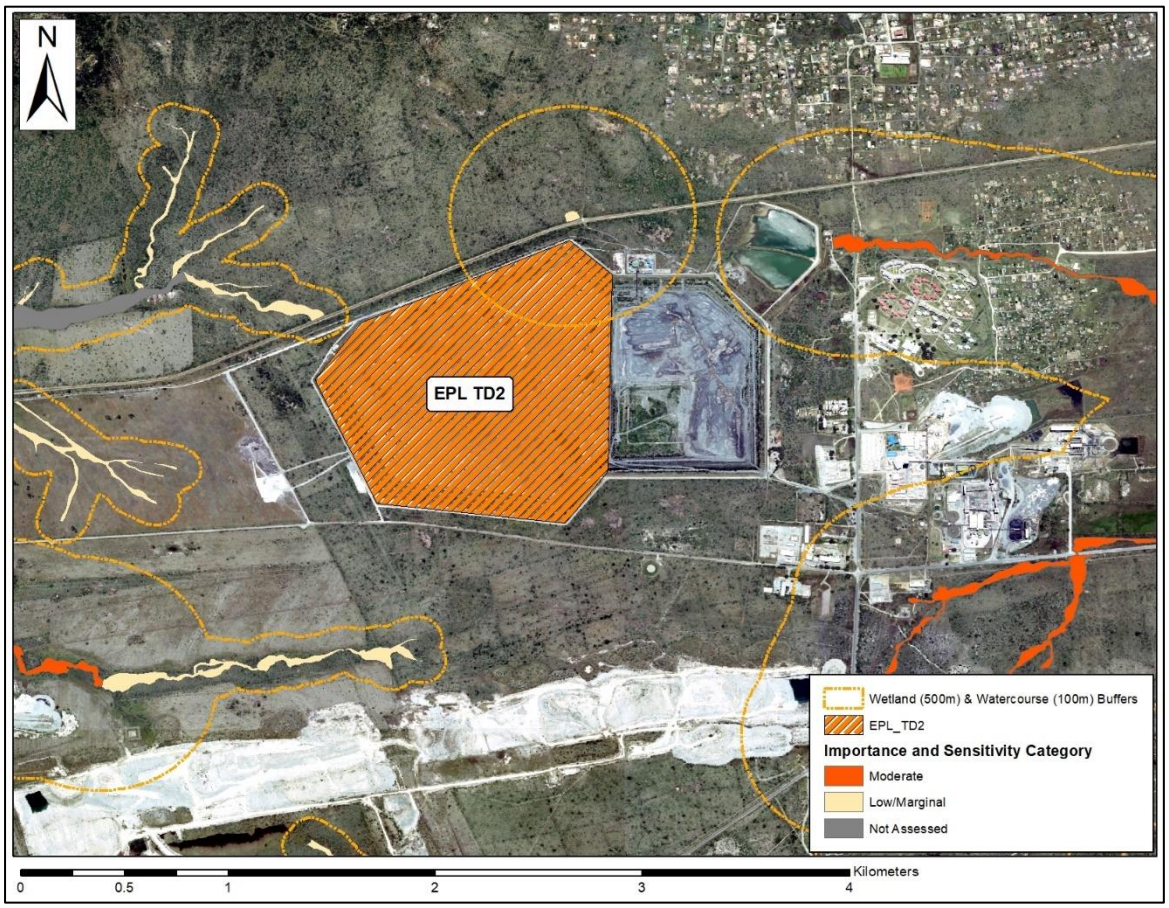


Figure 17: Map illustrating the results of the Importance and Sensitivity Assessment (WCS, 2023)

10.7 Groundwater

Information for this section was obtained from the Sibanye-Stillwater – Lonmin Operations: Retreatment of Eastern Platinum (Pty) Ltd Tailings Dam 2: Hydrogeological Impact Assessment (Geostratum, 2023). Refer to Appendix C5.

10.7.1 Monitoring boreholes

Monitoring and hydrocensus boreholes within proximity of the TD1 and TD2 are presented in Figure 10. Twenty-seven (27) monitoring boreholes were located within proximity of the TD's. Two boreholes (EP BH 25 and EP BH 25a) were blocked, while no access could be obtained to three boreholes (EP BH 39, EP BH 42 and EP BH 43) during the evaluation of monitoring data by Water Hunters (2019) (refer to Table 19).

Table 19 Locality of monitoring boreholes (Geostratum, 2023)

NAME	Coordinates (Datum: WGS84, DD)		Elevation - SRTM 1 arc second	Reported Water Level - June 2019	Status	Description
	Latitude	Longitude	[m AMSL]	[m]	[-]	[-]
EP BH 03	-25.6907	27.60364	1180.41	7.66	Yes	EP Tailings Dam 1 Deep Borehole (Upstream)
EP BH 03a	-25.6907	27.60363	1180.44	7.75	Yes	EP Tailings Dam 1 Shallow Borehole (Upstream)
EP BH 05	-25.683	27.60786	1168.91	3.11	Yes	Deep Borehole - Downstream (TD 1) & Upstream (RWD)
EP BH 05a	-25.683	27.60787	1168.87	3.05	Yes	Shallow Borehole - Downstream (TD 1) & Upstream (RWD)
EP BH 06	-25.6801	27.61151	1161.12	2.05	Yes	Downstream of RWD - Deep Borehole
EP BH 06a	-25.68	27.61151	1161.06	0.5	Yes	Downstream of RWD - Shallow Borehole
EP BH 17	-25.6844	27.60836	1167.96	8.21	Yes	Downstream of Tailings Dam 1 (Deep)
EP BH 17a	-25.6844	27.60837	1167.88	8.32	Yes	Downstream of Tailings Dam 1 (Shallow)
EP BH 18	-25.6881	27.60803	1173.25	6.78	Yes	Downstream of Tailings Dam 1 (Deep)
EP BH 18a	-25.6881	27.60803	1173.25	6.82	Yes	Downstream of Tailings Dam 1 (Shallow)
EP BH 24	-25.6917	27.59954	1179.07	3.97	Yes	Upstream of EP Tailings Dam Extension (Deep)
EP BH 24a	-25.6917	27.59952	1179.04	3.97	Yes	Upstream of EP Tailings Dam Extension (Shallow)
EP BH 25	-25.6926	27.59652	1176.5	-	Blocked	Upstream of EP Tailings Dam Extension (Deep)
EP BH 25a	-25.6926	27.59653	1176.53	-	Blocked	Upstream of EP Tailings Dam Extension (Shallow)
EP BH 26	-25.6916	27.59041	1171.68	4.79	Yes	Upstream of EP Tailings Dam Extension (Deep)
EP BH 26a	-25.6916	27.59042	1171.72	4.8	Yes	Upstream of EP Tailings Dam Extension (Shallow)

NAME	Coordinates (Datum: WGS84, DD)		Elevation - SRTM 1 arc second	Reported Water Level - June 2019	Status	Description
	Latitude	Longitude	[m AMSL]	[m]	[-]	[-]
EP BH 27	-25.6835	27.58995	1168.89	5.16	Yes	Downstream of EP Tailings Dam Extension (Deep)
EP BH 27a	-25.6835	27.58994	1168.87	5.1	Yes	Downstream of EP Tailings Dam Extension (Shallow)
EP BH 28	-25.6819	27.59409	1175	8.15	Yes	Downstream of EP Tailings Dam Extension (Deep)
EP BH 28a	-25.6819	27.5941	1175	8.15	Yes	Downstream of EP Tailings Dam Extension (Shallow)
EP BH 29	-25.6801	27.59896	1177.91	5.84	Yes	Downstream of EP Tailings Dam Extension (Deep)
EP BH 29a	-25.6801	27.59897	1177.89	5.8	Yes	Downstream of EP Tailings Dam Extension (Shallow)
EP BH 39	-25.6807	27.60578	1165.57	-	No access	Downstream of TD 1 & Upstream of RWD
EP BH 40	-25.682	27.60691	1168.17	1.57	Yes	Downstream of TD 1 & Upstream of RWD
EP BH 41	-25.6858	27.60852	1170.82	-	Not sampled	Downstream of TD 1
EP BH 42	-25.681	27.61051	1163.57	-	No access	Downstream of RWD 1
EP BH 43	-25.6807	27.61091	1163	-	No access	Downstream of RWD 1

[m AMSL] meters above mean sea level;

[m] meter

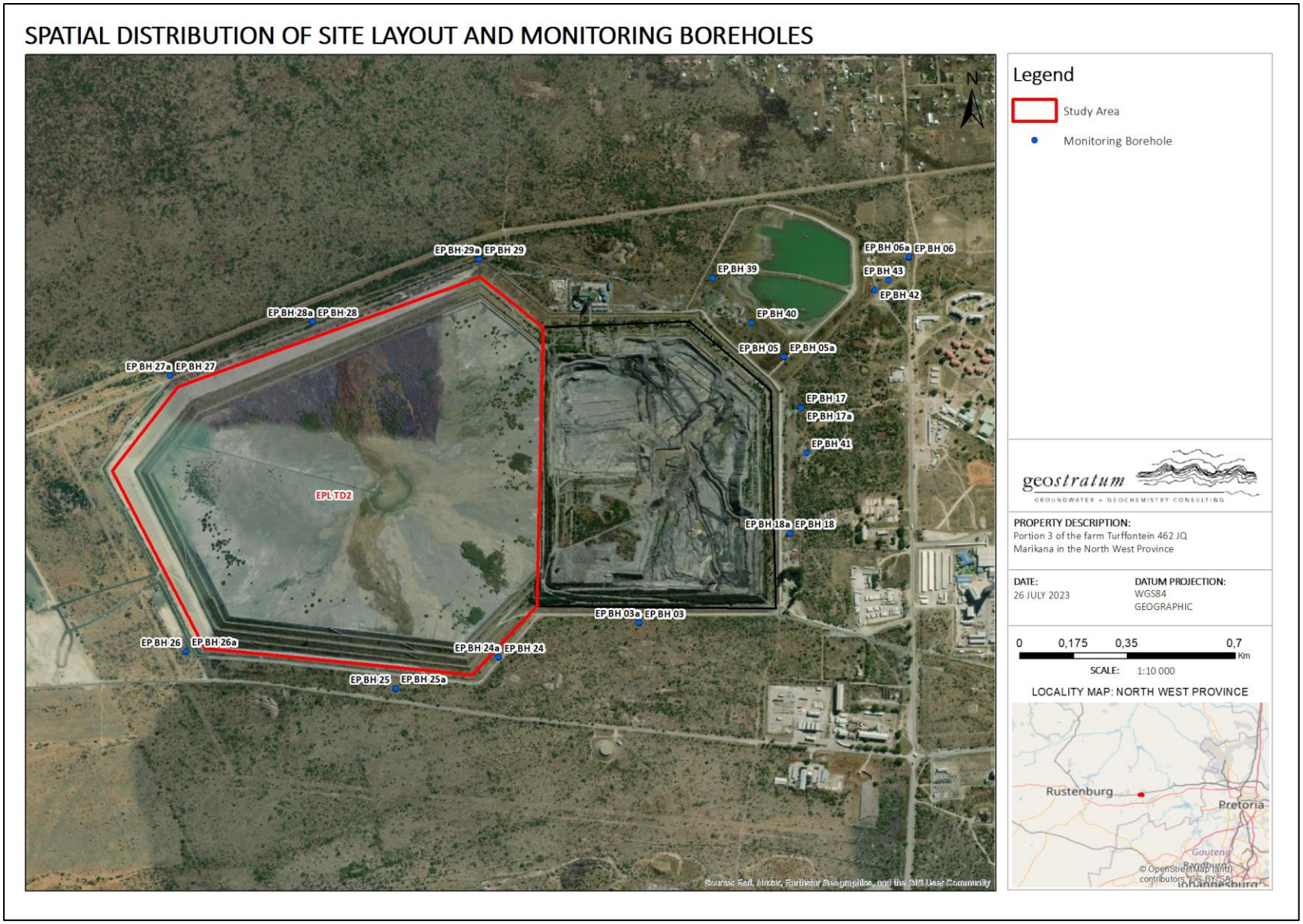


Figure 10: Spatial distribution of site layout and monitoring boreholes (Geostratum, 2023)

10.7.2 Groundwater levels

Figure 18 shows the linear correlations between topography and groundwater elevations acquired from the available monitoring data. A correlation of 83 % was calculated (root mean squared - RMS). The correlation can be described as good.

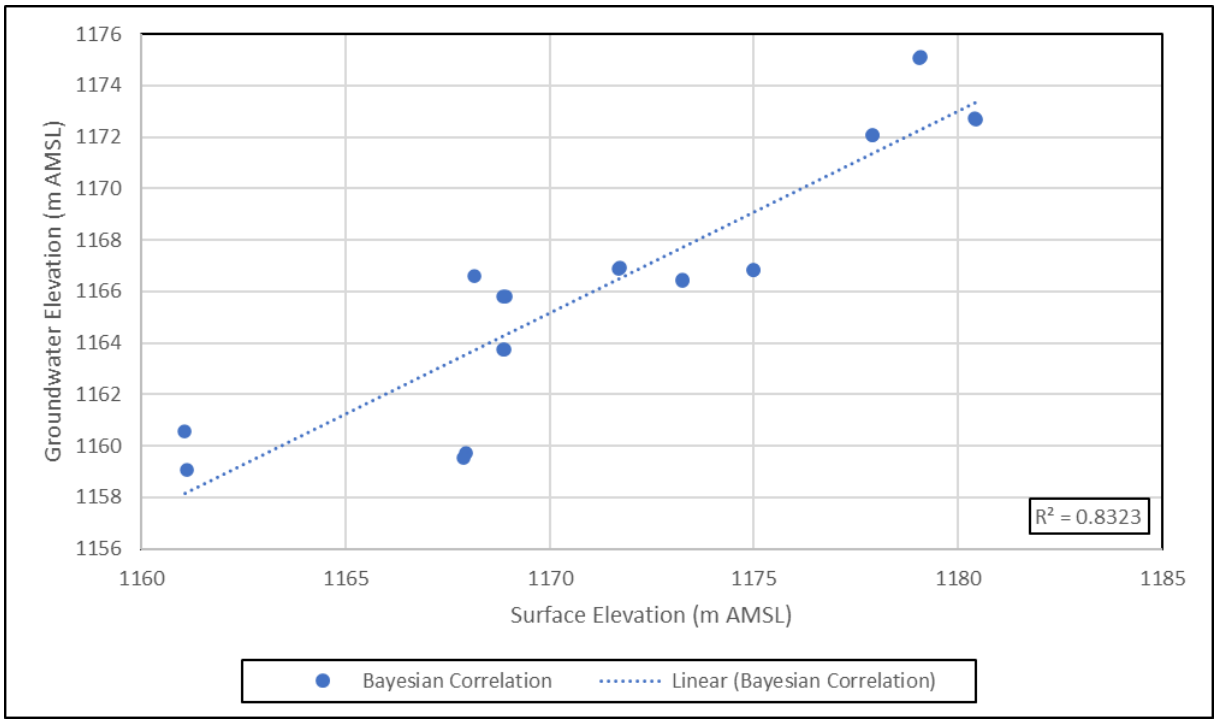


Figure 18: Bayesian Correlation for Monitoring Boreholes (2019) (Geostratum, 2023)

A groundwater flow direction map was constructed, as presented in Figure 19:, using water levels measured by Water Hunters (2019). The groundwater flow direction from EPL-TD2 is in a general north westerly direction towards the Maretlwana River, mimicking topography.

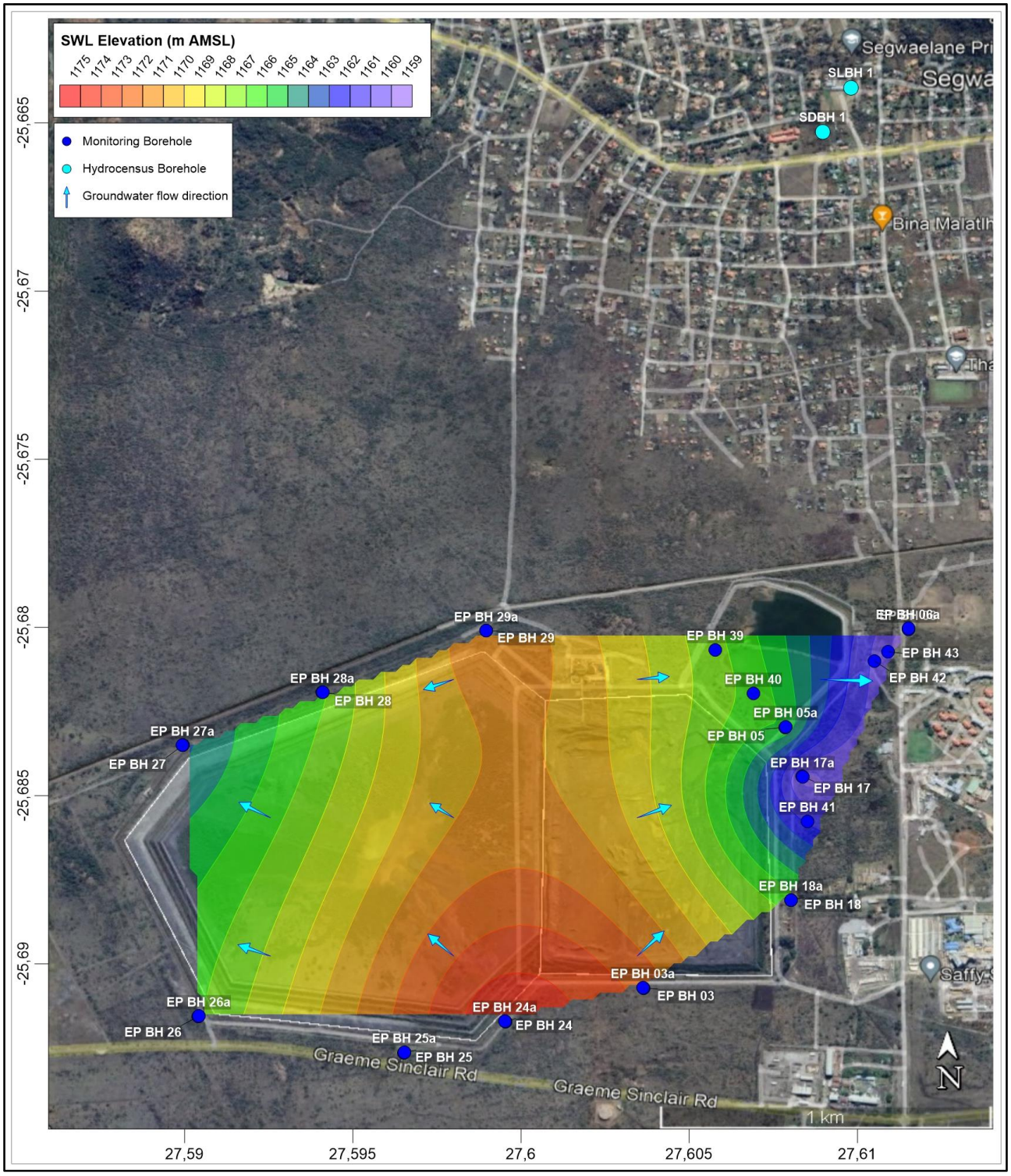


Figure 19: Groundwater Flow Direction Map (data from Water Hunters, 2019) (Geostratum, 2023)

10.7.3 Groundwater vulnerability and aquifer classification

According to Parsons (1995), aquifer classification is based on the aquifer characteristics and the non-technical and water-supply considerations. The classifications and definitions for each aquifer system are summarised in Table 20.

Table 20: Definitions of Aquifer System Management Classes (After Parsons (1995) (Geostratum, 2023)

Sole source aquifer	An aquifer which is used to supply 50% or more of domestic water for a given area, and for which there are no reasonable available alternative sources should the aquifer be impacted upon or depleted. Aquifer yields and natural water quality are immaterial.
Major aquifer system	Highly permeable formations, usually with a known probable presence of significant fracturing. They may be highly productive and able to support large abstractions for public supply and other purposes. Water quality is generally very good (less than 150 mS/m).
Minor aquifer system	These can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability. Although these aquifers seldom produce large quantities of water, they are important both for local supplies and supplying base flow to rivers.
Non aquifer system	These are formations with negligible permeability that are generally regarded as not containing groundwater in exploitable quantities. Water quality may also be such that it renders the aquifer as unusable. However, groundwater flow through such rocks, although imperceptible, does take place, and needs to be considered when assessing the risk associated with persistent pollutants.
Special aquifer system	An aquifer designated as such by the Minister of Water Affairs, after due process.

The aquifer underlying the tailings dam was classified in terms of the Aquifer System Management Classes (Table 21). Based on the desktop study, there are essentially two aquifers underlying the site.

Table 21: Aquifer Classification Summary (Geostratum, 2023)

Aquifer or aquitard	Type	Classification (after Parsons, 1995)
Weathered aquifer	Weathered zone aquifer	Not specified according to Parsons, however based on negligible permeability for groundwater flow, the shallow aquifer is classified as a minor aquifer
Secondary fractured aquifer of the Bushveld Igneous Complex formed through secondary fracture / fault zones	Deeper fractured rock aquifer	Minor aquifer

The aquifer system and the aquifer vulnerability are assigned a value as defined in Table 22 below. Through multiplying the aquifer system value by the vulnerability value, the Groundwater Quality Management (GQM) index is determined. Based on this value, the level of protective action that must be upheld is recommended. The values shaded in blue indicate the rating of the aquifer in the study area. According to the aquifer vulnerability assessment, a level of protection that ensures non-degradation of the aquifer system is recommended.

Table 22: Aquifer classification and vulnerability assessment (Geostratum, 2023)

Aquifer system		Aquifer vulnerability	
Management qualification		Classification	
Class	Points	Class	Points
Sole Source Aquifer System	6	High	3
Major Aquifer System	4	Medium	2
Minor Aquifer System	2	Low	1
Non-Aquifer System	0		
Special Aquifer System	0-6		

Aquifer system		Aquifer vulnerability	
Management qualification		**Classification**	
Class	**Points**	**Class**	**Points**
GQM INDEX		**Level of protection**	
<1		Limited Protection	
1 to 3		Low Level Protection	
3 to 6		Medium Level Protection	
6 to 10		High Level Protection	
>10		Strictly Non-Degradation	

10.8 Air Quality

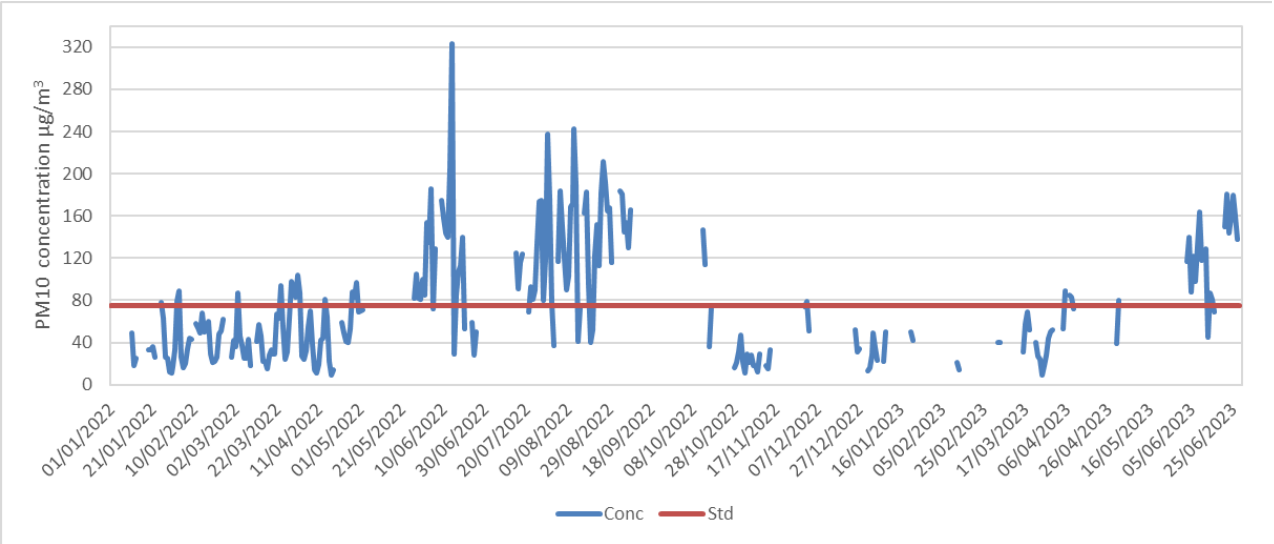
Information for this section was obtained from the Air Quality Specialist Study for the proposed re-mining of Tailings Dam 2 at the Sibanye-Stillwater Eastern Platinum Mine (uMoya, 2023). Refer to Appendix C1.

10.8.1 Ambient air quality

Ambient air quality monitoring is also conducted by the Rustenburg Local Municipality at Marikana, approximately 12 km to the west-southwest of the Sibanye-Stillwater Eastern Platinum Mine. Ambient air quality monitored at this station is influenced by the nearby sources and is therefore representative of air quality in the general area.

Ambient PM_{10} and $PM_{2.5}$ monitoring data at Marikana is accessible from the South African Air Quality Information System (SAAQIS) (https://saaqis.environment.gov.za/). The ambient PM_{10} and $PM_{2.5}$ concentrations are presented in Figure 20 from 01-01-2022 to 30-06-2023 where they are compared with the 24-hour NAAQS limit values of 75 µg/m^3 and 40 µg/m^3, respectively.

The average PM_{10} concentration for the period is 76.6 µg/m^3 with 119 exceedances of the limit value of 75 µg/m^3. The NAAQS provides for 4 exceedances of the limit value per year. PM_{10} concentrations at Marikana are therefore high as they exceed the NAAQS. The average $PM_{2.5}$ concentration for the period is 21.5 µg/m^3 with 31 exceedances of the limit value of 40 µg/m^3. The NAAQS for $PM_{2.5}$ does not provide for any exceedance of the limit value per year. $PM_{2.5}$ concentrations at Marikana are therefore also high as they exceed the NAAQS. The highest PM_{10} and $PM_{2.5}$ concentrations occur in the winter.



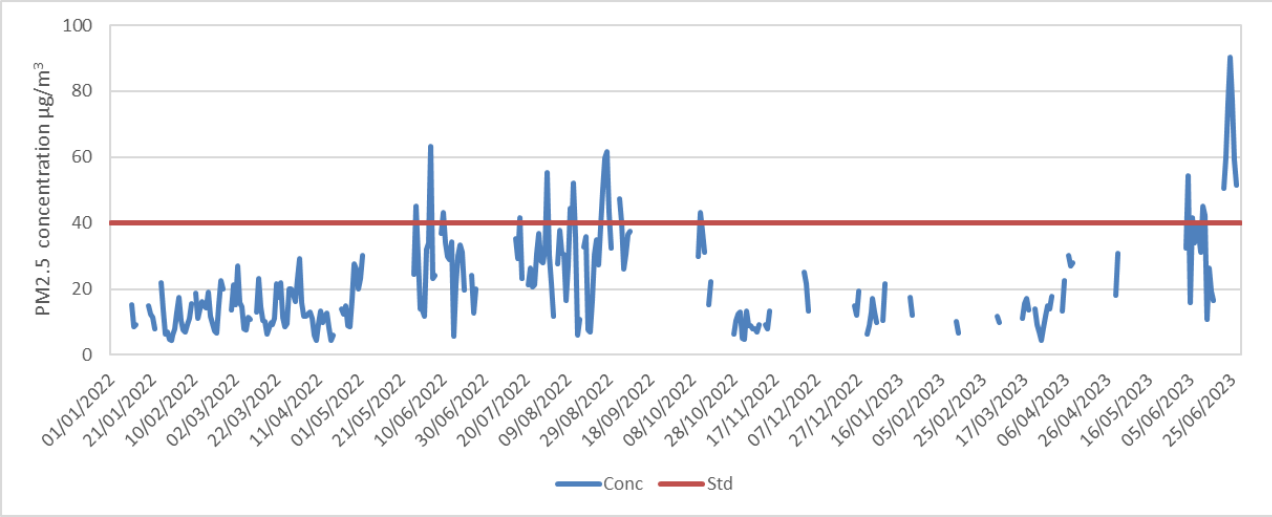


Figure 20: PM_{10} (top) and $PM_{2.5}$ (bottom) concentrations in µg/m3 at Marikana from 01-01-2022 to 30-06-2023 (https://saaqis.environment.gov.za/) (uMoya, 2023)

Dust fallout (DFO) is undertaken at Sibanye-Stillwater Eastern Platinum Mine by Aquatico Scientific (Pty) Ltd. The monitoring is done according to the requirements of the national dust control regulations (DEA 2013), according to SANS 1929:2005 and ASTM Standard, D1739-98: Standard Test Method for the Collection and Measurement of Dust fall (Settleable Particulate Matter). Dust fallout gauges are exposed for a month at a time, and the collected samples are weighed in the gravimetric laboratory and then converted to dust fallout in mg/m^2/day. DFO monitoring at 25 sites in and around the Eastern Marikana Section that are relevant to the Project includes sites in non-residential areas, sites in the surrounding residential areas and on-site. The location of these monitoring points is shown in Figure 21.

DFO monitoring data for the 12-month period from April 2022 to March 2023 is presented and compared with the limit value of the National Dust Fallout Standards for non-residential areas of 1 200 mg/m^2/day and residential areas of 600 mg/m^2/day in Table 23. The DFO measured at Site LMN36, East of the Hostels, is relatively high and exceeds the DFO limit value for residential areas twice during the 12-month period that is assessed. Otherwise the DFO measured in residential areas is relatively low. The DFO measured at the non-residential sites is generally low and below the limit value. The only exceedances of the limit value during the 12-month period assessed occurred at LMN54 (then NW Tailings) and LMN85 (Grout Belt Plant), both in December 2022.

Figure 21: Location of DFO monitoring points in the Eastern Marikana Section (Aquatico Scientific, 2023) (uMoya, 2023)

Table 23: DFO measured from April 2022 to March 2023 in the Eastern Marikana Section in mg/m2/day (from Aquatico Scientific, 2023). Exceedances are shown in bold font (uMoya, 2023)

Site ID	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-23	Feb-23	Mar-23	Site classification	DFO limit ($mg/m^2/day$)
LMN33	376	208	79	42	-	89	92	105	-	349	128	144	Residential	600
LMN36	**678**	403	102	108	-	88	-	-	380	**688**	172	-	Residential	600
LMN40	161	80	107	107	129	58	108	217	239	194	159	256	Residential	600
LMN99	533	55	62	86	50	72	33	91	105	115	83	152	Residential	600
LMN102	232	151	51	77	52	92	62	57	76	97	119	230	Residential	600
LMN116	85	99	37	131	83	96	89	86	106	137	110	164	Residential	600
LMN51	-	-	105	-	-	-	-	-	-	-	-	-	Non-residential	1200
LMN52	243	101	110	712	58	81	248	178	196	189	172	138	Non-residential	1200
LMN87	386	207	114	39	90	126	369	121	267	234	109	192	Non-residential	1200
LMN111	160	140	741	231	100	-	-	-	-	-	-	-	Non-residential	1200
LMN113	109	221	234	439	433	468	301	212	97	137	138	181	Non-residential	1200
LMN32	313	107	128	34	140	97	-	-	-	-	-	-	Non-residential	1200
LMN85	187	176	183	39	81	108	119	-	**1450**	-	-	-	Non-residential	1200
LMN86	74	647	126	131	121	101	117	124	284	166	172	-	Non-residential	1200
LMN89	323	180	157	186	-	-	-	-	-	-	-	-	Non-residential	1200
LMN114	116	317	36	152	79	117	142	-	53	55	113	93	Non-residential	1200
LMN115	-	-	-	-	41	79	142	134	142	61	199	35	Non-residential	1200
LMN118	380	268	205	234	164	194	480	326	394	478	201	223	Non-residential	1200
LMN140	129	131	67	-	85	73	417	-	218	-	124	220	Non-residential	1200
LMN53	378	43	150	257	171	196	230	318	197	322	321	284	Onsite	1200
LMN54	778	720	506	255	487	507	803	455	**2380**	967	409	772	On-site	1200

10.8.2 Emission Inventory

The re-mining production rate to the Eastern Bulk Tailing Treatment (EBTT) Plant will be at an average rate of 320 000 tonnes/month (3.8 mt/year) for both the hydraulic and mechanical re-mining phases at TD2. Hydraulic re-mining is expected to occur during the first five years. The hydraulic mining process is a wet process, hence no emissions are expected for this phase. Once the TD2 is dry enough, Sibanye-Stillwater will revert to mechanical re-mining. This involves loading the tailings material into trucks which will transport the tailings to feed bins at the new repulping plant, which then transfers pulped material to the EBTT Plant. From the EBTT Plant, the slurry is pumped across land in a 10 km steel pipe to the BTT plant for processing.

Dust emissions are therefore expected:

- During materials handling on the tailings dam during mechanical mining and loading of tailings into trucks.
- Along haul roads between the tailings dam and new repulping plant.
- During transfer of tailings from trucks into feed bins at the repulping plant.

The rest of the process is wet – no further dust emissions are expected during the transfer of slurry from EBTT to BTT. Emissions from the processing of materials at BTT and subsequent transfer to TD6 is also a wet process and will not generate dust emissions.

Emissions of TSP, PM_{10} and $PM_{2.5}$ for the proposed mechanical re-mining of TD2 at the EPL are estimated according to the methodology described in Section 6.2, and in accordance with activity information provided by Alta Van Dyk Consulting, as summarised above. The following mitigations measures were taken into account when developing the emission inventory:

- Particulate matter is mitigated by means of an irrigation system management of deposition cycles in strategic areas, chemical suppression and vegetation cover.
- Haul roads are sprayed with water twice a day to contain dust emissions, and more than twice a day in windy conditions.

The total emission of TSP from the proposed activities is estimated to be 386.37 tonnes per annum (Table 24). The total PM_{10} and $PM_{2.5}$ emission is 133.43 and 29.44 tonnes per annum respectively. Unpaved haul roads are expected to be the largest source of TSP, PM_{10} and $PM_{2.5}$ associated with the proposed mechanical re-mining of TD2, followed by emissions from TD2, and then the feed bins at the Repulping Plant (Table 24).

Table 24: Particulate emissions in tonnes per annum for the proposed mechanical re-mining of TD2 at the EPL (uMoya, 2023)

Operation	**TSP**	**PM_{10}**	**$PM_{2.5}$**
	tonnes/annum	tonnes/annum	tonnes/annum
Feed bins at Repulping Plant			
Material Handling	0.71	0.34	0.05
TD2			
Material Handling	0.71	0.34	0.05
Wind Erosion	107.11	53.56	21.42
Unpaved Haul Roads			
TD2 to Repulping Plant	277.83	79.19	7.92
TOTAL EMISSIONS	386.37	133.43	29.44

10.9 Noise

Information for this section was obtained from the Environmental Noise Impact Assessment for Sibanye-Stillwater Retreatment of Eastern Platinum (Pty)Ltd (EPL) Tailings Dam 2 On Portion 3 of the Farm Turffontein 462-JQ Marikana Operations.(dBAcoustics, 2023). Refer to Appendix C6.

10.9.1 Description of receiving environment

Noise measuring points for the selected to be representative of the prevailing ambient noise levels for the study area and include all the noise sources such as distant traffic and mining noise but exclude traffic noise which was intermittent in the vicinity of the measuring points. The measuring points along the boundaries of the study area and inside the boundaries of the mining area and the physical attributes of each measuring point are described in Table 25 and illustrated in Figure 22.

Table 25: Noise measuring points and coordinates for the EPL TD2 re-mining project (dBAcoustics, 2023)

Position	Latitude	Longitude	Remarks
1	25° 41.247'S	27° 36.779'E	Northern side at administrative buildings. Traffic noise.
2	25° 40.689'S	27° 36.668'E	Western corner of the mining area. Traffic noise.
3	25° 40.793'S	27° 36.039'E	Southern side of the opencast pit along the boundary fence. Distant traffic noise and mining activities.
4	25° 40.830' S	27° 35.353'E	Southern side of the opencast pit along the boundary fence. Distant traffic noise and mining activities.
5	25° 41.356'S	27° 35.325'E	Northern side of the opencast pit. Distant traffic noise.
6	25° 41.566'S	27° 35.658'E	Northern corner of the fenced in area. Traffic noise.

The residential areas in the vicinity of TD2 and other mining activities are illustrated in Figure 5.1.

The distances between the different mine project areas and the residential properties are given in Table 5.1. This is for direct line of sight and vertical structures such as trees, topography between the source and receptors were not taken into consideration.

Table 26: Distances (in metres) between proposed re-mining of TD2 and residential areas (dBAcoustics, 2023)

Residential area	Hydraulic pump at TB2	BTT Plant	Pipeline	Hauling road	Earthmoving Equipment
A	967	990	1 133	1 114	921
B	1 241	1 037	878	827	996
C	1 832	1 760	1 726	1 669	1 708
Northern boundary	350	280	836	1 297	491
Western boundary	360	1 494	1720	1 992	769
Southern boundary	400	1 353	1 486	1 448	684

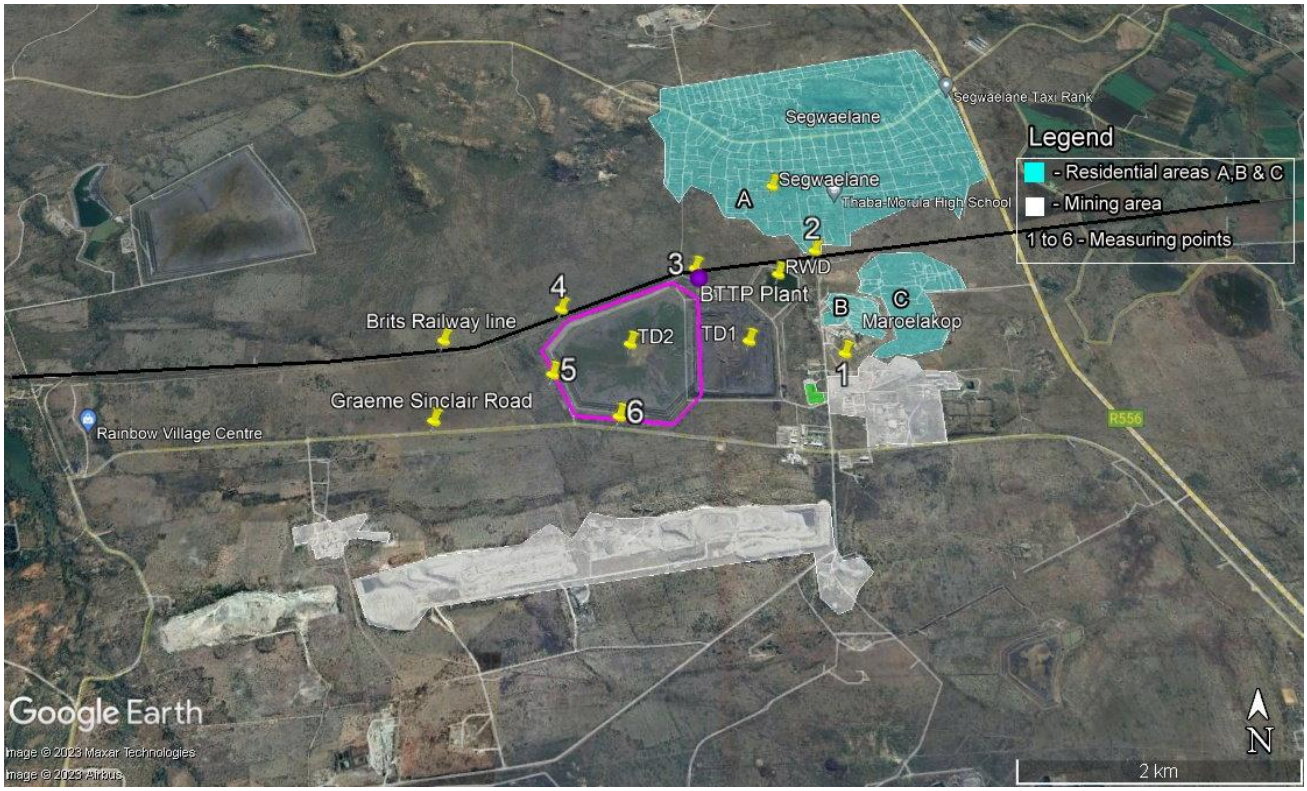


Figure 22: Noise measuring points for the EPL TD2 project area (dBAcoustics, 2023)

The following is of relevance to the ambient noise measurements:

- The LAeq was measured over a representative sampling period exceeding 10 minutes at each measuring point; and
- The noise survey was conducted during the day and night-time period being 06h00 to 22h00 for the daytime.

The following observations were made in and around the study area:

- The proposed re-mining of TD2 will take place in an area where there are other mining activities;
- There was a constant to intermittent flow of traffic along Graeme Sinclair Road and the access road to Saffy Shaft Sibanye-Stillwater;
- There was an intermittent flow of traffic to Segwaelane to the north of the mining area;
- Traffic noise contributes to the higher prevailing ambient noise level at some of the measuring points;
- The wind and weather conditions play an important role in noise propagation; and
- Distant traffic noise, mining activity noise and domestic type noises contribute to a large portion of the prevailing ambient noise levels.

The following are noise sources in the vicinity of and the boundaries of the study area:

- Distant mining activities noise – Saffy shaft, BTT Plant, and other mining activities;
- Domestic type noise such as animals, people talking, amplified music;
- Traffic noise along the feeder roads in the vicinity of the study area;
- Distant traffic noise from the abutting feeder roads;
- Insects;
- Birds; and
- Wind noise.

10.9.2 Results of the noise survey

Table 27 shows the prevailing ambient noise levels for the specific areas measured, which include all the noise sources currently in the area such as domestic, traffic noise, distant mine noise and natural noise sources. Leq is the average noise level for the specific measuring point over a period, the Lmax is the maximum noise level and the Lmin is the minimum noise level registered during the noise survey for the specific area in dBA.

The prevailing noise levels at the different measuring points are illustrated in Figure 23 (daytime), Figure 25 (nighttime 1) and Figure 26 (nighttime 2).

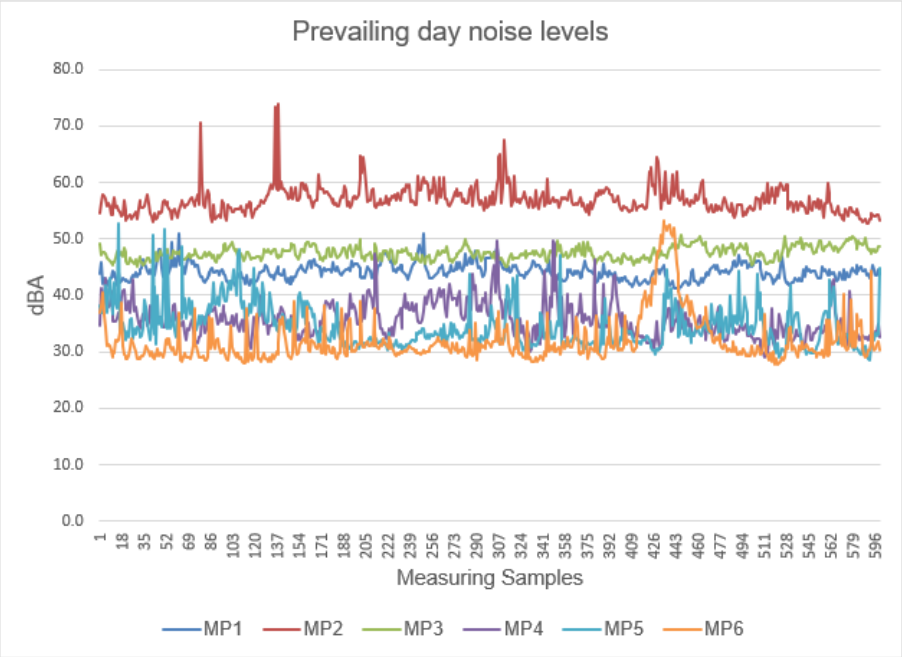


Figure 23: Prevailing ambient noise levels in the study area – daytime (dBAcoustics, 2023)

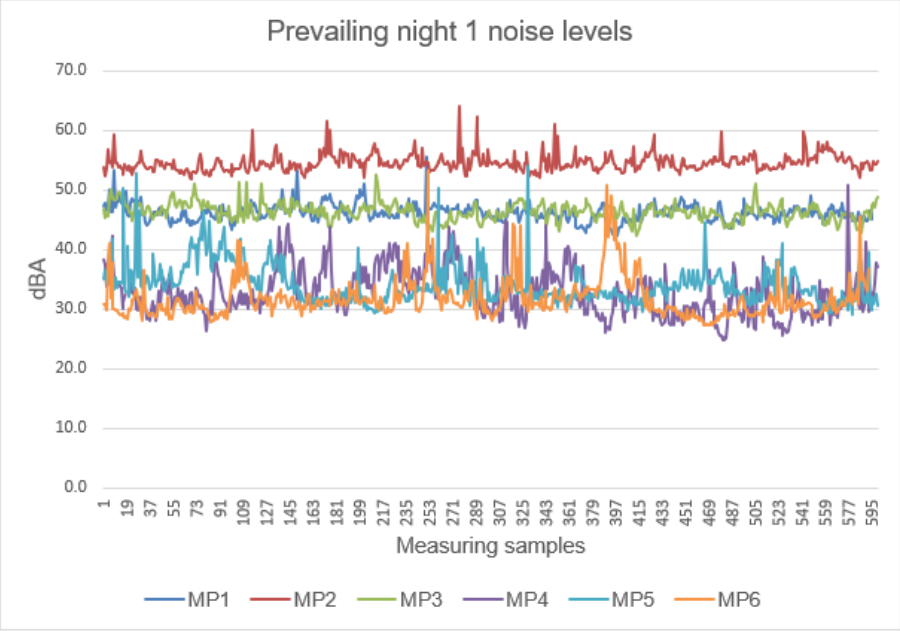


Figure 24: Prevailing ambient noise levels in the study area – night-time 1 (dBAcoustics, 2023)

Table 27: Measures noise levels for the day and night at the measuring points (dBAcoustics, 2023)

Measuring point	Daytime				Night 1				Night 2			
	LAeq-dBA	Lmax - dBA	Lmin - dBA	Remarks	LAeq-dBA	Lmax - dBA	Lmin - dBA	Remarks	LAeq-dBA	Lmax - dBA	Lmin - dBA	Remarks
1	**57.9**	81.0	51.6	Mining activities and traffic.	**54.5**	69.0	50.0	Distant mining activities.	**54.3**	64.5	48.8	Distant mining activities.
2	**44.4**	56.3	40.4	Distant alarm at mining area, Distant mine activities, people noise.	**46.4**	59.8	41.6	Distant mining activities.	**46.3**	59.5	42.9	Distant mining activities.
3	**48.0**	59.5	44.5	Distant BTT Plant and hauling vehicles.	**46.5**	58.1	41.7	Distant BTT Plant.	**50.8**	60.2	46.1	Distant BTT Plant.
4	**37.2**	56.5	28.4	Distant mining activities.	**35.1**	58.5	23.9	Distant mining activities.	**33.8**	51.4	30.0	Distant mining activities.
5	**37.0**	61.2	27.6	Distant mining activities.	**36.5**	62.1	27.5	Distant mining activities.	**40.0**	53.8	34.3	Distant mining activities.
6	**37.1**	55.0	26.9	Distant mining activities and traffic along Grame Sinclair Road.	**33.4**	59.6	26.4	Distant mining activities.	**39.1**	56.8	32.6	Distant mining activities.

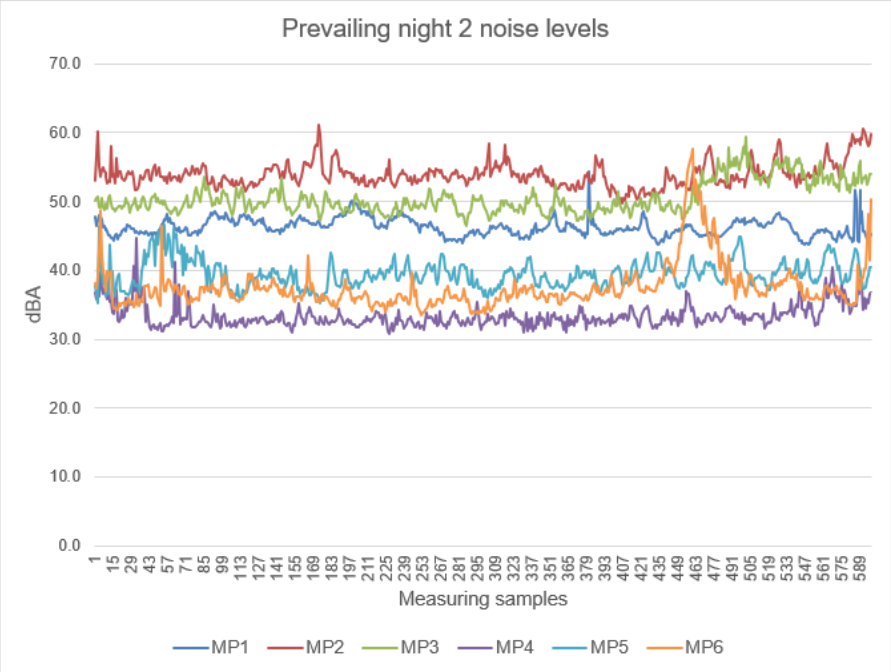


Figure 25: Prevailing ambient noise levels in the study area – night-time 2 (dBAcoustics, 2023)

10.10 Heritage

Information for this section was obtained from the Application for exemption from a Heritage Impact Assessment for the Retreatment of Eastern Platinum (Pty) Ltd (EPL) Tailings Dam 2, Marikana, North West Province Beyond Heritage, 2023). Refer to Appendix C7.

The existing Tailings Dam Complex has completely transformed the study area. Prior to this, extensive cultivation of the study area and surrounds from as early as the 1960's until recently further altered the study area and would have destroyed surface indicators if any heritage resources were present in these areas. There are no surface indicators of heritage resources, and no impact on the cultural record of the area is expected by the re-mining of the facility. General site conditions are illustrated Figure 26:.

Figure 26: General site conditions – the tailings facility has transformed the study area (Beyond Heritage, 2023)

The project area is completely transformed through the establishment of the existing Tailings Dam Complex, and the study area is considered to be of low heritage potential.

10.11 Palaeontology

Based on the South African Heritage Resoruces Agency (SAHRA) paleontological map the study area is of insignificant senstivity (Figure 27) and no further studies are required for this aspect.

Figure 27: SAHRIS palaeosensitivity map for the study area (blue polygon). Background colours indicate the following degrees of sensitivity:

Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study; a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

10.12 Socio-economic

EPL is situated within Madibeng Local Municipality. The EPL Tailings Dam Complex is situated within Ward 40.

The two main economic contributing areas within the Madibeng Local Municipality are Brits and Hartbeespoort Areas. The natural hydrology of Madibeng presents economic opportunities along the water bodies. There is increased pressure of residential developments along the Hartbeespoort Dam and the Rooikoppies Dam. The former has experienced the development pressure for longer than the latter. This is due to the scenic natural settings around the dams. The rivers on the other hand experience agricultural activity due to the favouring conditions on the river banks and areas within their proximity (MLM, 2021).

Agriculture, tourism and mining are the main primary economies. The agricultural sector, which produces food, is the biggest primary economy. It is categorized into four classifications, namely, extensive farming (44% of the Municipal area), intensive agriculture (18%), game farming (10%) and subsistence farming. Tourism also plays a major economic role as it is based on the natural systems (11%). Scenic routes, heritage sites, resorts and nature reserves are some of the main attractions in the tourism sector (MLM, 2021).

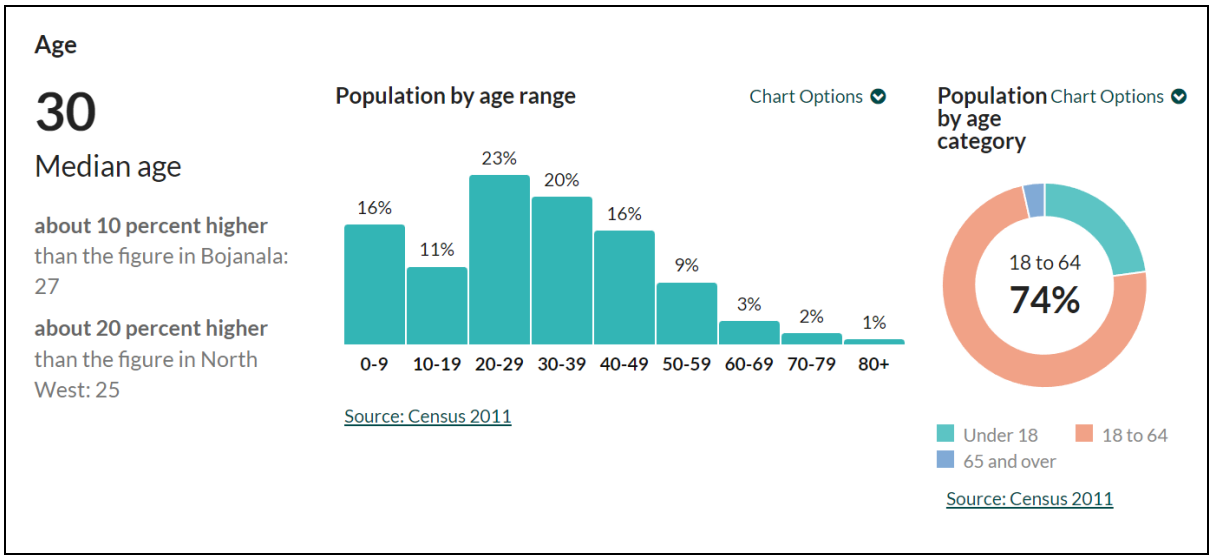
The mining sector is dominated by platinum and chromium mining as well as quarrying activity. Platinum mining activity is located on the south eastern side of Brits while quarrying is spread around the municipal area. The primary economic activities have to be managed in such a manner as to make sure that their impact on the natural environment and resources is controlled (MLM, 2021).

The following socio-economic information for Madibeng Local Municipality was obtained from Wazimap (2016 survey):

- Population of 536 111
- 92% of population is black, 7% white and 1% Indian
- 54% of the population is male
- Median age of the population is 26
- There are 193 363 housholds
- 53% of the population live in houses, 34.9% of the population live in informal dwellings (shacks)
- The average household income is R29 400 per annum
- 7.8% of the population does not have access to electricity
- 33.7% of the population has access to flush or chemical toilets, 63% of the population uses pit toilets
- 39.7% of the population are getting refuse disposal from a local authority, private company or community member, 50% of the population uses their own dump
- Employment rate is 45.4%

10.12.1 Ward 40

Ward 40 has a population of 16 978 people according to the 2011 Census. The area is 146 6 km^2, with 115.8 people per square kilometre (Wazimaps, 2023).



Population

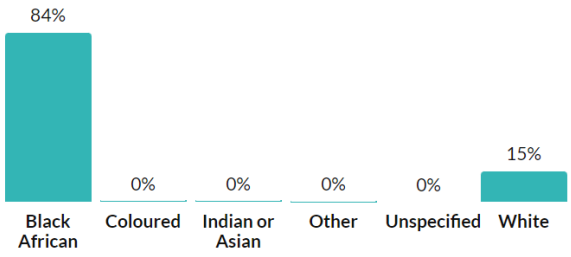
16 978

People

less than 10 percent of the figure in Bojanala: 1 507 506

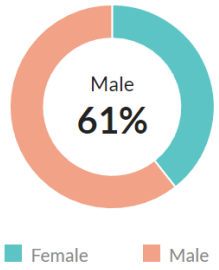
North West: 3 509 953

Population group Chart Options



Source: Census 2011

Sex Chart Options



Source: Census 2011

Language

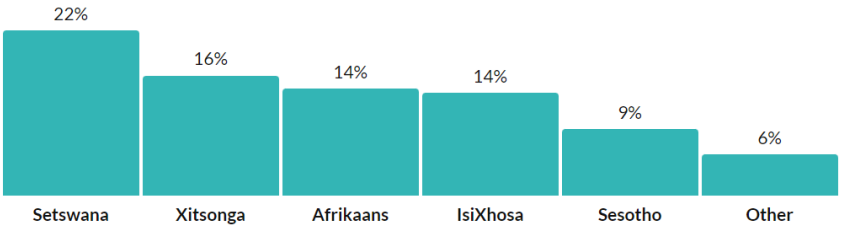
Setswana

Language most spoken at home

about two-fifths of the figure in Bojanala: 54.27

about one-third of the figure in North West: 62.43

Population by language most spoken at home Chart Options



Source: Census 2011

Households

6 745

Households

less than 10 percent of the figure in Bojanala: 523 699

less than 10 percent of the figure in North West: 1 097 610

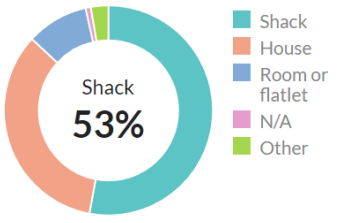
53%

Households that are informal dwellings (shacks)

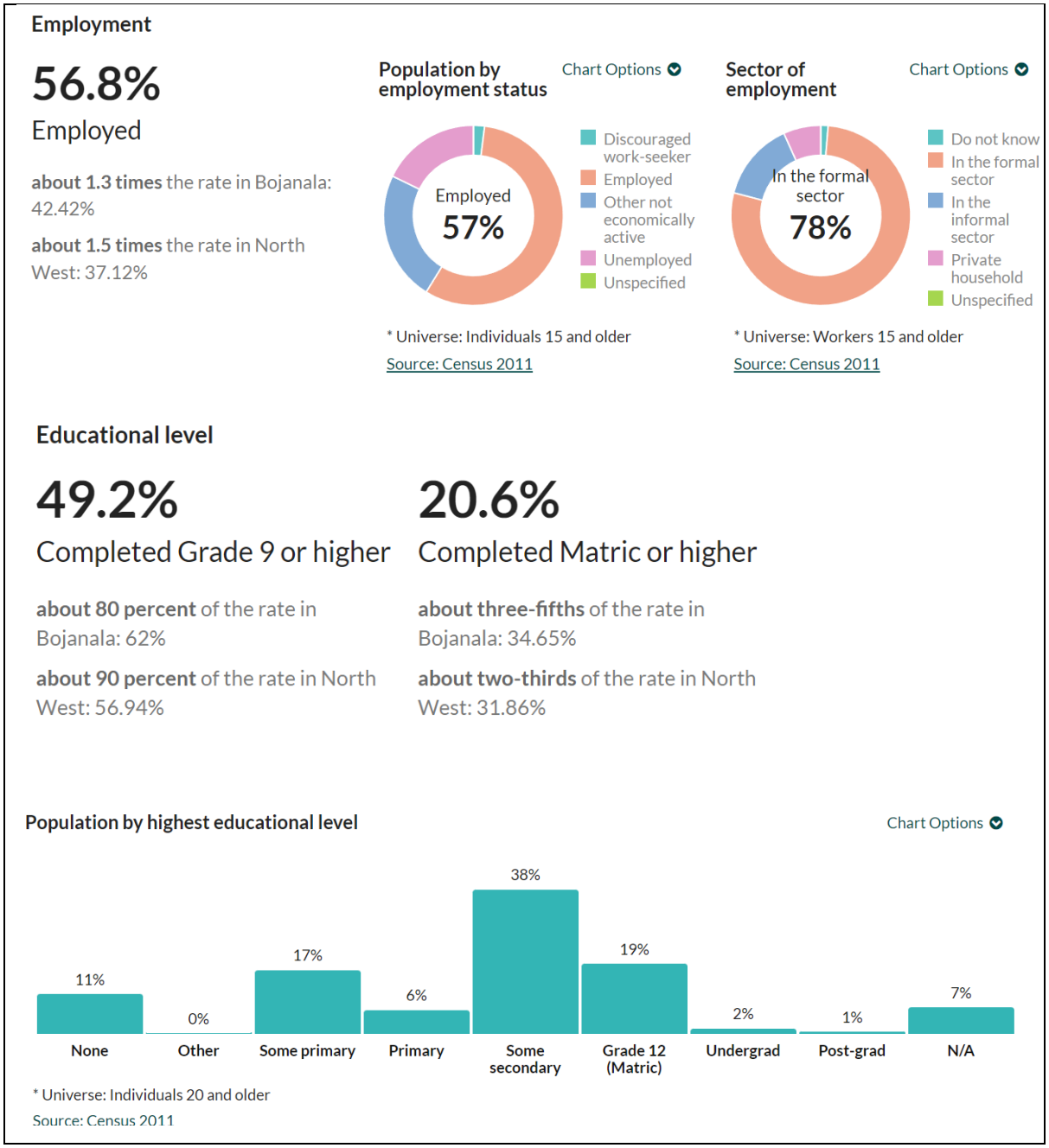
nearly double the rate in Bojanala: 28.3%

more than double the rate in North West: 20.5%

Households by type of dwelling Chart Options

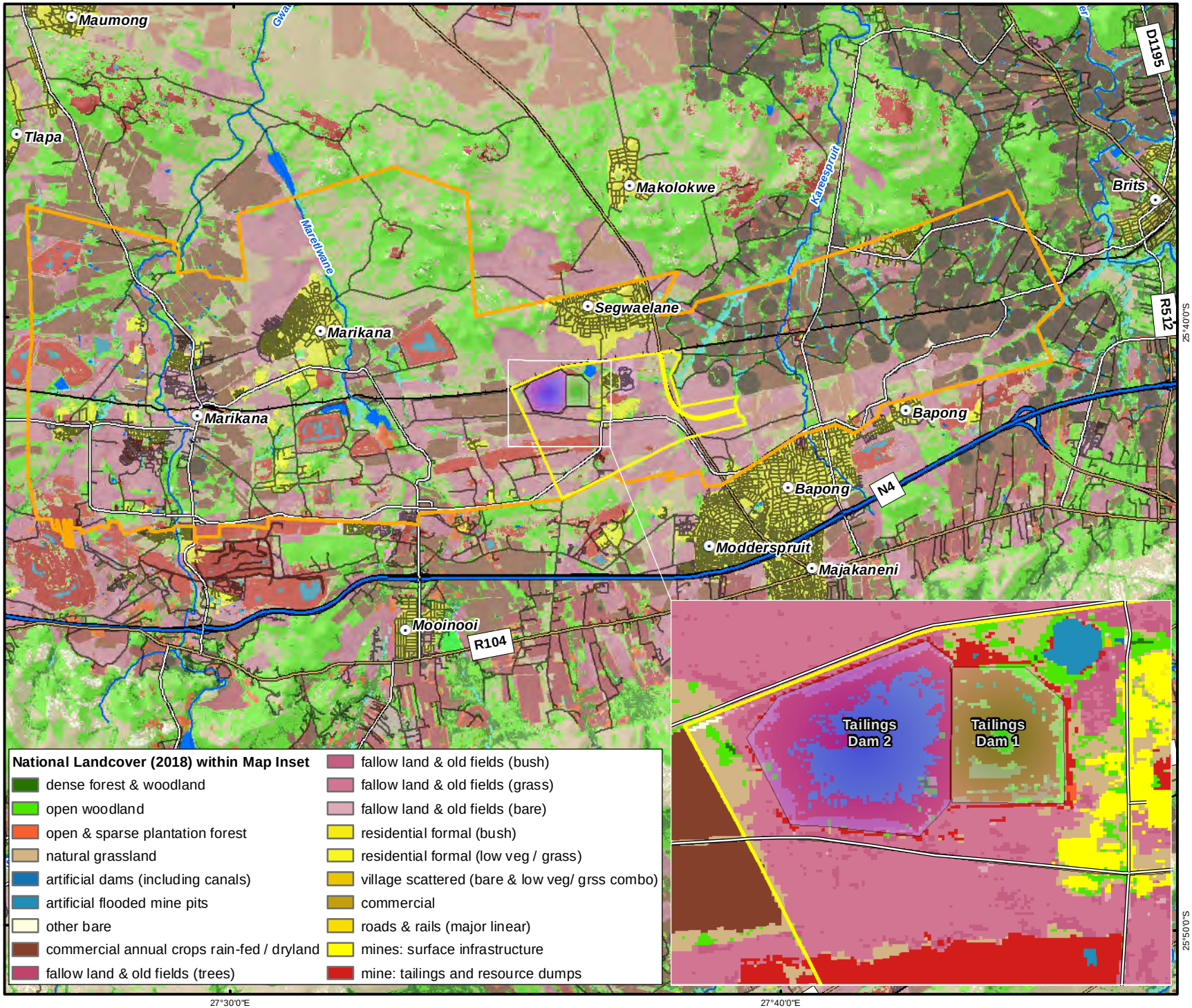


Source: Census 2011



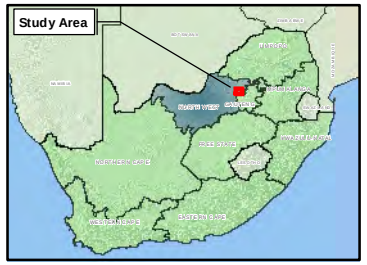
10.13 Description of the current land uses

The current land use around the EPL TD2 is fallow land and open space, mining and agriculture. Refer to Figure 28.



Legend

- Sibanye Mine Lease Boundary
- Turffontein 462 Portion 3
- Tailings Dam 1
- Tailings Dam 2
- Towns
- Railway
- Motorway
- Secondary Road
- Tertiary Road
- Street/Road
- Track
- Contours
- Rivers
- Cadastral Farms
- Water Area



SCALE: 1: 150 000

0 2 4 6

Kilometers

N

TITLE:

Landcover map of EPL Tailings Dam 1 & 2

CLIENT:

Sibanye-Stillwater

DATE: Sept 2023	PROJECT: SIBANYE_STILLWATER
DRAWN: THURLOW MAPPING	APPROVED: SVR
MAP: TD1_TD2_LANDCOVER	REV: 0

Alta van Dyk Environmental Consultants cc (2011/059764/23)

VAT No: 4630259952
Tel: 012 940 9457
Fax: 086 634 3967
Cell: 082 782 4005

Alta van Dyk Environmental

Projection: Transverse Mercator CM: 27 Datum:WGS 84
Source: Chief Directorate National Geo-Spatial Information, DFFE - South African National Land Cover 2018 dataset
DWA - NGA Geosites Inset: ESRI Data and Maps

SIZE: A4

10.14 Description of the specific environmental features and infrastructure on site

The specific environmental features around the EPL TD2 site relates to land use and vegetation and is described in Part A Section 10. In addition, the infrastructure associated with the EPL TD2 is described in Part A Section 5.2.

10.15 Environmental and current land use map

Refer to Figure 28.

11 Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts

The detailed description of the impacts and risks identified is provided in Part A Section 11.8.

The environmental impact assessment was undertaken in accordance with the impact assessment methodology as described in Part A Section 11.2. Table 35 and Table 36 includes impacts and risks identified during the basic assessment process for the proposed re-mining of EPL TD2.

11.1 National Environmental Screening Tool

In accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of NEMA, this Site Sensitivity Verification has been compiled to provide a rationale for the specialist studies undertaken as part of the environmental authorisation process. This section addresses the findings of the Screening Tool Report (Appendix E), generated from the National Web Based Environmental Screening Tool, and provides a motivation for the various specialist studies identified to be conducted.

As per the Screening Tool Report, the proposed site is located within the following areas of sensitivity:

- Agriculture: Medium sensitivity
- Animal species: Medium sensitivity
- Aquatic biodiversity: Very High sensitivity
- Archaeological and cultural heritage: Low sensitivity
- Civil aviation: High sensitivity
- Defence: Low sensitivity
- Palaeontology: Medium sensitivity
- Plant species: Medium sensitivity
- Terrestrial biodiversity: Very high sensitivity

Other than the specialist studies that have been commissioned and the impacts identified and assessed, the other specialist studies suggested by the Screening Tool Report are not considered as required for this study. A motivation is provided in Table 28.

Table 28: Specialist studies required as per the Screening Tool Report and relevant motivations

Specialist study	Included/not included	Motivation
Agricultural Impact Assessment	Included	-
Landscape/Visual Impact Assessment	Not included	Not assessed as the proposed re-mining of EPL TD2 is an existing tailings storage facility adjacent to the EPL TD1 which is currently being re-mined and processed. The re-mining of EPL TD2 will take place within an approved mining right area, adjacent to the EPL TD1 which is currently being re-mined. The surrounding area is large disturbed by infrastructure associated with the mining operation.
Archaeological and Cultural Heritage Impact Assessment	Included	Exemption from undertaking a Heritage Impact Assessment is applied for. Refer to Appendix C7.
Palaeontology Impact Assessment	Not included	According to the SAHRA paleontological sensitivity map the paleontological sensitivity of the study area is low, and no further studies are required. Refer to Part A Section 10.11.
Terrestrial Biodiversity Impact Assessment	Included	-
Aquatic Biodiversity Impact Assessment	Included	-
Hydrology Assessment	Not included	Information from the wetland report will be used for the surface water section.
Noise Impact Assessment	Included	-
Radioactivity Impact Assessment	Not included	A radioactivity impact assessment is not required as the material being mined (PGMs) is not considered radioactive.
Traffic Impact Assessment	Not included	Not required
Geotechnical Assessment	Not included	A geotechnical assessment will be undertaken prior to the commencement of re-mining if required.
Climate Impact Assessment	Not included	A specific Climate Impact Assessment will not be undertaken, but the climate will be assessed in the Air Quality Impact Assessment.
Health Impact Assessment	Not included	A specific Health Impact Assessment is not required at this stage as Air Quality and Noise impact assessments are undertaken
Socio-Economic Assessment	Not included	The positive and negative socio-economic impacts of the proposed re-mining of EPL TD2 are assessed in the Basic Assessment Report. It is not deemed necessary that a separate Socio-Economic Assessment be undertaken at this time.

Specialist study	Included/not included	Motivation
Ambient Air Quality Impact Assessment	Included	-
Seismicity Assessment	Not included	No blasting will be undertaken, therefore a seismicity assessment is not required.
Plant Species Assessment	Included	-
Animal Species Assessment	Included	

11.2 Methodology used in determining the significance of the environmental impacts

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

Table 29: Scale utilised for the evaluation of the Environmental Risk Ratings

Evaluation Component	Rating Scale and Description/criteria
MAGNITUDE of negative impact (at the indicated spatial scale)	**10 - Very high**: Bio-physical and/or social functions and/or processes might be *severely* altered. **8 - High**: Bio-physical and/or social functions and/or processes might be *considerably* altered. **6 - Medium**: Bio-physical and/or social functions and/or processes might be *notably* altered. **4 - Low** : Bio-physical and/or social functions and/or processes might be *slightly* altered. **2 - Very Low**: Bio-physical and/or social functions and/or processes might be *negligibly* altered. **0 - Zero**: Bio-physical and/or social functions and/or processes will remain *unaltered*
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	**10 - Very high (positive)**: Bio-physical and/or social functions and/or processes might be *substantially* enhanced. **8 - High (positive)**: Bio-physical and/or social functions and/or processes might be *considerably* enhanced. **6 - Medium (positive)**: Bio-physical and/or social functions and/or processes might be *notably* enhanced. **4 - Low (positive)**: Bio-physical and/or social functions and/or processes might be *slightly* enhanced. **2 - Very Low (positive)**: Bio-physical and/or social functions and/or processes might be *negligibly* enhanced. **0 - Zero (positive)**: Bio-physical and/or social functions and/or processes will remain *unaltered.*
DURATION	**5 - Permanent** **4 - Long term**: Impact ceases after operational phase/life of the activity > 20 years. **3 - Medium term**: Impact might occur during the operational phase/life of the activity – 20 years. **2 - Short term**: Impact might occur during the construction phase - < 3 years. **1 - Immediate**
EXTENT (or spatial scale/influence of impact)	**5 - International**: Beyond National boundaries. **4 - National**: Beyond Provincial boundaries and within National boundaries. **3 - Regional**: Beyond 5 km of the proposed development and within Provincial boundaries. **2 - Local**: Within 5 km of the proposed development. **1 - Site-specific**: On site or within 100 m of the site boundary. **0 -** None

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

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

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

The maximum Significance Score value is 150.

The Significance Score is then used to rate the Environmental Significance of each potential environmental impact as per Table 30 below. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

Table 30: Scale used for the evaluation of the Environmental Significance Ratings

Significance Score	Environmental Significance	Description/criteria
125 – 150	**Very high (VH)**	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	**High (H)**	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	**Medium-high (MH)**	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked

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

11.3 The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected

The positive and negative implications of the proposed re-mining of EPL TD2 are provided in Table 35 and Table 36.

11.4 The possible mitigation measures that could be applied and the level of risk

The possible mitigation measures are addressed in the impact tables which follow in this section (11.8).

11.5 Motivation where no alternatives sites were considered

Alternatives considered are detailed in Part A Section 8.

11.6 Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site

A summary of all the anticipated impacts and risks, as well as significance for the proposed project during the life of the project have been included in Table 35 and Table 36. Mitigation measures associated with each impact and risk are also included. Impacts and risks were identified using a standardised method that forms part of methodology that the EAP utilised (Part A Section 11.2) for the EIA and EMP. This process involved:

- Observations based on the site visits;
- Input from the specialist studies, baseline assessments and recommendations;
- Input from the desktop analysis of relevant sector plans and available land use planning tools;
- Consultation and discussions with the engineering project team;
- Application of previous knowledge and experience by the EAP for environmental impact assessment in the Limpopo region;
- Assessment of impacts using the impact assessment methodology as described Part A Section 11.2. The assessment of significance was undertaken twice. Initial significance was based only on natural and existing mitigation measures. The subsequent assessment took into account the recommended management measures required to mitigate the impacts.

11.7 Assessment of each identified potentially significant impact and risk

Refer to Table 35 and Table 36 for the assessment of identified impacts and risks of the proposed re-mining of EPL TD2.

The sections below provide modelling results of the impacts to be expected.

11.7.1 Wetlands

Based on the provided project information, the proposed project activity will not infringe directly on wetland habitat. TD2 does lie within the 500m regulated area of a small, and potentially artificially maintained, depression immediately north of the Marikana – Brits railway line. However, the catchment of this depression extends to the northwest, and the TD2 lies outside of the depression's catchment, as shown in Figure 13.

The following are important factors to bear in mind when considering potential impacts and risks of the proposed TD2 tailings remining to wetlands in the surrounding landscape:

- This project will not require the construction of any new infrastructure, and all activities will remain within the footprints of existing, authorised mine infrastructures.
- The tailings dams lie within an existing dirty water area, and any runoff from these infrastructures reports to the RWD to the northeast. Accumulated dirty water in the RWD is reused and will be used as the water source for the remining, where necessary.
- All conveyance of material/remined slurry will occur in existing pipelines. No new pipelines will be constructed.
- The remining of TD2 will commence once current (and authorised) remining of TD1 ceases, therefore, the remining of TD2 will essentially be a continuation of the current tailings remining activity taking place at TD1.

The remining of TD2 will essentially only represent a continuation of the tailings remining activity currently taking place at the adjacent EPL TD1, therefore, and taking into account the aforementioned factors, no new impacts or threats to the surrounding watercourses are anticipated as a result of the remining of TD2. If the remining of TD1 is currently having any negative impact to downstream watercourses, remining of TD2 will only represent a continuation of these impacts/risks, and not an increase in the magnitude of the impacts/risks.

Possible impacts to surrounding or downstream wetlands and watercourses that may be occurring as a result of remining at TD1, and which would therefore continue as a result of remining of TD2 include exposure of tailings material to increased risk of mobilization in surface runoff from the tailings dam, and leakages or spillages from pipelines conveying tailings material/slurry. Surface runoff from the tailings dam is considered to be dirty water, and if allowed to drain to the valley bottom wetlands downstream and to the east of the RWD, would constitute a pollution source and would potentially negatively impact water quality (both in terms of elevated turbidity brought about by suspended tailings sediment, and the constituents). However, as the tailings dam forms part of a closed, dirty water area, all surface runoff from the TD2 will report to the RWD where, assuming that the capacity of the RWD is sufficient, it will be stored indefinitely and reused within the dirty water area.

11.7.2 Groundwater

The potential source, the tailings storage facility, is proposed to be removed and rehabilitated. Constituents of concern from tailings include Total Dissolved Solids (TDS) and sulphates (SO_4).

Contamination can arise from leaching of these constituents during re-mining into the soil and groundwater during the event of a spill or leakage from the infrastructure. Since the slurry is pumped from the tailings dam via an overland pipeline to the UG2 concentrator for processing, the probability of leakage is low.

The average groundwater level is 5.31 mbgl and ranges between 0.5 – 8.32 mbgl. Groundwater typically occurs in the shallow weathered zone aquifer (20 m) and deeper fractured bedrock aquifer (80 m). The aquifers have low permeability which is significantly increased in areas where faulting and/or intrusive dykes occur. Recharge of the aquifers is low (approximately 1-3%), due to the small fluctuation in groundwater levels seasonally and the geological environment (Water Hunters, 2019) (Geostratum, 2023).

The groundwater flow is generally towards the north west but localized towards the two major streams i.e. Maretlwana and the Kareespruit.

Based on the groundwater flow gradients in the vicinity of the tailings dam area, borehole localities SD-BH1 and SL-BH1 would be upgradient of the tailings dam (~2km north east). The boreholes were located at the Segwaelane and Sedupe Primary Schools, however SD-BH1 was abandoned and SL-BH1 was used for irrigation of vegetables during the hydrocensus done in 2019 by Water Hunters.

Based on the 1:250 000 geological map, a major fault traverses through the tailings dam with a strike direction from north west to south east and could act as preferential flow path for groundwater flow from the tailings dam.

11.7.3 Air Quality – dispersion model results

The maximum predicted PM_{10} and $PM_{2.5}$ concentrations and the maximum predicted total suspended particles (TSP) deposition resulting from emissions from mining and haul roads associated with the proposed mechanical re-mining of TD2 at the EPL is presented in Table 31. The PM_{10} and $PM_{2.5}$ predicted annual average and the 99th percentile of the predicted 24-hour concentrations as well as the TSP deposition are also presented as isopleth maps (or isopleth plots).

Table 31: Maximum predicted PM_{10} and $PM_{2.5}$ concentrations in µg/m^3 and maximum dust fallout in mg/m^2/day (uMoya, 2023)

	Operational Phase		
Parameter	**Exposure period**	**Concentration**	**Limit Value**
PM_{10}	Annual	19.2	40
	24-hour	39.4	75
$PM_{2.5}$	Annual	4.5	20
	24-hour	9.2	40
	Exposure period	**Dust Fallout**	**Limit Value**
Dust fallout	30-day	33.3	Residential D < 600 Non-residential 600 < D < 1 200

11.7.3.1 Predicted PM_{10} concentrations

Annual Concentrations

The predicted annual PM_{10} concentrations resulting from emissions from mining and haul roads associated with the proposed re-mining of TD2 at the EPL are shown in Figure 29. The emissions from haul roads and wind erosion at TD2 strongly influence the dispersion pattern with the highest concentrations in the vicinity of TD2.

The highest predicted concentration of 19.2 µg/m^3 is below the National Ambient Air Quality Standard (NAAQS) of 40 µg/m^3 and occurs a little to the north of TD2. Predicted ambient concentrations are well below the NAAQS throughout the rest of the surrounding environment and no exceedances are predicted in the nearby residential areas.

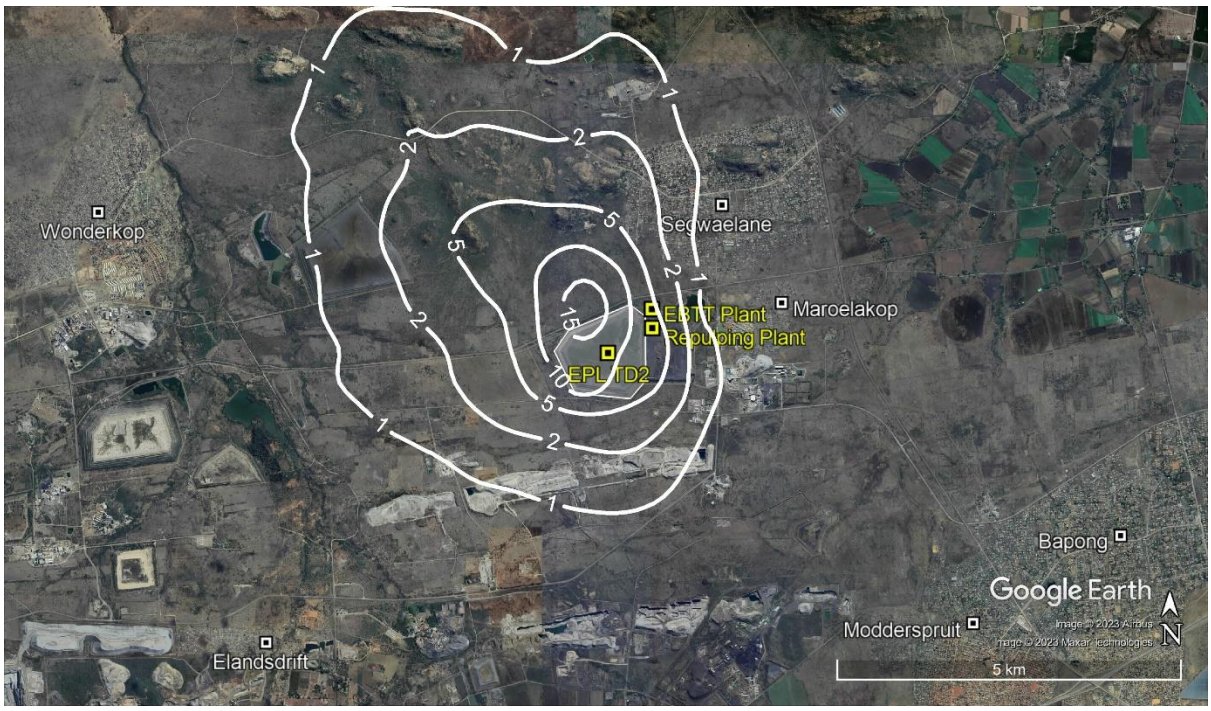


Figure 29: Predicted ambient annual average PM_{10} concentrations in µg/m³ resulting from the proposed re-mining of TD2 at the EPL (uMoya, 2023)

24-hour concentrations

The 99th percentile of the maximum predicted 24-hour PM_{10} concentrations resulting from emissions from mining and haul roads associated with the proposed re-mining of TD2 at the EPL are shown in Figure 30. The emissions from haul roads and wind erosion at TD2 strongly influence the dispersion pattern with the highest concentrations in the vicinity of TD2.

The highest predicted concentration of 39.4 µg/m³ is below the NAAQS of 75 µg/m³ and occurs a little to the north of TD2. Predicted ambient concentrations are well below the NAAQS throughout the rest of the surrounding environment and no exceedances are predicted in the nearby residential areas.

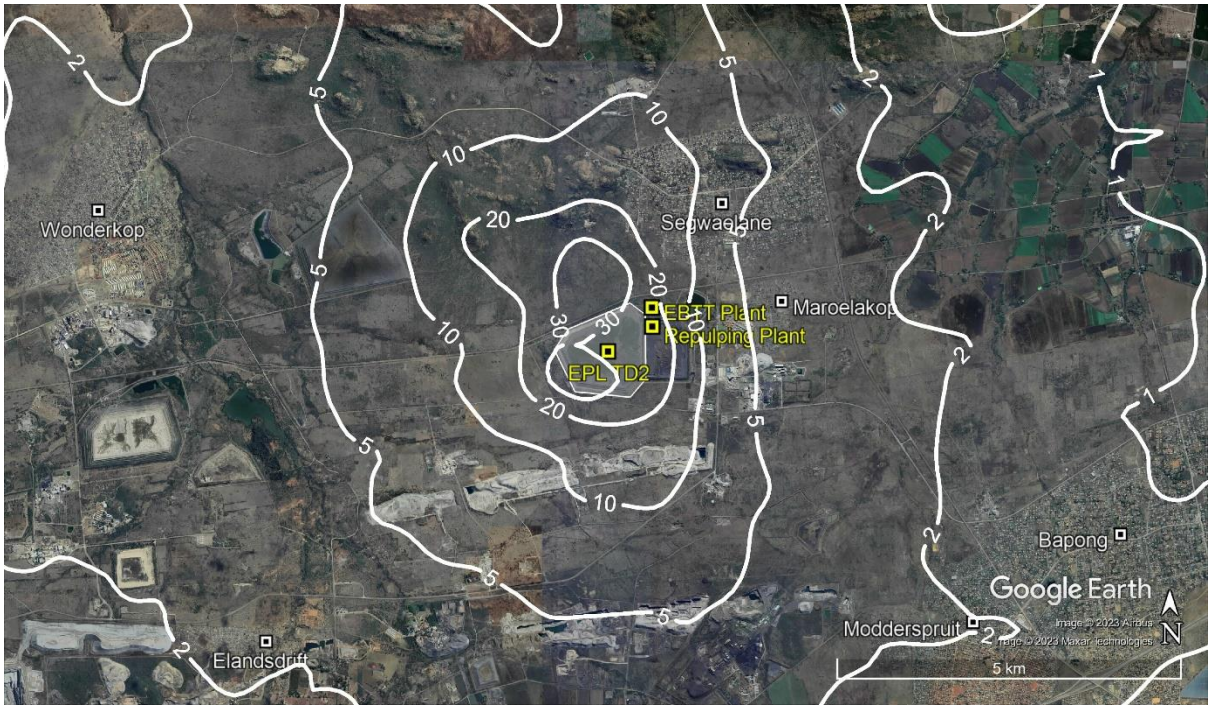


Figure 30: Predicted ambient 24-hour PM_{10} concentrations in µg/m³ resulting from the proposed re-mining of TD2 at the EPL (uMoya, 2023)

11.7.3.2 Predicted $PM_{2.5}$ concentrations

Annual concentrations

The predicted annual $PM_{2.5}$ concentrations resulting from emissions from mining and haul roads associated with the proposed re-mining of TD2 at the EPL are shown in Figure 31. The emissions from haul roads and wind erosion at TD2 strongly influence the dispersion pattern with the highest concentrations in the vicinity of TD2.

The highest predicted concentration of 4.5 µg/m3 is well below the NAAQS of 20 µg/m³ and occurs a little to the north of TD2. Predicted ambient concentrations are well below the NAAQS throughout the rest of the surrounding environment and no exceedances are predicted in the nearby residential areas.

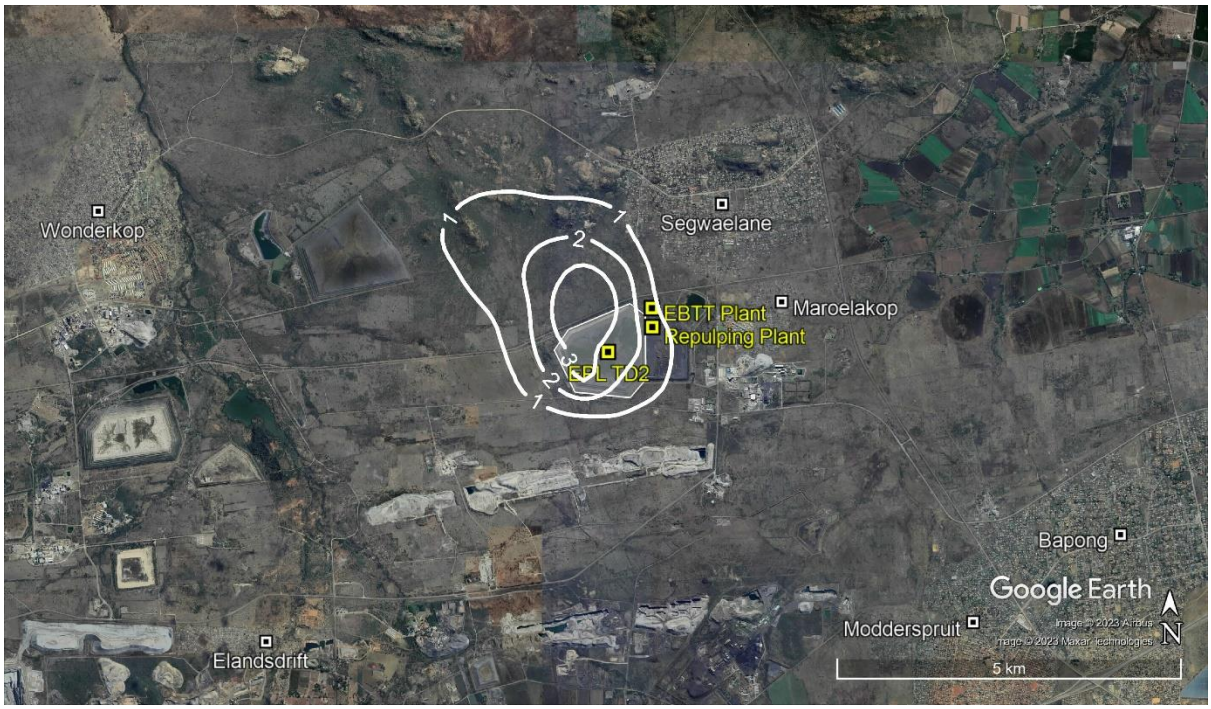


Figure 31: Predicted ambient annual average $PM_{2.5}$ concentrations in µg/m³ resulting from the proposed re-mining of TD2 at the EPL (uMoya, 2023)

24-hour concentrations

The 99th percentile of the maximum predicted 24-hour $PM_{2.5}$ concentrations resulting from emissions from mining and haul roads associated with the proposed re-mining of TD2 at the EPL are shown in Figure 9 4. The emissions from haul roads and wind erosion at TD2 strongly influence the dispersion pattern with the highest concentrations in the vicinity of TD2.

The highest predicted concentration of 9.2 µg/m³ is well below the NAAQS of 40 µg/m³ and occurs a little to the north of TD2. Predicted ambient concentrations are well below the NAAQS throughout the rest of the surrounding environment and no exceedances are predicted in the nearby residential areas.

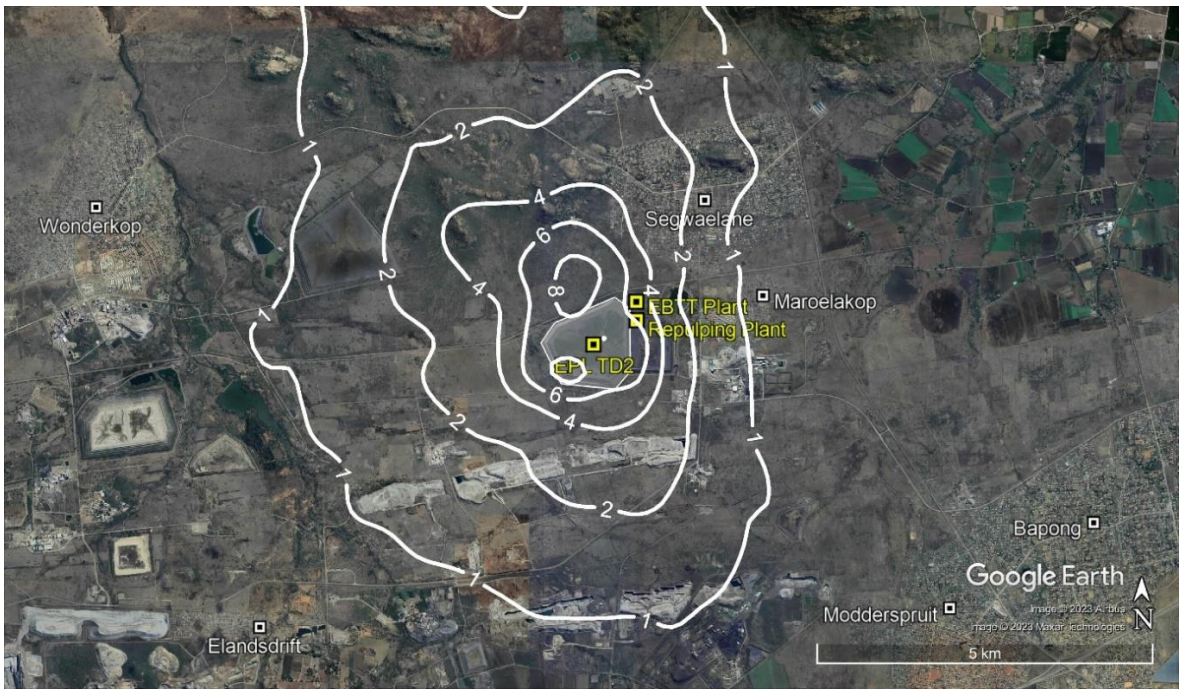


Figure 32: Predicted ambient 24-hour $PM_{2.5}$ concentrations in µg/m³ resulting from the proposed re-mining of TD2 at the EPL (uMoya, 2023)

11.7.3.3 Predicted TSP deposition

The predicted dust fallout resulting from emissions from mining and haul roads associated with the proposed re-mining of TD2 at the EPL are shown in Figure 33. The emissions from haul roads and wind erosion at TD2 strongly influence the dispersion pattern with the highest dust fallout in the vicinity of TD2.

The highest predicted dust fallout of 33.3 mg/m²/day occurs a little to the north of TD2 and is well below the dust fallout standard of 600 mg/m²/day for residential areas and 1 200 mg/m²/day for non-residential areas. The predicted dust fallout is well below the standard throughout the rest of the surrounding environment and no exceedances are predicted in the nearby residential areas.

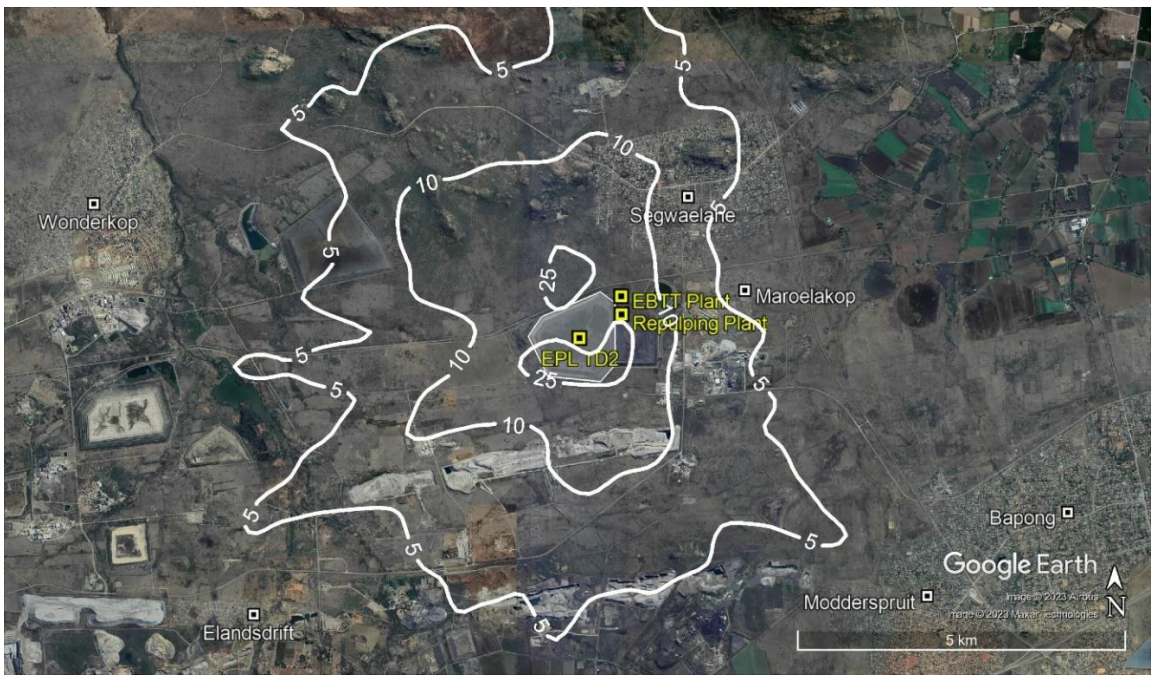


Figure 33: Predicted TSP Deposition in mg/m²/day resulting from the proposed re-mining of TD2 at the EPL (uMoya, 2023)

11.7.4 Noise

The following formula was used to calculate the noise level at the noise sensitive areas during the operational phase:

Lp = Lw - 20log R - 5dB

- Lp is the sound level at a distance from the source in dBA;
- Lw is the sound level at the source in dBA; and
- R is the distance from the source.

The following sound levels were used in determining the noise intrusion level during the operational phase of the mining activities:

- Activities at the BTT Plant – 90.0dBA;
- Hauling vehicles to the BTT Plant – 82.5dBA;
- Hydraulic pump activities – 89.0dBA;

The noise levels at the noise sensitive areas will be added in a logarithmic manner to determine the overall sound exposure at the receptor. The following formula will be used to categorize the intrusion levels during the construction and operational phases. The increase in the prevailing ambient noise level is calculated in the following manner:

Δ LReq,T = LReq,T (post) - LReq,T (pre)

where,

LReq,T (post) – noise level after completion of the project – projected or calculated noise levels;

LReq,T (pre) – noise level before the proposed project – ambient noise level.

The criterion for assessing the magnitude of a noise impact is illustrated in Table 32.

Table 32: Noise intrusion level criteria

Increase Δ-dBA	Assessment of impact magnitude	Color code
0 <Δ≤ 1	Not audible	
1 <Δ≤ 3	Very Low	
3 <Δ≤ 5	Low	
5 <Δ≤ 10	Medium	
10 <Δ≤ 15	High	
15 <Δ	Very High	

11.7.4.1 Noise impacts during the operational phase

The calculated noise levels and subsequent noise intrusion levels at the abutting noise receptors during the operational phase of the project at the different areas within the mining boundaries are illustrated in Table 33. The threshold value of 7.0dBA will not be exceeded.

Table 33: Noise intrusion levels (in dBA) during the operational phase

Residential property	Activities at BTT Plant	Hauling vehicles to the BTT Plant	Hydraulic pump activities	Cumulative Levels	Cumulative noise level Daytime	Cumulative noise level – Night-time	Intrusion noise level - Daytime	Intrusion noise level – Night-time
A	28.8	19.6	27.3	31.4	44.6	46.4	**0.2**	**0.1**
B	26.6	22.2	25.1	29.8	44.5	46.4	**0.1**	**0.1**
C	23.2	16.1	21.7	26.0	44.5	46.3	**0.1**	**0.0**
Northern boundary	32.6	18.3	36.1	37.8	40.5	39.3	**3.3**	**5.3**
Western boundary	32.4	14.6	35.9	37.5	40.3	40.8	**3.3**	**2.8**
Southern boundary	31.5	17.3	35.0	36.6	39.9	39.4	**2.8**	**3.3**

11.7.4.2 Noise impacts during rehabilitation and closure

The calculated noise levels and subsequent noise intrusion levels at the abutting noise receptors during the rehabilitation phase of the project at the different areas within the mining boundaries are illustrated in Table 34. The threshold value of 7.0dBA will not be exceeded during the rehabilitation phase.

Table 34: Noise intrusion levels (in dBA) during the rehabilitation and closure phase

Residential property	Removal of all infra-structure	Removal of BTT Plant	Planting of grass	Cumulative Levels	Cumulative noise level -	Cumulative noise level –	Intrusion noise level - daytime	Intrusion noise level – night-
A	20.8	20.6	20.6	23.7	44.4	46.3	**0.0**	**0.0**
B	18.6	20.2	20.2	22.5	44.4	46.3	**0.0**	**0.0**
C	15.2	15.6	15.6	18.4	44.4	46.3	**0.0**	**0.0**

Table 35: Assessment of identified potential impacts of the proposed EPL TD2 during the operational phase

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								Cumulative	Status	RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance				Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance
Geology																				
Re-mining of EPL TD2	The proposed activities associated with the re-mining of EPL TD2 are not anticipated to have an impact on the local geology of the project area.																			
Soils																				
Re-mining of EPL TD2	No additional soil impacts are expected during the operational phase, as the EPL TD2 is an existing facility and no new surface infrastructure will be constructed.																			
Terrestrial biodiversity																				
Re-mining of EPL TD2	**Degradation of habitats and ecosystems** The deterioration of the habitats are expected due to the increase of dust and edge effect impacts. Dust reduces the ability of plants to photosynthesize and thus leads to degradation/retrogression of the veld.	4	3	2	2	2	3	39	L	Low	Negative	• Avoid the further disturbance or destruction of areas outside of the development footprint. Rehabilitate areas as soon as they are no longer impacted by operational activities. • The rehabilitated areas must be revegetated with indigenous vegetation.	2	2	1	1	1	2	14	L
Re-mining of EPL TD2	**Spread of alien and/or invasive species** If left unchecked, alien/invasive plant species will continue to grow and spread prolifically leading to further and more significant deterioration to the health of the natural environment within the project area.	2	3	2	2	2	3	33	L	Low	Negative	• Implementation of an alien vegetation management plan. • Regular monitoring for alien invasive plants encroachment during the operation phase to ensure that no alien invasion problems have developed as result of the disturbance	2	2	1	1	1	2	14	L
Wetlands																				
Re-mining of EPL TD2	**Water quality deterioration** Remining of the TD2 tailings material and mobilisation of potentially polluting material to the downstream wetlands in surface runoff	2	3	3	1	2	3	33	L	Medium	Negative	• All remining activities must remain within the footprint of TD2, and no additional infrastructures may be built to convey the remined material and slurry. • The capacity of tailings dams, and their associated RWDs, receiving remined slurry must be sufficient to cater for the additional inputs. • It must be ensured that the dirty water area within which the TD2 lies remains completely closed and that there is no transfer of dirty water from the dirty water system to the environment (clean water area) during normal operating conditions. • The capacity of the return water dam must be maintained, and inputs should not exceed its capacity such that overflow to the environment occurs more frequently than the 1:50-year flood event. • A detailed spill management and rehabilitation plan (as part of the Standard Operating Procedure – SOP) must be compiled by a suitably qualified specialist or specialist team in advance of the remining to deal with possible spill scenarios (from the dirty water area, RWD and associated infrastructure). This plan must include a failure response plan and must detail timeframes for response, management and rehabilitation as well as the responsible persons. The SOPs should preferably be signed off by the relevant environmental authorities.	2	3	2	1	1	2	18	L

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								Cumulative	Status	RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance				Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance
												• Ensure all infrastructures remain in a good state of repair to limit the risk of accidental leaks or spills. • All pipelines conveying slurry/tailings material must be regularly monitored, particularly at wetland and watercourse crossings, to ensure that any leaks or pipe bursts are addressed rapidly.								
Groundwater																				
Re-mining of EPL TD2	**Impacts on groundwater quality** Spillage of slurry between TD, overland pipeline and the UG2 concentrator (processing facility). Seepage into underlying aquifer.	4	3	1	2	1	2	22	L	Medium	Negative	• Maintenance and regular inspection of infrastructure and pipeline to ensure no leakages or spillages. • Continue with groundwater monitoring as per existing WULA requirements and the existing groundwater monitoring routine.	2	2	1	1	1	2	14	L
Noise																				
Re-mining of EPL TD2 Activities at BTT Plant Hauling vehicles to the BTT Plant Hydraulic pump activities	**General rise in ambient noise levels** A general rise in ambient noise levels are expected during the operational phase. The proposed TD2 remining project will take place in an area where there are other mining activities and feeder roads with a continuous flow of traffic during the day and intermittent traffic flow during the night. The prevailing ambient noise level in the vicinity of the proposed project area was made up out of traffic, domestic, distant mining activities, birds, and insect noises. The noise intrusion levels during the operational phase at all residential areas are less than 5dB, which is of low magnitude.	4	3	1	2	1	4	44	M	Low	Negative	• Re-mining activities to take place during daylight hours. • A complaints register must be available at the mine. Complaints must be attended to immediately as per the mine's Grievance Procedure. • Noise monitoring must be undertaken when noise complaints are received. • All operational equipment, vehicles and machinery must be regularly serviced to prevent excessive noise. • Vehicles and equipment generating excessive noise should be fitted with appropriate noise abatement measures. • Personal working on site should be provided Personal Protective Equipment and must be worn at all times. • All noise sources within the footprint boundaries in excess of 85.0dBA must be acoustically screened off.	2	3	1	2	1	4	36	L
Air Quality																				

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								Cumulative	Status	RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance				Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance
Re-mining of EPL TD2	**Increase in dust fallout** The predicted dust deposition is low and well below the limit value for acceptable dust fallout in non-residential areas. The impact of exposure of dust on vegetation is through deposition on leaf surfaces and inhibiting transpiration. The predicted dust fallout is low and localised. With no irreplaceable resources in the zone of impact, there is deemed to be a very low or no potential for the loss of irreplaceable resources. If the impacts described occur, they will be reversible if exposure ceases.	4	2	1	1	1	2	18	L	Low	Negative		2	2	1	1	1	2	14	L
Re-mining of EPL TD2	**Increase in respirable particulates** Predicted ambient PM_{10} and $PM_{2.5}$ concentrations are low and well below the respective NAAQS throughout the surrounding environment and nearby residential areas, and also low in the vicinity of TD2. There are no exceedances of the annual average and 24-hour NAAQS for PM_{10} and $PM_{2.5}$ throughout the study area. Domestic wood burning and other mining activities are the only other source of PM_{10} and $PM_{2.5}$ in the area. The extent of the predicted impact is localised. It is therefore unlikely that emissions from activities resulting from the proposed re-mining of TD2 at the EPL will add significantly to ambient concentrations beyond the mining area. The cumulative impact is therefore considered to be negligible and is scored low.	4	2	1	1	1	2	18	L	Low	Negative	• Continue with current dust control measures, i.e. spraying of mine roads and haul road. • Continue with current monthly dust fallout monitoring programme. • Continue with strict enforcement of speed limits on all mine roads.	2	2	1	1	1	2	14	L
Heritage																				

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								Cumulative	Status	RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance				Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance
Re-mining of EPL TD2	**Impact on Archaeological Resource** The project area is completely transformed through the establishment of the existing tailings dam complex, and the study area is considered to be of low heritage potential. This was confirmed during the site visit, and no evidence of heritage resources was noted.	As the EPL TD2 is an existing facility and no new infrastructure will be constructed, and due to the lack of any heritage finds, no impact on heritage resources are expected during the operational phase.																		
Social																				
Re-mining of EPL TD2	**Benefits resulting from employment and income opportunities created by the re-mining of EPL TD2**	4	2	2	2	1	3	33	L	Low	Positive	• Develop a clear and concise employment policy prioritising local employment • Employ local workers if qualified applicants with the appropriate skills are available. • Purchase goods and services at a local level if available	6	2	2	2	1	4	52	M

Table 36: Assessment of identified potential impacts of the proposed re-mining of EPL TD2 during the closure phase

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								Cumulative	Status	RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance				Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance
Geology																				
Rehabilitation of re-mined TD2 area	The proposed activities associated with the rehabilitation of EPL TD2 are not anticipated to have an impact on the local geology of the project area.																			
Soils																				
Rehabilitation of re-mined TD2 area	No significant negative impacts are envisaged during the Closure and Decommissioning Phase.																			
Terrestrial biodiversity																				
Rehabilitation of re-mined TD2 area	**Spread of alien and/or invasive species** If left unchecked, alien/invasive plant species will continue to grow and spread prolifically leading to further and more significant deterioration to the health of the natural environment within the project area.	2	3	2	2	2	3	33	L	Low	Negative	• Implementation of an alien vegetation management plan. • Regular monitoring for alien invasive plants encroachment during the operation phase to ensure that no alien invasion problems have developed as result of the disturbance	2	2	1	1	1	2	14	L
Wetlands																				
Rehabilitation of re-mined TD2 area	No significant negative impacts are envisaged during the Closure and Decommissioning Phase.																			
Groundwater																				
Rehabilitation of TD2 area	**Improvement of groundwater quality** Due to re-mining the source of contamination (constituents of concern include SO_4 and TDS) will be removed, therefore a positive impact on groundwater quality is expected. Contamination can arise from leaching of slurry during re-mining into the soil and groundwater during the event of a spill or leakage from the infrastructure. Since the slurry is pumped from the tailings dam via an overland pipeline to the UG2 concentrator for processing, the probability of leakage is low.	4	5	1	4	4	4	72	M	Low	Positive (+)	A positive impact on the environment is expected. No mitigation required	2	5	1	1	3	2	24	L

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								Cumulative	Status	RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance				Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance
Rehabilitation of TD2 area	**Decrease of groundwater levels to ambient groundwater level** An increase of groundwater levels was caused by the tailings dam. During re-mining this will continue, however a decrease of groundwater levels within the weathered zone aquifer is expected once re-mining is complete.	4	5	1	4	4	4	72	M	Low	Positive (+)	A positive impact on the environment is expected. No mitigation required	2	5	1	1	3	2	24	L
Air Quality																				
Rehabilitation of TD2 area	**Increase in ambient TSP, PM_{10} and $PM_{2.5}$ concentrations** Dust generated through the closure activities will be generally coarse and impacts will manifest as a nuisance rather than a health issue. The magnitude of the impact is likely to be very low.	2	2	1	1	1	2	14	L	Low	Negative	• Continue with current dust control measures, i.e. spraying of mine roads and haul road • Continue with current monthly dust fallout monitoring program • Continue with strict enforcement of speed limits on all mine roads	2	2	1	1	1	2	14	L
Noise																				
Rehabilitation of TD2 area	**Impact on ambient noise levels** Noise increase in excess of the threshold value for a noise disturbance of 7.0dBA above the ambient noise level at the boundary of the mine footprint and at the abutting residential areas	4	3	1	2	1	4	44	M	Low	Negative	• Decommissioning and closure (rehabilitation) activities to take place during daylight hours. • A complaints register must be available at the mine. Complaints must be attended to immediately as per the mine's Grievance Procedure. • Noise monitoring must be undertaken when noise complaints are received. • All equipment, vehicles and machinery must be regularly serviced to prevent excessive noise. • Vehicles and equipment generating excessive noise should be fitted with appropriate noise abatement measures. • Personal working on site should be provided Personal Protective Equipment and must be worn at all times. • All noise sources within the footprint boundaries in excess of 85.0dBA must be acoustically screened off.	2	3	1	2	1	4	36	L
Heritage																				
Rehabilitation of TD2 area	Due to the lack of any heritage finds, no impact on heritage resources are expected during the decommissioning and closure phase.																			
Social																				

ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION								Cumulative	Status	RECOMMENDED MITIGATION MEASURES/ REMARKS	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION							
		Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance				Magnitude	Duration	Extent	Irreplaceability	Reversibility	Probability	TOTAL	Significance
Rehabilitation of TD2 area	**Loss of employment and enterprise development opportunities due to closure of EPL TD2** During decommissioning and closure, all mining activities will cease and therefore employment opportunities will be limited. It is anticipated that there will be a negative effect on employees as a result of job losses.	2	4	2	1	1	2	20	L	Low	Positive	• Develop a clear and concise employment policy prioritising local employment • Employ local works of qualified applicants with the appropriate skills are available. • Purchase goods and services at a local level if available	4	4	2	1	1	3	36	L

12 Summary of specialist reports

Refer to Table 37 for recommendations made by specialists relating to the proposed re-mining of EPL TD2.

Table 37: Recommendations made by specialists – EPL TD2 re-mining project

List of studies undertaken	Recommendations of specialist reports	Specialist recommendations that have been included in the report	Reference to applicable section where recommendations have been included
Soils (The Biodiversity Company)	There is no segregation of active crop fields or land with a high land potential and capability identified within the proposed area. It is the specialist's opinion that the proposed project will have limited impacts such as soil erosion losses, loss of potential land capability, spillages and soil compaction, on the agricultural production ability of the land, and the proposed project may be favourably considered as have been planned.	N/A	N/A
Terrestrial Biodiversity (The Biodiversity Company)	It is the opinion of the specialists that the project may be favourably considered, provided that the mitigation measures presented in this report be implemented. The location and size of the ecosystem means that it is unlikely that any functional habitat or SCCs will be lost as a result of the impacts arising from the proposed activities.	x	Table 35 Table 36
Wetland (WCS Scientific)	Assuming that the proposed activities are undertaken in an environmentally sensitive manner, and all avoidance, mitigation and rehabilitation measures detailed in the wetland report can be, and are, fully applied during the project implementation, indirect disturbance of wetland habitat can be limited to acceptable levels. As such the proposed project activities should be considered for authorisation.	x	Table 35
Groundwater (Geostratum)	• Housekeeping and regular inspections of the infrastructure should be carried out. • It is recommended that monitoring as per the existing WULA recommendation and to serve as baseline water quality results before the remediation of the Tailings Dan and to act as an early warning detection system of potential contamination originating from the facility.	x	Table 36
Air Quality uMoya-NILU Consulting (uMoya)	It is a reasonable opinion that the proposed project should be authorised considering the outcomes of this impact assessment. It is also recommended that the current and proposed	x	Table 35 Table 36

	dust mitigation measures for the construction, operation and decommissioning phases are implemented to limit negative impacts.		
Noise (dBAcoustics)	• Equipment and/or machinery which radiate noise levels above 85.0dBA to be acoustically screened off. • Noise monitoring at the residential areas and the mine boundaries to be done when complaints area received. • Actively manage the process and the noise management plan must be used to ensure compliance to the noise regulations and/or standards. The levels to be evaluated in terms of the baseline noise levels. • Reverse signal on the vehicles to be replaced with a vibration type signal. • Speed limit within the Tailings Dam footprint to be adhered to at all times.	x	Table 35 Table 36
Heritage Beyond Heritage	The project area is completely transformed through the establishment of the existing tailings dam, and the study area is considered to be of low heritage potential. This was confirmed during the site visit, and no evidence of heritage resources was noted. According to the SAHRA paleontological map, the palaeontological sensitivity is determined as insignificant sensitivity and no further studies are required for this aspect. An application for exemption from a Phase 1 Heritage Impact is therefore supported for the project due to the lack of heritage resources and the extent of the transformation of the area.	N/A	N/A

13 Environmental impact statement

13.1 Summary of the key findings of the environmental impact assessment

A summary of the assessment of potential environmental impacts associated with the proposed project is provided in Table 38. The mitigated assessment assumes that technical design controls, as included in the project description, together with mitigation measures included would be implemented when the proposed project is constructed and operated. Most impacts identified had a significance rating of Medium or Low without implementing mitigation measures, and could be reduced to a Low significance rating after implementing the proposed mitigation measures.

Table 38: Summary of significance of the potential impacts of the proposed project

Potential Impacts	Without mitigation	With mitigation	+/-
Impacts during the Operational Phase			
Degradation of habitats and ecosystems	L	L	-

Potential Impacts	Without mitigation	With mitigation	+/-
Spread of alien and/or invasive species	L	L	-
Water quality deterioration	L	L	-
Impacts on groundwater quality	L	L	-
General rise in ambient noise levels	M	L	-
Increase in dust fallout	L	L	-
Increase in respirable particulates	L	L	-
Benefits resulting from employment and income opportunities created by the re-mining of EPL TD2	L	L	+
Impacts during the Decommissioning and Closure Phase			
Spread of alien and/or invasive species	L	L	-
Improvement of groundwater quality	L	M	+
Decrease of groundwater levels to ambient groundwater level	L	M	+
Increase in ambient TSP, PM_{10} and $PM_{2.5}$ concentrations	L	L	-
Impact on ambient noise levels	M	L	-
Loss of employment and enterprise development opportunities due to closure of EPL TD2	L	L	-

13.2 Final site map

Refer to Figure 3.

14 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

The purpose of the EMP is to provide relevant management measures to conduct activities with due care and diligence, as well as avoid/ limit any adverse impacts of the mining operation. The EMP is compiled to help control impacts that may occur to meet acceptable standards, both as a legal and social responsibility to the environment within which the activities take place.

The objective of the EMP is to create management structures that address the comments of stakeholders with regards to the development, establishes a method of monitoring and auditing environmental management practices during all phases of the activity and ensures that safety recommendations are complied with. Additionally, the EMP provides a method to ensure performance and compliance with all the relevant regulatory authority provisions and guidelines while monitoring of the commitments allows for continual feedback and opportunities to improve.

15 Aspects for inclusion as conditions of authorisation

The following aspects should be included as conditions of the environmental authorisation.

Sibanye-Stillwater must (in terms of the proposed re-mining of EPL2):

- Implement all aspects of the EMPr of this report;
- Undertake annual internal auditing of environmental performance and provide a copy to the DMRE;

- Undertake biennial (once every two years) external auditing of environmental performance and provide a copy of the audit report to the DMRE;

16 Description of any assumptions, uncertainties and gaps in knowledge

In terms of Section 3(p) of Appendix 3 to the EIA Regulations GN 982 (as amended), the EAP must provide a description of any assumptions, uncertainties and gaps in knowledge upon which the impact assessment has been based. Table 39 provides the assumptions and limitations applicable to the various specialist assessments.

Table 39: Assumptions and limitations relating to the proposed re-mining of EPL TD2 project

Specialist	Assumptions and limitation
General	• It is assumed that AVDE has been provided with all relevant project information and that it was correct and valid at the time it was provided. • There will be no significant changes to the project description or surrounding environment between the completion of the Basic Assessment environmental authorisation process and implementation of the proposed project that could substantially influence findings and recommendations with respect to mitigation and management. • The assessment of the mitigated scenario assumes that the design controls and recommended mitigation would be implemented adequately.
Soils	• The handheld GPS used potentially could have inaccuracies up to 5 m. Any and all delineations therefore could be inaccurate within 5 m; and • No heavy metals have been assessed nor fertility been analysed for the relevant classified soils.
Terrestrial biodiversity	• It is assumed that all information received from the client and landowner is accurate; • All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes; • The assessment area (project area) was based on the area as provided by the client, and any alterations to the area and/or missing GIS information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment; • The project description was based on information provided by the client, and any alterations to the area and/or missing data pertaining to the development would have affected the area surveyed and hence the results of this assessment; • The area was surveyed during a single site visit and therefore this assessment does not consider temporal trends (note that the data collected is considered sufficient to derive a meaningful baseline); • The single site visit was conducted during the dry season, and this means that certain flora would not have been present or observable due to seasonal however most species have likely been recorded; • Whilst every effort was made to cover as much of the project area as possible, representative sampling is completed, and by its nature it is possible that some plant species that are present within the project area were not recorded during the field investigations; and • The GPS used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by up to 5 m.
Wetland	• The current extent of wetland habitat on site was mapped and used as input data for the PES assessment, and not the historical or original extent. This is relevant to wetland systems that have for example been affected by mining and

Specialist	Assumptions and limitation
	where wetland habitat has been permanently lost to mining or associated infrastructures. Although the mining impact occurred within wetland habitat, given that the PES assessment was undertaken using the current extent of wetland habitat, the mining impact will be assessed as occurring within the wetland buffer rather than within the actual wetland. This may result in overestimating the health and PES of the wetland. • Wetland systems have been mapped and typed based on their current characteristics. A number of wetland systems receive significant water inputs from artificial sources (e.g., discharges or seepage from Tailings Storage Facilities) and it is uncertain whether or not these systems would have supported wetland habitat under natural (pre-disturbance) conditions, or alternatively would have been rivers or drainage lines. As no historical aerial imagery of these systems pre-dating mining disturbances was available during this study, it is not possible to state without some uncertainty as to whether or not these systems would naturally have been classed as wetlands. The PES assessment methodology was also applied to these wetlands. • The PES assessment methodology is based on landcover/disturbance units within the wetland, its buffer, and its catchment. Impacts to wetlands that are not associated with a specific landcover class, such as point source discharges of water (e.g., from Waste Water Treatment Works) or flow reduction due to groundwater drawdown, are typically underestimated or excluded from the Level 1A and B assessments. In such cases the PES scores were manually downgraded based on specialist observation and opinion. • The Level 1A assessment is limited to 19 pre-defined landcover classes. All landcover units mapped had to be allocated to these pre-defined landcover classes. • The impact intensity scores ascribed to the various landcover classes were used in the assessment as captured in the Level 1A assessment spreadsheets and not changed. • For landcover within the catchments of wetlands, use was made of the National Landcover 2020 dataset. As this data is already several years old, some changes in landcover may have taken place on site which are not reflected in this assessment. This has been partially addressed through targeted updating of landuse, but some inaccuracies are unavoidable. • It is also noted that the National Landcover dataset overestimates the extent of natural vegetation on site, with, for example, extensive areas of degraded or historically transformed areas still classed as natural, rather than semi-natural; this results in elevating the PES scores. To correct against this misrepresentation, all areas marked as “natural grassland”, “open woodland” and “contiguous (indigenous) forest” were considered as semi-natural in the PES assessment. This was supported by observations from the terrestrial ecologist forming part of the Sensitive Landscapes Project team, which revealed very limited remaining primary (natural) vegetation on site (Duncan McKenzie, pers. comm.). Areas that remained classified as “Natural” were limited to the Magaliesberg range, where disturbance is assumed to be more limited, and areas highlighted by the terrestrial ecologist as being representative of natural habitat, i.e.: Norite koppies, hills and ridges (D. McKenzie, pers. comm.).
Groundwater	• The Hydrogeological Impact Assessment, was carried out from a desktop perspective, existing monitoring data from the mine together with the existing Hydrogeological reports and model for the mine was incorporated within the desktop review and risk assessment, even though the data was reviewed in order to confirm the reliability of the data , Geostratum cannot be held liability for any discrepancies or consequences based on the decision making in the report and for the actual data provided by the client.

Specialist	Assumptions and limitation
Air Quality	• It is assumed that the available air quality monitoring data adequately describe the baseline condition of the general area. • It is assumed that the project information is representative resulting in estimated emissions that are representative. • The Air Pollution Model (TAPM) model is used to generate a 3-dimensional hourly-resolved meteorological input file for the modelling domain. It is assumed that estimated emissions are representative of the mining and the mining activities.

17 Reasoned opinion as to whether the proposed activity should or should not be authorised

17.1 Reasons why the activity should be authorised or not

No fatal flaws in the project have been identified thus far through the basic assessment process. However, several environmental and social impacts are envisaged during the operational and decommissioning and closure phases, which require careful mitigation and monitoring. It is the opinion of the EAP that all major impacts have been identified and have been assigned appropriate management measures. Negative High impacts with mitigation, are reduced to LOW significance, and can be managed accordingly.

It is recommended by the EAP that the proposed re-mining of the EPL TD2 is allowed to proceed, on the assumption that the environmental and social management commitments included in this EMPr are adhered to, the project description remains as per the description provided in this document and considering the positive social impacts associated with the project.

17.2 Conditions that must be included in the authorisation

Refer to Part A Section 15.

18 Period for which the Environmental Authorisation is required

The life of mine for the re-mining of EPL TD2 is approximately 15 years. Therefore, period for which environmental authorisation is required for the proposed re-mining of EPL TD2 is at least 15 years.

19 Undertaking

The undertaking by the EAP is provided in Part B Section 11.

20 Financial Provision

The unscheduled closure cost for EPL TD2 calculated in 2022 is R 34 460 635.62 (excluding VAT).

20.1 Explain how the aforesaid amount was derived

Refer to Appendix E.

20.2 Confirm that this amount can be provided for from operating expenditure

The closure liability for Marikana Mine is provided in the form of a bank guarantee. A closure liability assessment is conducted annually whereby the bank guarantee is adjusted accordingly.

21 Specific Information Required by the Competent Authority

Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998), the BAR report must include the:

- Impact on the socio-economic conditions of any directly affected person; and
- Impact on any national estate referred to in section 3 (2) of the National Heritage Resources Act (Act 25 of 1999).

The above requirements are addressed in Part A Section 11.8.

22 Other matters required in terms of sections 24(4)(a) and (b) of the Act

No other matters have been identified for inclusion to date.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1 Details of the EAP

Refer to Part A Section 2 for details of the EAP.

2 Description of the aspects of the activity

Refer to Part A Section 5.2 for a description of the aspects of the proposed activity.

3 Composite map

Refer to Figure 3 in Part A.

4 Description of the impact management objectives including management statements

4.1 Determination of closure objectives

Information for this section was obtained from the Final Rehabilitation, Decommissioning and Mine Closure Plan for Marikana Mining Operations as at December 2020 (Golder, 2021).

The closure philosophy and objectives below have been developed to guide the closure measures to be implemented on site towards achieving the above closure vision:

- **Physical stability:** to remove and/or stabilise surface infrastructure, unavoidable mining residue and open pits that are present on the mine to facilitate the implementation of the planned next land use, by ensuring that:
  - Mining-related remnants/features are stable and as such will not pose a safety risk
  - The stability of remaining mining-related remnants/features will display longevity with slow landform evolution when exposed to expected natural forces
  - The stability of remaining mining-related remnants/features will be such that these do not detract from the surrounding next land use
  - If long term stability cannot be ensured, the measures adopted will take account of this and any instability mitigated as far as possible
  - All rehabilitated disturbed areas that have the potential for wind and/or water erosion will be provided with a suitable vegetation cover to combat these aspects/forces
  - Open pits are backfilled so that beneficial land uses can be implemented, and that remaining (unprocessed) WRDs are stabilised to limit possible safety, health and/or environmental risks; and
  - Monitoring is undertaken to demonstrate the success of the closure and rehabilitation measures implemented.
- **Environmental quality:** to ensure that local environmental quality is not adversely affected by possible physical impacts and chemical contamination arising from the rehabilitated areas and that catchment yield is sustained as far as possible after closure, by ensuring that:
  - Rehabilitated mining areas do not present any unacceptable environmental risks
  - Long term catchment yield and water quality is sustained, especially given the arid climate in which the mine is located and the dependency of surrounding settlements on the water resources

- Rehabilitated mining areas do not compromise the next land use or the land capability of surrounding areas
- Environmental impacts will be investigated and addressed at source. If not possible, the required intervention/mitigation measures will be implemented, and preferably during operations to limit the intervention required at closure; and
- Ongoing monitoring will be undertaken to ensure the quality of the groundwater, specifically in terms of copper contamination and salts, remains within acceptable threshold levels.

- **Health and safety:** to limit the possible health and safety threats to humans and animals using the rehabilitated mine site as it becomes available, by ensuring that:
  - Health and safety threats are prevented as far as possible. If not, to limit these to acceptable risks that can be reasonably/realistically achieved.
- **Land capability/land-use:** to re-instate suitable land capabilities over the rehabilitated portions of the mine site, by ensuring that:
  - Where possible land capability will be reinstated matching that of the surrounding undisturbed areas as far as possible. If not, effort will be put into achieving the next best land capability. Land capability could be compromised on limited areas over the greater rehabilitated mine site, by meeting the requirements for a healthy, safe and stable post mining landscape
  - A functional post-mining landscape is achieved that enables self-sustaining agricultural practices where possible; and
  - Invasive vegetation species will be combated to assist towards the desired land capability and functioning of riparian zones.
- **Aesthetic quality:** to leave behind a rehabilitated mine site that, in general, is not only neat and tidy with an acceptable overall aesthetic appearance, but which, in terms of this attribute, is also aligned to the respective land uses, by ensuring that:
  - Recognition will be given to the local/natural analogues and these be repeated as far as practically possible
  - Protruding residual/remaining mining-related remnants/features are blended in as far as possible into the local natural back drop
  - Rehabilitation measures that appear unnatural/visually intrusive will be avoided as far as possible; and
  - Establishment of indigenous vegetation will be planned as far as possible for rehabilitation.
- **Biodiversity:** to encourage, where appropriate (for example in riparian corridors), the re-establishment of native vegetation on the rehabilitated mine sites such that the terrestrial biodiversity is largely re-instated over time, by ensuring that:
  - The establishment of viable self-sustaining vegetation communities and habitat niches over rehabilitated areas, that will encourage/facilitate the re-introduction of local vegetation communities/assemblages; and
  - Invasive species that could threaten the reinstatement of the desired vegetation communities are actively combatted.
- **Social:** to ensure that the infrastructure transfers, and measures and/or contributions made by the mine towards the long-term socio-economic benefit of the local communities are sustainable, and aligned to the detailed socio-economic mine closure plan, by ensuring that:
  - Local communities are empowered/informed on mine closure
  - Obsolete/dormant mine infrastructure that could be beneficially reused is identified
  - Receiving communities are empowered to take over and maintain ceded infrastructure for their ongoing benefit, i.e. boreholes to remain at closure for local communities; and
  - The mine site is protected from inadvertent access.

4.2 Has a water use licence been applied for?

The Marikana Operations has an existing Water Use Licence (WUL) that comprises water uses at both WPL and EPL. Licence Number 01/A21K/ABCEFGIHJ/4620, issued on 22 February 2019. The EPL TD2 is authorised as Section 21 (g) water use (disposing of waste in a manner which may detrimentally impact on a water resource) in terms of the National Water Act (Act No. 36 of 1998). The description of the activity includes disposal of tailings onto the EPL Tailings Dam 2 for disposal (storage), re-use or retreatment.

The wetland assessment confirmed that a depression wetland is located within 500m of EPL TD2. A GN509 risk assessment was undertaken for the project and resulted in a "Low" risk rating for the activities proposed. Therefore, a General Authorisation application in terms of the NWA will be required.

A General Authorisation application will be lodged with the DWS through the e-WULAAS system.

5 Impacts to be mitigated in their respective phases

Refer to the full impact assessment and mitigations tables provided in Table 35 and Table 36.

6 Financial provision

The closure liability for Marikana Mine is provided in the form of a bank guarantee. A closure liability assessment is conducted annually whereby the bank guarantee is adjusted accordingly.

The unscheduled closure cost for EPL TD2 calculated in 2022 is R 34 460 635.62 (excluding VAT).

7 Mechanisms for monitoring compliance

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

- Monitoring of impact management actions;
- Monitoring and reporting frequency;
- Responsible persons;
- Time period for implementing impact management actions; and
- Mechanism for monitoring compliance.

Table 40: EPL TD2 mechanisms for monitoring compliance

Monitoring requirements	Description of monitoring requirements	Roles and Responsibility	Frequency
Environmental authorisation and EMPr performance assessment	Auditing of environmental authorisation, environmental management programme and closure plan must be done in accordance with the Regulation 34 and Appendix 7 of the EIA Regulations (2014) under the NEMA (1998).	Environmental Department	Internal audit, annually External audit, biennially (once every two years)
Water quantity & quality monitoring	Monitoring of surface and ground water resources will take place according to the WUL. The mine's water quality monitoring is conducted by an external consultant.	Environmental Department	As per the WUL
Dustfall monitoring	Dustfall monitoring is conducted monthly.	Environmental Department	Monthly as per the air quality monitoring programme
Biodiversity Monitoring	Biodiversity monitoring will be undertaken according to the biomonitoring protocol. Biodiversity monitoring will be undertaken jointly by the mine and external consultants	Environmental Department	Annually

8 Indicate the frequency of the submission of the performance assessment

Unless otherwise instructed by the Competent Authority (DMRE) or as a condition to the environmental authorisation, internal environmental compliance audits on the EMPr will be undertaken annually, and the resultant audit reports will be submitted to the DMRE. External environmental compliance audits on the EMPr will be undertaken biennialy (once every two years) by an independent EAP, and a copy of the external audit report will be submitted to the DMRE.

The auditing process, as well as report format will comply with the requirements as contained in the EIA Regulations, GN R982, dated December 2014, as amended.

9 Environmental Awareness Plan

Information for this section was obtained from Eastern Platinum Mine Final Environmental Impact Assessment and Environmental Management Programme (SEF, 2012).

Sibanye-Stillwater is committed to identifying training needs and ensuring that all personnel whose work may create a significant impact upon the environment receive appropriate training. The Environmental Awareness Plan describes the training available and the manner in which environmental training needs are identified and continually reassessed. With all Business Units being ISO14001 certified, environmental awareness training as well as competency training is required.

9.1.1 Objectives

The objectives of the Environmental Awareness Plan are to ensure that:

- Training needs are identified and all personnel whose work may create a significant impact upon the environment have received appropriate training.
- Procedures are established and maintained to make employees aware of:
  - The importance of conformance with Sibanye-Stillwater's environmental standards and procedures and the requirements of the Environmental Management Systems (EMS);
  - The significant environmental impacts, actual or potential, of their work activities and environmental benefits of improved personal performance;
  - Their roles and responsibilities in achieving conformance with environmental policy and procedures; and
  - The potential consequences of departure from specified operating procedures.
- Personnel performing tasks, which can cause significant environmental impacts, are competent in terms of appropriate education, training and/ or experience.

9.1.2 Responsibilities

he responsibilities in terms of environmental awareness training lies with Sibanye-Stillwater Environmental Centre, Individual Business Units and the Sibanye-Stillwater Academy as described in Table 41 below:

Table 41: Environmental awareness training responsibilities

Sibanye-Stillwater Environmental Centre	Sibanye-Stillwater Academy	Individual Business Units
Guidance on training needs analysis and materials	General environmental awareness training	General environmental awareness

Sibanye-Stillwater Environmental Centre	Sibanye-Stillwater Academy	Individual Business Units
		training Formal and informal). Requirement of the ISO 14001 standard
Assist with specialised training	Components of specialised environmental training	Training needs analysis
Contract specialists for specialist environmental legal training	Maintain Training records	Training needs analysis
		Maintain training records

9.1.3 Identification of training needs

he identification of environmental training and development needs is derived from the analysis of role descriptions. The role description is used to confirm the category of occupation as per EPL structure templates. Descriptions of activities, aspects and impacts are sourced from the EMS database. The EMS database provides descriptions of environmental aspects and impacts per section/department. Derived from this information, a training and development needs matrix was compiled displaying the EMS responsibility/role, required knowledge and outputs, intervention required and interval of intervention.

The following general and specific training needs have been identified at EPL:

- General training
  - Environmental awareness training;
  - Awareness of the Sibanye-Stillwater Safety and Sustainability policy;
  - Awareness of environmental legislation; and
  - Related Sibanye-Stillwater environmental requirements.
- Specific training
  - Awareness of significant environmental aspects associated with work activities;
  - Awareness of environmentally related operational procedures applicable to work activities;
  - Awareness of the potential consequences of not following environmentally related operational procedures; and
  - Environmental legislative requirements of work activities.

9.1.4 Available training

Training across Sibanye-Stillwater generally takes the form of general environmental awareness, environmental talk topics, task specific environmental training, training regarding software and specific aspects of the ISO 14 001 environmental management systems and training on legislative requirements.

- General environmental awareness is undertaken as part of induction on an annual basis, including all contractors who work at Sibanye-Stillwater for longer than one week on site. Induction training includes the Safety and Sustainability policy, standards, charters and visions as well as an introduction to ISO 14001. There is an emphasis on the description of environmental impacts, namely air pollution, waste management, water management, land management and energy conservation, the importance of environmental legislation, key roles and responsibilities in terms of environmental management and the reporting of non-conformances.
- Task specific Safety and Sustainability training has been developed for the operational areas based on the significant environmental aspects/impacts. The training program includes on the job training with applicable personnel and encompasses the following training topics:
  - Waste prevention and control;
  - Waste sorting and handling;

- Resource consumption;
- Storing and handling of petroleum hydrocarbons;
- Storing and handling of chemicals;
- Rehabilitation/housekeeping; and
- Spills prevention/clean up.

- Legal training provides senior, middle and key environmental management personnel with information on environmental legal requirements. Consultants or environmental advocates may present and conduct this training.
- ISO 14001 training entails training on all software utilised in the system and training required to successfully undertake internal and external audits.

9.1.5 Review of training material

Relevant Business units will and update the training needs analysis and the training material on an annual basis as a minimum frequency as part of the ISO 14001 requirements. Sibanye-Stillwater Environmental Centre will provide an assistance and review role as and when required. The information utilised for the annual reassessment of environmental training needs and material includes:

- Updated aspect registers;
- Updated environmental management programs;
- Updated lists of procedures (EMS and operational);
- Feedback from audits (internally and externally);
- Feedback on trends in environmental non-conformance and incidents; and
- Feedback from Safety and Sustainability and Zero Tolerance inspections.

10 Specific Information required by the competent authority

No additional information has been requested by the competent authority to date.

11 Undertaking

The EAP herewith confirms:

a) The correctness of the information provided in the reports;
b) The inclusion of comments and inputs from stakeholders and I&APs;
c) The inclusion of inputs and recommendations from the specialist report where relevant; and
d) That the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein

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Signature of the EAP

Name of Company: Alta van Dyk Environmental Consultants cc

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Date

12 References

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Water Hunters, 2023. Marikana Operations: Implementation of a Numerical Groundwater Flow Model. Reference Number WH01-2020_9. August 2020.

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Appendices

Appendix A: Curriculum Vitae of EAP

Appendix B: Public Participation Documentation

Appendix B1: List of stakeholders

Appendix B2: Minutes of pre-application meetings

Appendix B3: Proof of site notices

Appendix B4: Background Information Letter

Appendix B5: Proof of distribution of BIL

Appendix B6: Proof of Advertisement

Appendix B7: Notification letter

Appendix B8: Proof of distribution of notification letter

Appendix B9: SMS notification

Appendix B10: Comments received

Appendix C: Specialist Reports

Appendix C1: Air Quality Study

Appendix C2: Agricultural Compliance Statement

Appendix C3: Terrestrial Vegetation Compliance Statement

Appendix C4: Wetland Assessment

Appendix C5: Groundwater Study

Appendix C6: Noise Assessment

Appendix C7: Heritage

Appendix D: Screening Tool Report

Appendix E: Unscheduled Closure Cost for EPL TD2 (2022)