

ALTA VAN DYK ENVIRONMENTAL CONSULTANTS (PTY) LTD

Project Reference Number: 1074427



SIBANYE RUSTENBURG PLATINUM MINES (PTY) Ltd

**FINAL BASIC ASSESSMENT REPORT:
PROPOSED AMENDMENT OF MINING
RIGHT NW 80 MR AND THE EXPANSION
OF THE KWEZI MINING OPERATIONS
THROUGH THE INCLUSION OF THE UG
SHALLOWS BLOCKS (A&B)**

January 2025

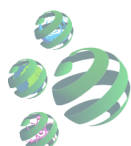
**ALTA VAN DYK ENVIRONMENTAL
CORPORATE GROUP**

+27 (0)11 940 9457

reata@avde.co.za

www.altavandykenvironmental.co.za

**Alta van Dyk
Environmental**



**Alta van Dyk
Corporate Group**

PROJECT DETAILS

CLIENT NAME: SIBANYE RUSTENBURG PLATINUM MINES (PTY) LTD

PROJECT NAME: EXPANSION OF THE KWEZI MINING OPERATIONS THROUGH THE INCLUSION OF THE UG SHALLOWS BLOCKS

REPORT DETAIL: PROPOSED AMENDMENT OF MINING RIGHT NW 80 MR AND THE EXPANSION OF THE KWEZI MINING OPERATIONS THROUGH THE INCLUSION OF THE UG SHALLOWS BLOCKS (A&B)

**ALTA VAN DYK
CORPORATE GROUP
SUBSIDIARY**

ALTA VAN DYK ENVIRONMENTAL CONSULTANTS (PTY) LTD



REPORT DATE: JANUARY 2025

VERSION CONTROL: VERSION 1

MAIN AUTHOR: KIRTHI PERAMAUL

MANAGING DIRECTOR: REATA COLYN

TECHNICAL DIRECTOR: ALTA VAN DYK

The opinions expressed in this Report have been based on the information supplied to Alta van Dyk Environmental (Pty) Ltd ("AvDE"), a subsidiary of Alta van Dyk Corporate Group ("AvDCG"), by company officials. The opinions in this Report are provided in response to a specific request from company officials to do so. AvDCG has exercised all due care in reviewing the supplied information. Whilst AvDCG has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. AvDCG does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of AvDCG's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which AvDCG had no prior knowledge nor had the opportunity to evaluate.

APPROVED BY: ALTA VAN DYK / REATA COLYN

SIGNATURE:





FINAL 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:	Sibanye Rustenburg Platinum Mines (Pty) Ltd
PROJECT:	Proposed Amendment of Mining Right NW 80 MR and the Expansion of the Kwezi Mining Operations through the Inclusion of the UG Shallows Blocks (A&B)
CONTACT PERSON:	Philip Ramphisa
TEL NO.:	014 495 1010
POSTAL ADDRESS:	Private Bag X508, Marikana 0284
PHYSICAL ADDRESS	Hex River Complex, Old Mine Road, Rustenburg 0299
DMRE REFERENCE NO.:	NW30/5/1/1/2/80 MR
SECTION 102 DMRE REFERENCE:	NW-00383-MR/102

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 (“EIA”) and an Environmental Management Programme report (“EMPr”) 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 (“EA”) being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner (“EAP”) 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

CONTENT

Project Details	..ii
Content	..v
Comments on the Final Basic Assessment Report	..xii
Comments on the Draft Basic Assessment Report	..xiii
Executive Summary	..xiv
Declaration of the Environmental Assessment Practitioner	..xvi
Abbreviations	..xvii
1. Introduction and Background	1
1.1 Background	1
1.2 Purpose of the report	2
1.3 Content of the Final Basic Assessment Report	2
1.4 Structure of the report	1
1.5 Applicant Details	1
1.5.1 Pulling and Sharing Agreement	1
1.5.2 Mining Right	1
1.6 Details of the EAP	2
1.6.1 Summary of EAP Experience	2
1.7 Locality	3
1.8 Site Sensitivity Verification	7
1.9 Assumptions and Limitations	9
2. Project Description	12
2.1 Description of Existing Activities at the Kwezi Shaft	12
2.1.1 Mining	12
2.2 Description of Proposed Activities to be Undertaken	16
2.2.1 Proposed Expansion (UG Shallows Blocks A and B)	16
2.2.2 Surface Description (Blocks A and B)	17
2.2.3 Mining	18
2.2.4 Backfilling	18
3. Legal Framework	22
3.1 The Constitution of the Republic of South Africa (Act 108 of 1996)	22
3.2 The Minerals and Petroleum Resources Development Act (Act 28 of 2002) (“MPRDA”) as amended on 21 April 2009	22

3.2.1	Application for a Mining Right	22
3.2.2	Amendment of rights, permits, programmes and plans	23
3.3	National Environmental Management Act (Act 107 of 1998) ("NEMA")	23
3.3.1	Application for Environmental Authorisation	24
3.4	National Environmental Management: Waste Act (Act 59 of 2008) ("NEM:WA")	25
3.5	National Water Act (Act 36 of 1998) ("NWA")	26
3.5.1	Approved Water Use License.....	27
3.5.2	Application for a Water Use Licence	27
3.5.3	Regulations on the use of water for Mining and related activities aimed at the protection of water resources - GN704 dated 4 June 1999.....	28
3.6	National Environmental Management: Biodiversity Act (Act 10 of 2004) ("NEM:BA").....	29
3.7	National Heritage Resources Act (Act 25 of 1999) ("NHRA").....	29
3.8	Other Applicable Legislation	30
4.	Need and Desirability of the Project	32
4.1	Project Need.....	32
4.2	Project Desirability	32
4.2.1	National.....	32
4.2.2	Provincial	32
4.2.3	Local	32
5.	Project Alternatives	35
5.1	Operational Aspect.....	36
5.2	No-go Alternative	36
6.	Public Participation Process.....	38
6.1	Legal requirements for public participation	39
7.	Environmental Status Quo (Baseline)	44
7.1	Topography	44
7.2	Climatology	44
7.2.1	Temperature.....	44
7.2.2	Precipitation	44
7.2.3	Wind Direction.....	45
7.3	Geology	46
7.4	Biodiversity.....	49
7.4.1	Vegetation	49
7.4.2	North West Biodiversity Sector Plan.....	49
7.4.3	Flora.....	52

7.4.1	Fauna.....	52
7.5	Soils and Land Use.....	53
7.6	Surface Water.....	53
7.7	Wetland.....	55
7.7.1	Freshwater Ecosystem Characterisation	55
7.7.2	Anthropogenically derived artificial features	55
7.7.3	Freshwater Ecosystem Classification.....	56
7.7.4	Site verification results	57
7.8	Hydropedology.....	58
7.8.1	Site conditions.....	58
7.8.2	Hydropedological considerations	58
7.8.3	Scientific buffer determination	60
7.9	Groundwater	61
7.9.1	Weathered Aquifer	61
7.9.2	Primary Alluvial Aquifer	62
7.9.3	Secondary Fractured Aquifer	62
7.9.4	Hydro Census and Borehole Data	62
7.9.5	Aquifer Boundaries.....	66
7.9.6	Groundwater gradients and flow	66
7.10	Air Quality	71
7.11	Noise.....	71
7.12	Archaeology and Cultural Heritage	71
7.13	Palaeontology	72
7.14	Visual.....	72
7.15	Socio-Economic	73
8.	Environmental Impact Assessment	75
8.1	Methodology to be used.....	75
8.2	Cumulative Impact	77
8.3	Impacts and risks associated with the proposed project	77
8.3.1	Wetlands	77
8.3.2	Hydropedology.....	77
8.3.3	Heritage	78
8.3.4	Blasting and vibration	78
8.3.5	Stability Assessment	81
8.3.6	Groundwater	85
8.3.7	Socio -economic	101

9.	Environmental Management Programme	111
9.1	Objective of the Environmental Management Programme Report.....	111
9.2	Implementation of the EMPr	111
10.	Monitoring and Reporting	119
10.1	Environmental Awareness Training	119
10.2	Performance Assessment and Reporting	119
10.3	Record Keeping	120
10.4	Incident Reporting	120
10.5	Emergency Procedures	120
10.6	Environmental Monitoring.....	121
10.6.1	Groundwater Monitoring	121
10.6.2	Blast and Vibration Monitoring.....	124
10.7	Environmental Management and Monitoring Plan.....	124
11.	Closure and FINANCIAL PROVISION	127
11.1	Key Closure Objectives	127
11.2	Financial Provision.....	127
12.	Conclusion and Recommendations.....	129
12.1	Professional Opinion of the EAP and Impact Statement	129
12.2	Period which Environmental Authorisation is required	130
	References	131
	Appendix A: CV of the EAP	132
	Appendix B: DFFE Screening Reports.....	133
	Appendix C: Specialist Studies	134
	Appendix C1: Heritage Impact Assessment	135
	Appendix C2: Wetland Assessment	136
	Appendix C3: Hydropedological Assessment	137
	Appendix C4: Groundwater Assessment	138
	Appendix C5: Blast and Stability Assessment.....	139
	Appendix D: Public Participation	140
	Appendix D1: Stakeholder Database	141
	Appendix D2: Pre-Application Meeting with the DMRE	142
	Appendix D3: Site Notices	143

Appendix D4: Background Information Document	144
Appendix D5: Proof OF Notification.....	145
Appendix D6: Knock And Drop Register.....	146
Appendix D7: Notification Letter	147
Appendix D8: Registered Mail	148
Appendix D9: Focus Group Meeting- SAB	149
Appendix D10: Focus Group Meeting- Stakeholders	150
Appendix D11: Comments AND Response report	151
Appendix D12: Comments Received	152
Appendix D13: Newspaper Avert	153
APPENDIX D14: MINUTES OF FOCUS GROUP MEETINGS (DBAR PHASE)	154
APPENDIX D15 RESPONSES PROVIDED	155
APPENDIX D16 COMMENTARY AUTHORITY COMMENTS	156
APPENDIX D17 DBAR NOTIFICATION	157
Appendix E: Financial Provision Motivation	158
Appendix F: GN704 Motivation	159
Appendix G: ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN.....	160

List of Figures

Figure 1: Google Earth Image Showing the 80MR Mining RiGHT Area	1
Figure 2: Locality Map.....	4
Figure 3 Property Map 1d	6
Figure 4: Location of the kwezi shaft	14
Figure 5: kwezi shaft layout	15
Figure 6: ILLUSTRATION OF BLOCK A & B IN RELATION TO THE MINING RIGHT (80MR) (SOURCE: GOOGLE Earth	16
Figure 7: Illustration on 80 MR and location of UG2 Shallows blocks A & B	17
Figure 8: Google Earth Image of block a (annotated in red)	17
Figure 9: GOOGLE EARTH IMAGE OF BLOCK B (ANNOTATED IN green)	18
Figure 10: Underground working plan showing old Kwezi workings and proposed UG2 Shallowing workings. Scalping tonnes are packed in designated excavations in old areas	19
Figure 11: UG2 Shallows blast design to generate waste lumps greater than 34mm	19
Figure 12 Topography of site area (topographic-map, 2024).....	44
Figure 13 Average tempreature and Precipitation for Rustenburg Area (Metaobblue, 2024).....	45
Figure 14 Annual wind Rose for Rustenburg Area (Metaobblue, 2024)	45
Figure 15 regional surface geology.....	47
Figure 16: Generalised Stratigraphic Column of the Rustenburg Layered Suite of the Bushveld Complex (Viljoen & Schurmann, 1998) (MvB Consulting, 2024).....	48
Figure 17: Vegetation Map of the Study Area	49
Figure 18 North-West Biodiversity Sector Plan of the site area	51
Figure 19 Subcatchments in the Hex River A22h Catchment (Aquatico)	54
Figure 20 Representative photographs of the artificial feature (top) which drain into the north eastern CVB wetland (bottom). The artificial feature has been channelised by means of concrete embankments (SAS, 2024)	56
Figure 21: Map depicting the delineated CVB wetland and artificial features associated with the study and investigation areas (SAS, 2024).....	57

Figure 22: Hydropedological soil groups associated with the soil forms identified within the project area (Zimpane, 2024)	60
Figure 23: Map depicting the recommended scientific buffer (Zimpane, 2024)	61
Figure 24: Hydrocensus Boreholes (MvB Consulting, 2024)	63
Figure 25: Relationship between topography and groundwater table	69
Figure 26: Regional groundwater gradients and aquifer boundaries	70
Figure 27: Paleontological sensitivity of the approximate study area (yellow polygon) as indicated on the SAHRA Palaeontological sensitivity map	72
Figure 28: PPV for a single 38mm blasthole as a function of distance and face advance (OHMS, 2024)	79
Figure 29: Depth classes for the planned mining area (OHMS, 2024)	80
Figure 30: Areas <35.0mbs in the proposed mining area (OHMS, 2024)	80
Figure 31: Relation between pillar stress level and extraction ratio	81
Figure 32: Design layout pillar factor and safety	82
Figure 33: Classified factors of safety for the areas under consideration	82
Figure 34: Calculated stress concentration factor for each pillar	83
Figure 35: Categorized risk classification for each individual pillar	83
Figure 36: Maximum Vertical displacement at the underground stopes	84
Figure 37: Maximum Vertical displacement at the surface above the stoping area	85
Figure 38: Monitoring and hydrocensus locality	90
Figure 39: Piper diagram for the Srpm aquifer monitoring boreholes	94
Figure 40: 3-Dimensional mined outmodel	94
Figure 41: Underground mining extent	96
Figure 42: Estimated groundwater inflow volume – Block A	98
Figure 43: Estimated groundwater inflow volume- Block A	98
Figure 44: Simulated groundwater level drawdown within the kwezi mining extension (MvB Consulting)	100
Figure 45: Simulated groundwater level drawdown in borehole bh6	101
Figure 46: Location of Kwezi Shaft Groundwater Monitoring Points	122
Figure 47: Recommended monitoring boreholes	123
Figure 48: Ground monitoring points	124

List of Tables

Table 1: Requirements of the FINAL Basic Assessment Report	3
Table 2: Applicant details	1
Table 3: Details of the EAP	2
Table 4: Description of the Property	3
Table 5: LANDOWNERS applicable to the proposed project	5
Table 6: Environmental Sensitivity of the Project Area (DFFE Screening Tool) Block A and B	7
Table 7: ENVIRONMENTAL SENSITIVITY OF THE PROJECT AREA (DFFE SCREENING TOOL) South East of Block A & B.	7
Table 8: Specialist Studies Required As Per The Screening Tool Report And Relevant Motivation for Block A and B	7
Table 9: Assumptions and Limitations	9
Table 10: Volume of backfilling waste rock generate during scalping process	19
Table 11: Triggered listed activities for the proposed project (NEMA)	24
Table 12: Triggered activities for the proposed expansion (NEM:WA)	26
Table 13: Triggered activities in terms of the NWA	28
Table 14: GN704 Requirements	28
Table 15: Alternatives aspects considered	35
Table 16: Assessment of alternative waste management strategies for the waste rock	36
Table 17: Public participation process followed	38
Table 18: Legal requirements for Public Participation	39
Table 19: Soil characteristics (Golder, 2020)	53
Table 20: Characterisation at Levels 3 and 4 of the Classification System (Ollis et al., 2013) of the CVB wetland associated with investigation area (SAS, 2024)	55
Table 21: Hydrocensus Information Summary	64
Table 22: Groundwater Levels	66
Table 23: Scale utilised for the evaluation of the Environmental Risk Rating	75
Table 24: Scale used for the evaluation of the Environmental Significance Ratings	77
Table 25: Ground vibrations limites as per USBM	78
Table 26: Pillar System width to height ratios and factor of safety	81

Table 27: Classification of subsidence profiles.....	84
Table 28: Pump Test information (MvB Consulting, 2024).....	86
Table 29: Aquifer Parameters and borehole yield (MvB Consulting, 2024).....	86
Table 30: Groundwater Chemistry in the Kwezi Monitoring boreholes	91
Table 31: Groundwater Chemistry in tested hydrocensus boreholes	92
Table 32: Mining elevations	95
Table 33: Boreholes affected by the lowering of the groundwater table (MvB Consulting, 2024)	99
Table 34: Assessment of identified impacts of the proposed project: Operational Phase	103
Table 35: Assessment of identified impacts of the proposed project: Closure phase	108
Table 36: Environmental Management Programme	112
Table 37: Groundwater components to be monitored	121
Table 38: Current Groundwater Monitoring Points.....	121
Table 39: Water quality parameters for monitoring	122

COMMENTS ON THE FINAL BASIC ASSESSMENT REPORT

This Final Basic Assessment Report was available for public comments for a period of **30 days from the 27 July 2026 to 26 August 2026**. Copies of the Final BAR was available at the following public places:

Public Place	Locality	Physical Address	Contact Details
Rustenburg Public Library	Rustenburg	153 Smit Street	Tel: +27 71 075 1618
Kwezi Operations Security Office	Rustburg		
Alta van Dyk Corporate Group Offices	Olifantsfontein	Unit 2212 9 Mountain Sherman Crescent Midlands Estate	Tel: +27 12 940 9457 Fax: +27 86 634 3967
Website	https://www.altavandykenvironmental.co.za		
Sibanye Stillwater Ulwazi data free app	http://ulwazi.datafree.co/z		

To engage effectively the following methods for public comment and engagement on the Draft BAR were available:

- Written submissions via email, or telephone to the project manager:

Suzanne van Rooy & Reata Colyn

Alta van Dyk Environmental (Pty) Ltd
Postnet Suite #745
Private Bag X1007
Lyttelton
0140

Tel: +27 12 940 9457 / Fax: +27 86 634 3967 / E-mail: suzanne@avde.co.za & reata@avde.co.za

DUE DATE FOR COMMENT ON FINAL BAR IS

26 August 2026

A stakeholder database was and is maintained throughout the process and comments received thus far have been included in this Final Basic Assessment Report.

COMMENTS ON THE DRAFT BASIC ASSESSMENT REPORT

This Draft Basic Assessment Report was available for public comments for a period of **30 days from the 14 November 2024 until 13 December 2024**. Copies of the Draft BAR was available at the following public places:

Public Place	Locality	Physical Address	Contact Details
Rustenburg Public Library	Rustenburg	153 Smit Street	Tel: +27 71 075 1618
Kwezi Operations Security Office	Rustburg		
Alta van Dyk Corporate Group Offices	Olifantsfontein	Unit 2212 9 Mountain Sherman Crescent Midlands Estate	Tel: +27 12 940 9457 Fax: +27 86 634 3967
Website	https://www.altavandykenvironmental.co.za		
Sibanye Stillwater Ulwazi data free app	http://ulwazi.datafree.co/z		

To engage effectively the following methods for public comment and engagement on the Draft BAR were available:

- Written submissions via email, or telephone to the project manager:

Kirthi Peramaul

Alta van Dyk Environmental (Pty) Ltd
Postnet Suite #745
Private Bag X1007
Lytelton
0140

Tel: +27 12 940 9457 / Fax: +27 86 634 3967 / E-mail: kirthi@avde.co.za

DUE DATE FOR COMMENT ON DRAFT BAR WAS

13 December 2024

A stakeholder database was maintained throughout the process and comments received have been included in this Final Basic Assessment Report.

EXECUTIVE SUMMARY

Sibanye Rustenburg Platinum Mines (Pty) Ltd (SRPM)

Sibanye Rustenburg Platinum Mines (Pty) Ltd (SRPM) is a subsidiary entity within the Sibanye Stillwater Limited group of companies. The Kwezi Shaft operation is owned and operated by Sibanye Rustenburg Platinum Mines (Pty) Ltd. The current Kwezi Shaft Operations take place within an existing Mining Right Area NW30/5/1/2/2/80 MR (80 MR). The (SRPM) Mine Lease Area stretches over several Farms which includes operational areas such as the Kwezi Shaft Operation (current focus), K6 Shaft Operation, 4 Shaft Operation and the Klipfontein Opencast Operation project.

The Kwezi Shaft was approved in the 2002 EMPr: Rustenburg UG2 Phase 2 Project — Boschfontein East EMPr Amendment/Addendum Reference: RDNW (KL) 6/2/2/195 (5) EM.

Project Description

It is the intention of SRPM to expand the existing Mining Right Area (NW 30/5/1/2/2/80 MR) through the inclusion of UG2 Shallows Blocks (Blocks A and B).

Block A comprise of approximately 14 hectares, with an elongated rectangular footprint. Block B comprise of approximately 22 hectares in an elongated rectangle footprint. The targeted depth of the UG2 in Block A and B ranges between 40m and 80m. No new surface infrastructure will be required as the existing Kwezi Shaft will be utilised to access the additional blocks.

SRPM has undertaken a Section 102 application in terms of the Minerals and Petroleum Resources Development Act (Act 28 of 2002) for the amendment of Mining Right (80 MR). The DMRE (*now known as Department of Mineral and Petroleum Resources*) reference number for the Section 102 application is NW-00383-MR/102. In terms of the National Environmental Management Act (Act 107 of 1998) Environmental Impact Assessment Regulations General Notice 327, 2017 (as amended), a Basic Assessment process is required for the amendment of a Mining Right. A Section 102 Application will also be submitted to the amend the environmental authorisation.

Regulatory Approval Process

Before SRPM may commence with the development of the proposed expansion, the following environmental related approvals are required:

- A Basic Assessment process in terms of the National Environmental Management Act (Act 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 and Petroleum Resources (DMPR) previously known as Department of Mineral Resources and Energy (DMRE)
- Approval in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM:WA) (combined application in terms of NEMA and NEM:WA to be submitted to the DMPR).
- A Water Use Licence Application (WULA) in terms of the National Water Act (Act 36 of 1998). The competent authority for this process is the Department of Water and Sanitation (DWS).

Environmental Assessment Practitioner

Alta van Dyk Environmental Consultants (Pty) Ltd has been appointed as the independent Environmental Assessment Practitioners (EAP) for the project by SRPM to carry out the Basic Assessment process. A practice which entails amongst others site surveys, potential impact identification, identifying and describing alternatives, conducting public participation, as well as actual impact assessment and providing mitigatory measures for these potential impacts.

Specialist Studies

As part of the Basic Assessment Process, a team of independent specialists have been appointed as to undertake the required specialist studies. The aim of these studies is to identify and quantify the impacts associated with the proposed project, propose mitigation measures as to manage or mitigate these impacts and provide the required monitoring and auditing requirements. The specialist studies undertaken include the following:

- Blast and Stability Impact Assessment
- Heritage Compliance Statement
- Wetland Assessment
- Hydropedological Assessment
- Groundwater Impact Assessment

Identified Environmental Impacts

This Basic Assessment has provided a comprehensive assessment of the potential impacts associated with the proposed expansion. Where impacts were found to be potentially significant, various mitigation measures to manage and monitor the impacts of the proposed project have been proposed. A number of potential medium to high impacts have been identified that are associated with the operational and closure phases of the proposed activities. Risks of special mention relate to the impacts on groundwater, and ground vibration.

Public Participation

Public participation was undertaken during the Basic Assessment Process. The public participation process included the following activities:

- Distribution of Notification Letters / Emails indicating the availability of the Draft Basic Assessment Report
- Placement of Newspaper Advertisement
- SMS Notifications on the availability of the Draft Basic Assessment Report
- Focus Group Meeting with the Landowners on the 6 November 2024
- Availability of the Draft Basic Assessment Report
- Placement of the Draft Basic Assessment Report in the Sibanye Stillwater Ulwazi data free app
- Focus group meetings with Epol, Euro Sales and SA Breweries
- Once the 30 -day comment period was concluded, the comments received were captured in the Comments and Response Report and submitted with this Final Basic Assessment Report to the DMPR for consideration in the decision-making process.
- The Final Basic Assessment Report has also been made available on the Alta van Dyk Environmental Website

DECLARATION OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Alta van Dyk Environmental Consultants (Pty) Ltd (AvDE) has been appointed in terms of Regulation 12 of the NEMA EIA Regulations, 2014. The appointment is in line with Regulation 13 of the NEMA EIA Regulations, 2014, as AvDE is has been appointed as an independent Environmental Assessment Practitioner.

In accordance with Appendix 1 of the NEMA EIA Regulations, 2014, as amended, this serves as an affirmation by the Environmental Assessment Practitioner ("EAP") in relation to:

Section 3(1)(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.

AvDCG and the EAP managing this project hereby affirm that:

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



Kirthi Peramaul
Signature of Environmental Assessment Practitioner

Alta van Dyk Environmental Consultants (Pty) Ltd
Name of Company

03 February 2025

Date

ABBREVIATIONS

AvDCG	Alta van Dyk Corporate Group
AvDE	Alta van Dyk Environmental Consultants (Pty) Ltd
BA	Basic Assessment
BAR	Basic Assessment Report
BIC	Bushveld Igneous Complex
BID	Background Information Document
CA	Competent Authority
CBA	Critical Biodiversity Area
CP	Closure Plan
CRR	Comments and Response Report
DFFE	Department of Fisheries, Forestry and the Environment
DMRE	Department of Mineral Resources and Energy
DMPR	Department of Mineral and Petroleum Resources
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioner Association of South Africa
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GN	Government Notice
HIA	Heritage Impact Assessment
IDP	Integrated Development Plan
I&AP	Interested and Affected Party
IWRM	Integrated Water Resource Management
MPRDA	Minerals and Petroleum Resource Development Act (Act 28 of 2002)
MR	Mining Right
NDP	National Development Plan
NEM:AQA	National Environmental Management: Air Quality Act (Act 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEM:WA	National Environmental Management: Waste Act (Act 59 of 2008)
NEMA	National Environmental Management Act (Act 107 of 1998)
NHRA	National Heritage Resource Act (Act 25 of 1999)
NWA	National Water Act (Act 36 of 1998)
PGM	Platinum Group Metals
PPP/P3	Public Participation Process
Pt	Platinum
READ	Rural, Environmental and Agricultural Development
Rh	Rhodium
RLS	Rustenburg Layered Suite
RoD	Record of Decision
RPM	Rustenburg Platinum Mines
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resource Agency
SDF	Spatial Development Framework
SPLUMA	Spatial Planning and Land Use Management Act (Act 16 of 2013)
SS	Sibanye-Stillwater
WMA	Water Management Area
WULA	Water Use Licence Application



INTRODUCTION AND BACKGROUND

1. INTRODUCTION AND BACKGROUND

1.1 Background

Sibanye Rustenburg Platinum Mines (Pty) Ltd (SRPM) is a subsidiary entity within the Sibanye Stillwater Limited group of companies. Kwezi Shaft is owned and operated by Sibanye Rustenburg Platinum Mine (Pty) Ltd. The current Kwezi shaft area and Operations take place within an existing Mining Right Area NW30/5/1/2/2/80 MR (80 MR). The Sibanye Rustenburg Platinum Mine's (Pty) Ltd (SRPM) Mine Lease Area stretches over several Farms and includes operational areas such as the Kwezi Shaft Operation (current focus), K6 Shaft Operation, 4 Shaft Operation and the Klipfontein Opencast Operation project. **(Figure 1)**.

The 4 Shaft Operation is on care and maintenance whereas Kwezi Shaft and K6 Shaft are still operational.

The Kwezi Shaft was approved in the 2002 EMP: Rustenburg UG2 Phase 2 Project — Boschfontein East EMPR Amendment/Addendum Reference: RDNW (KL) 6/2/2/195 (5) EM.

It is the intention of SRPM to expand the Mining Right Area (NW 30/5/1/2/2/80 MR) through the incorporation of an area over a portion of portion 127 (now known as Rustenburg Ext 9) of the farm Rustenburg Town and Townlands 272 JQ (various erven) within Rustenburg, in the North West Province. The proposed expansion area lies at the border of the SRPM mining right and can be mined from the Kwezi Shaft **(Figure 2)**.

In addition to the expansion of the Mining Right Area, SRPM intends to mine the UG2 Shallows Blocks (Blocks A and B). Timely addition of the UG2 Shallows blocks to the existing Kwezi production profile is required to optimise existing critical mass.

SRPM has undertaken a Section 102 application in terms of the Minerals and Petroleum Resources Development Act (Act 28 of 2002) for the amendment of Mining Right (80 MR). The DMRE (*now known as DMPR*) reference number for the Section 102 application is NW-00383-MR/102. In terms of the National Environmental Management Act (Act 107 of 1998) Environmental Impact Assessment Regulations General Notice 327, 2017 (as amended), a Basic Assessment process is required for the amendment of a Mining Right.

Alta van Dyk Environmental Consultants (Pty) Ltd (AvDE) have been appointed as the independent Environmental Assessment Practitioner on the project to undertake the relevant environmental related application process and associated public participation process required to obtain Environmental Authorization.

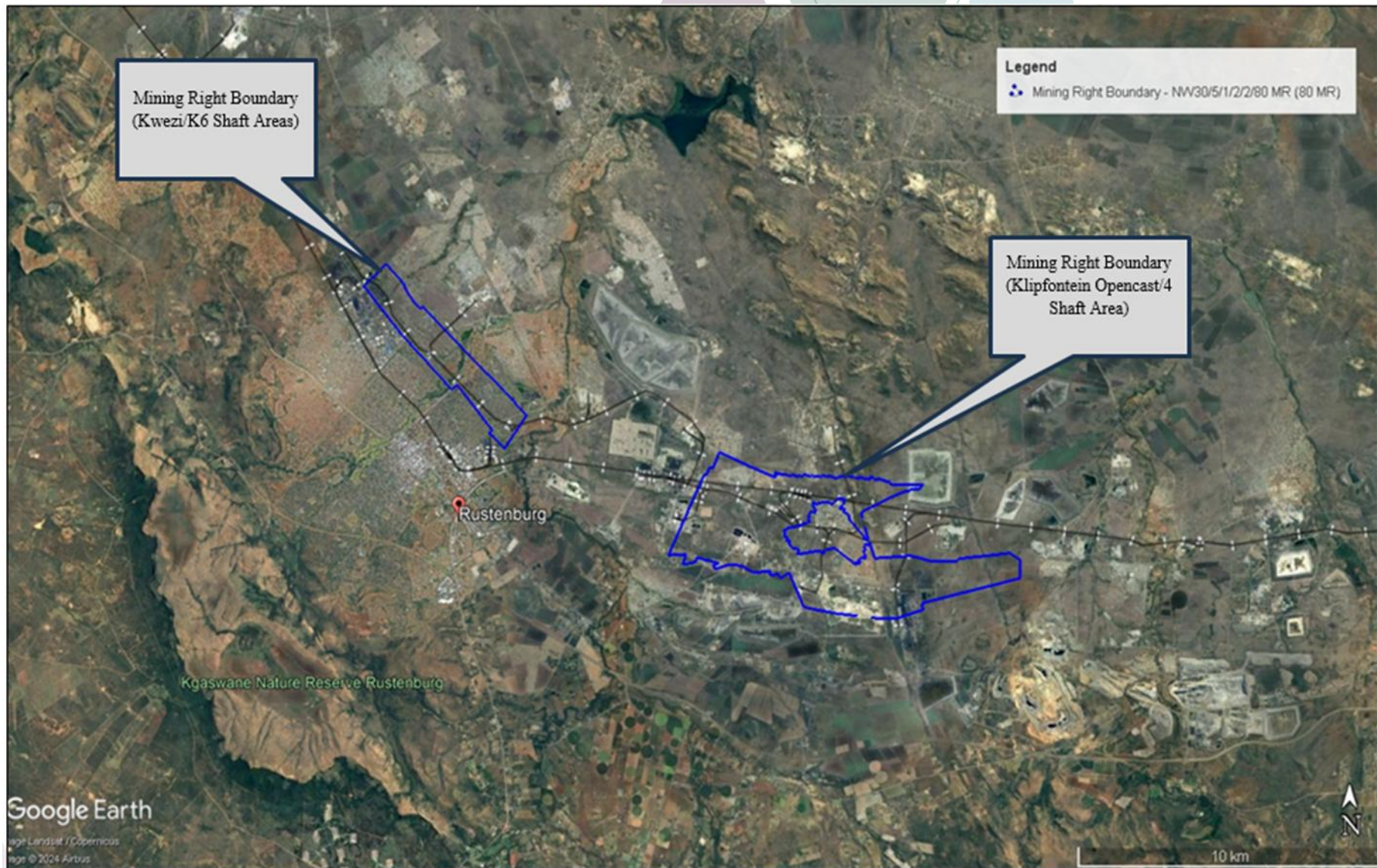


FIGURE 1: GOOGLE EARTH IMAGE SHOWING THE 80MR MINING RIGHT AREA

1.2 Purpose of the report

In terms of Section 38A of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) as amended (“MPRDA”), the DMPR is the responsible authority for the implementation of provisions of the National Environmental Management Act (Act No. 107 of 1998) (“NEMA”) in respect to mining.

A Basic Assessment (“BA”) process will support the expansion of the Mining Right area to include the mining of UG2 blocks (Block A and B). The DMPR Klerksdorp office is the Competent Authority (“CA”) in respect of the application for Environmental Authorisation.

This Basic Assessment Report (“BAR”) is in a format prescribed by the DMPR and has been compiled in support of the Environmental Authorisation process. The Final BAR documents the steps undertaken during the BA 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, 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 DMPR to decide whether (and under what conditions) to authorise the proposed project.

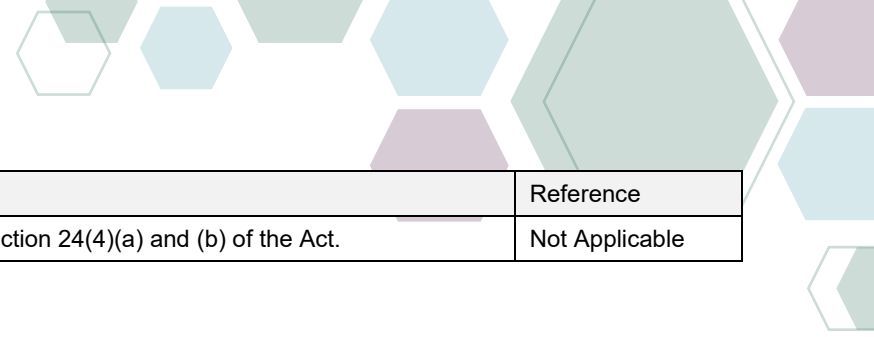
1.3 Content of the Final Basic Assessment Report

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

TABLE 1: REQUIREMENTS OF THE FINAL BASIC ASSESSMENT REPORT

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:	
	the EAP who prepared the report; and	Section 1.6
	the expertise of the EAP, including a Curriculum Vitae;	Section 1.6 Appendix A
b)	The location of the activity, including:	
	the 21-digit Surveyor General code of each cadastral land parcel	Table 5
	where available, the physical address and farm name;	Section 1.7
	where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	Not Applicable
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
d)	A description of the scope of the proposed activity, including:	
	All listed and specified activities triggered and being applied for	Section 3
	A description of the associated structures and infrastructure related to the development	Section 2
e)	A description of the policy and legislative context within which the development is proposed including	
	an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report;	Section 3
	how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section 3
f)	A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location	Section 4
g)	A motivation for the preferred site, activity and technology alternative	Section 5
h)	A full description of the process followed to reach the proposed development footprint within the approved site, including:	
	Details of all the alternatives considered;	Section 5
	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 6
	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	Section 6 Appendix D11
	the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 7
	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	Section 8
	the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives	Section 8.1
	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	Section 8
	The possible mitigation measures that could be applied and level of residual risk;	Section 8
	The outcome of the site selection matrix	Not Applicable
	If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	Not Applicable

No	Description	Reference
	A concluding statement indicating the preferred alternatives, including preferred location of the activity	Section 5
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:	
	A description of all environmental issues and risks that were identified during the environmental impact assessment process	Section 8
	An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Section 8
j)	An assessment of each identified potentially significant impact and risk, including:	
	Cumulative impacts	Section 8
	The nature, significance and consequences of the impact and risk	
	The extent and duration of the impact and risk	
	The probability of the impact and risk occurring	
	The degree to which the impact and risk can be reversed	
	The degree to which the impact and risk may cause irreplaceable loss of resources; and	
	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 8
l)	An environmental impact statement which contains-	
	A summary of the key findings of the environmental impact assessment	Section 8
	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	Not Applicable
	A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives	Section 8 Section 5
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;	Section 8
n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Section 12
o)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 1.9
p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Section 12
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	Section 12
r)	An undertaking under oath or affirmation by the EAP in relation to The correctness of the information provided in the reports The inclusion of comments and inputs from stakeholders and I&APs The inclusion of inputs and recommendations from the specialist reports where relevant; and Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	Page xi
s)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not Applicable
t)	Where applicable, any specific information required by the competent authority; and	Not Applicable



No	Description	Reference
u)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	Not Applicable



PROJECT DESCRIPTION

1.4 Structure of the report

The Final BAR has been structured as follows:

- Chapter 1 – Provides a general project description, details with regards to the impacted properties as well as the locality of the project.
- Chapter 2 – This chapter provides the existing approvals and infrastructure as well as the proposed project description.
- Chapter 3 – Provides the Legal Framework.
- Chapter 4 – Describes the needs and desirability's for the proposed project.
- Chapter 5 – Describes the alternatives considered as well as the no-go alternative.
- Chapter 6 – Summaries the Public Participation Process.
- Chapter 7 – Environmental Status Quo.
- Chapter 8 – This section summarises the Environmental Impact Assessment.
- Chapter 9 – Environmental Management Programme Report
- Chapter 10 – This chapter summaries the Monitoring and Reporting Requirements
- Chapter 11 – Financial Provision
- Chapter 12 _ Conclusion and Recommendations
- Chapter 13 – References.

1.5 Applicant Details

The applicant for the project is Sibanye-Rustenburg Platinum Mine (Pty) Ltd. Details are provided in **Table 2** below.

TABLE 2: APPLICANT DETAILS

Name	Sibanye-Rustenburg Platinum Mine (Pty) Ltd
Postal Address	Private Bag X508, Marikana 0284
Responsible Person	Phillip Ramphisa
Email	Phillip.Ramphisa@sibanyestillwater.com
Contact Number	014 495 1010

1.5.1 Pulling and Sharing Agreement

Sibanye Rustenburg Platinum Mines (Pty) Ltd is a subsidiary entity within the Sibanye Stillwater Limited group of companies. The Kwezi Shaft is owned and operated by Sibanye Rustenburg Platinum Mines (Pty) Ltd.

Aquarius Platinum South Africa previously owned and operated two platinum mining operations near Rustenburg in the Northwest Province, namely the Kroondal Platinum Mine and Marikana Mine. These two operations were collectively referred to as AQPSA's Western Limb operations.

In addition to the above-mentioned operations, AQPSA entered into a pooling and sharing agreement (PSA) with Valterra Platinum, previously Anglo American Rustenburg Platinum Mines Limited (RPM) - Rustenburg Section (RPM:RS) at the Kroondal operations in 2003. Further to this, AQPSA entered into a second PSA with RPM:RS at the Marikana operations, in 2006.

1.5.2 Mining Right

RPM:RS has divested a significant portion of one of its operating assets referred to as the "Rustenburg Section". The Rustenburg Section **previously** consisted, inter alia, of eight 'converted' mining rights granted under the transitional provisions of Schedule II of the Mineral and Petroleum Resources Development Act, 2002 (MPRDA), and a single new order mining right granted under section 23 of the (MPRDA). For ease of reference, the various mining rights are listed below:

- NW 30/5/1/2/2/43 MR (43 MR);
- NW30/5/1/2/2/79 MR (79 MR);

- NW30/5/1/2/2/80 MR (80 MR);
- NW30/5/1/2/2/81 MR (81 MR);
- NW30/5/1/2/2/82 MR (82 MR);
- NW30/1/2/2/83 MR (83 MR);
- NW30/1/2/2/84 MR (84 MR);
- NW30/1/2/2/85 MR (85 MR); and
- NW30/5/1/2/2/86 MR (86 MR).

The PSA Mining Areas (i.e. those portions of 80 MR, 81 MR, 83 MR and 86 MR which form part of the PSA) have been consolidated into 80 MR (the Consolidated PSA 80 MR). The Consolidated PSA 80 MR was previously held by RPM:RS.

In 2023, the PSA agreement concluded, and 80 MR transferred to be fully owned and operated by Sibanye Rustenburg Platinum Mines (Pty) Ltd. The Mining Right Area associated with 80 MR covers an area of 3212.9278 hectares (ha) and is valid until 28 July 2040. The Mining Right allows for the mining of minerals of Platinum Group Metals (i.e. platinum, palladium, rhodium, iridium, osmium and ruthenium, together with metals and minerals found in mineralogical association therewith, including but not limited to gold, silver, copper, nickel, cobalt and chrome together with any such other metals and minerals which may be extracted in the normal mining of the minerals in the UG2 and Merensky Reefs only.

1.6 Details of the EAP

The details of the EAP that prepared the report are provided in **Table 3** below.

TABLE 3: DETAILS OF THE EAP

Company	Alta van Dyk Environmental Consultants (Pty) Ltd ('AvDE')
Postal Address	Postnet Suite # 745 Private Bag X 1007 Lyttelton 0140
Telephone Number	012 940 9457
Fax Number	086 634 3967
Lead EAP	Kirithi Peramaul
Qualification	B.Sc Honours in Environmental Monitoring and Modelling
Professional Registration	EAPASA Registered EAP (Ref : 2020/1537)
Email Address	kirithi@avde.co.za

1.6.1 Summary of EAP Experience

Kirithi Peramaul– Senior Environmental Assessment Practitioner

Kirithi Peramaul (BSc Hons Environmental Monitoring and Modelling, Pr.Sci.Nat, Registered EAP). Kirithi has 13 years' experience in the environmental management field and is currently registered with the South African Council of Natural Scientific Professions (SACNASP) as a Professional Natural Scientist (Registration No 400012/18: Environmental Science) and is as a Registered Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (Registration No 2020/1537).

Kirithi specialises in environmental authorisations, environmental compliance monitoring, environmental management plans, water use authorisation, stakeholder engagement, risk assessments and blue and green drop auditing. She has been involved in projects related to Waste Management, Linear Infrastructure, as well as Mixed-Use developments.

Kirithi Peramaul and Alta van Dyk meet the requirements for independence as they 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 of the EAP's.

1.7 Locality

The proposed expansion project is located in the Rustenburg Local Municipality as well as within the Bojanala Platinum District Municipality. Kwezi Shaft is situated on Portion 1 of Town and Townlands of Rustenburg 272 JQ. The proposed project is for the expansion of the Mining Right Area to include the mining of Blocks A & B through the expansion of the Kwezi Underground Mining Operations. The properties associated with the proposed expansion is described in **Table 4**. **Table 5** provides details of the landowners in terms of the Windeed property reports. **Figure 3** shows the location of these properties in relation to the project area.

TABLE 4: DESCRIPTION OF THE PROPERTY

Farm Name	Portion 1 and Portion 127 (now known as Rustenburg Extension 9) of the farm Rustenburg Town and Townlands 272JQ Refer to Table 4 for details on the erven.
Landowner	Refer to Table 5
Application area (ha)	325.45 ha
Magisterial district	Rustenburg Local Municipality Bojanala Platinum District Municipality
Distance and direction from nearest town	Rustenburg – 1 km south
Ward Number	Ward 11 and 18
21 digit Surveyor General Code for each farm portion	Refer to Table 5

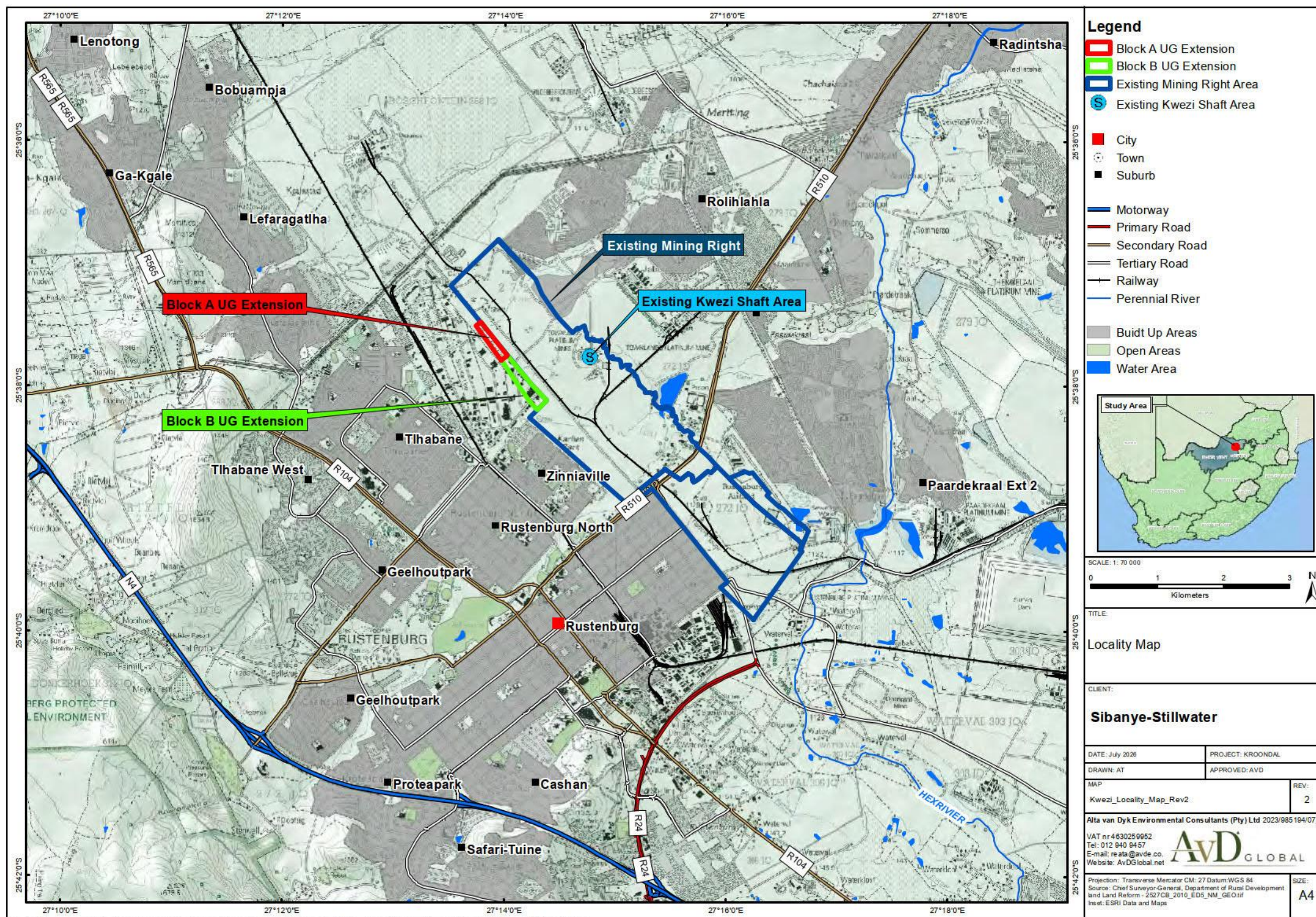


FIGURE 2: LOCALITY MAP

TABLE 5: LANDOWNERS APPLICABLE TO THE PROPOSED PROJECT

SG CODE	Erven	Portion	Description	Title Deed owner
T0JQ00270000229500000	2295	0	2295	Rustenburg Industrial Park CC
T0JQ00270000247600000	2476	0	2476	Coca-Cola Beverages South Africa Pty Ltd and Abi Bottling Pty Ltd
T0JQ00270000252900000	2529	0	2529	Amalgamated Beverage Industries Ltd
T0JQ00270000244700001	2447	1	1/2447	CONRADIE DESIREE LOUISE
T0JQ00270000244700002	2447	2	2/2447	Indvestic cc
T0JQ00270000244700003	2447	3	3/2447	Uptown Trading 305 cc
T0JQ00270000244700004	2447	4	4/2447	Ragie Abdul Aziz, Saloojee Ahmed Yusuf, Ebrahim Muhammed and Ragie Mohammed
T0JQ00270000244700005	2447	5	5/2447	Great Rhino INV cc
	2447	5	5/2447	Great Rhino INV cc
T0JQ00270000244700006	2447	6	6/2447	Are Ananeng Construction Pty Ltd
T0JQ00270000244700007	2447	7	7/2447	Sons and Joseph Motor Repairs
T0JQ00270000244700008	2447	8	8/2447	Essah Abdulsataar Omar
T0JQ00270000244700009	2447	9	9/2447	Erf 2447/9 Rustenburg cc
T0JQ00270000244700010	2447	10	10/2447	Wetzlar prop Pty Ltd
T0JQ00270000225800000	2258	0	2258	Waterflex Pty (Ltd)
T0JQ00270000225700000	2257	0	2257	Torero Inv 6 Pty Ltd
T0JQ00270000226500000	2266	0	RE/2266	Afri Ready Mix (Pty) Ltd
T0JQ00270000226600001	2266	1	1/2266	Afri Ready Mix (Pty) Ltd
T0JQ00270000242000000	2420	0	2420	Glencore Operations South Africa Pty Ltd
T0JQ00270000225600000	2256	0	2256	North West Recycling cc
T0JQ00270000226700000	2267	0	2267	ERF Rustenburg Ext 9, Rustenburg Municipality **For info refer to Registrar of Deeds**
T0JQ00270000226800000	2268	0	2268	ERF Rustenburg Ext 9, Rustenburg Municipality **For info refer to Registrar of Deeds**
T0JQ00270000226900000	2269	0	2269	Avron Property Holdings cc
T0JQ00270000225200000	2252	0	2252	Rustenburg Transitional Council
T0JQ00270000244700000	2447	0	RE/2447	MUN RUSTENBURG
T0JQ00270000232300000	2323	0	2323	Intersecting Park
	10385/1997001		10385/1997001	Intersecting Servitude

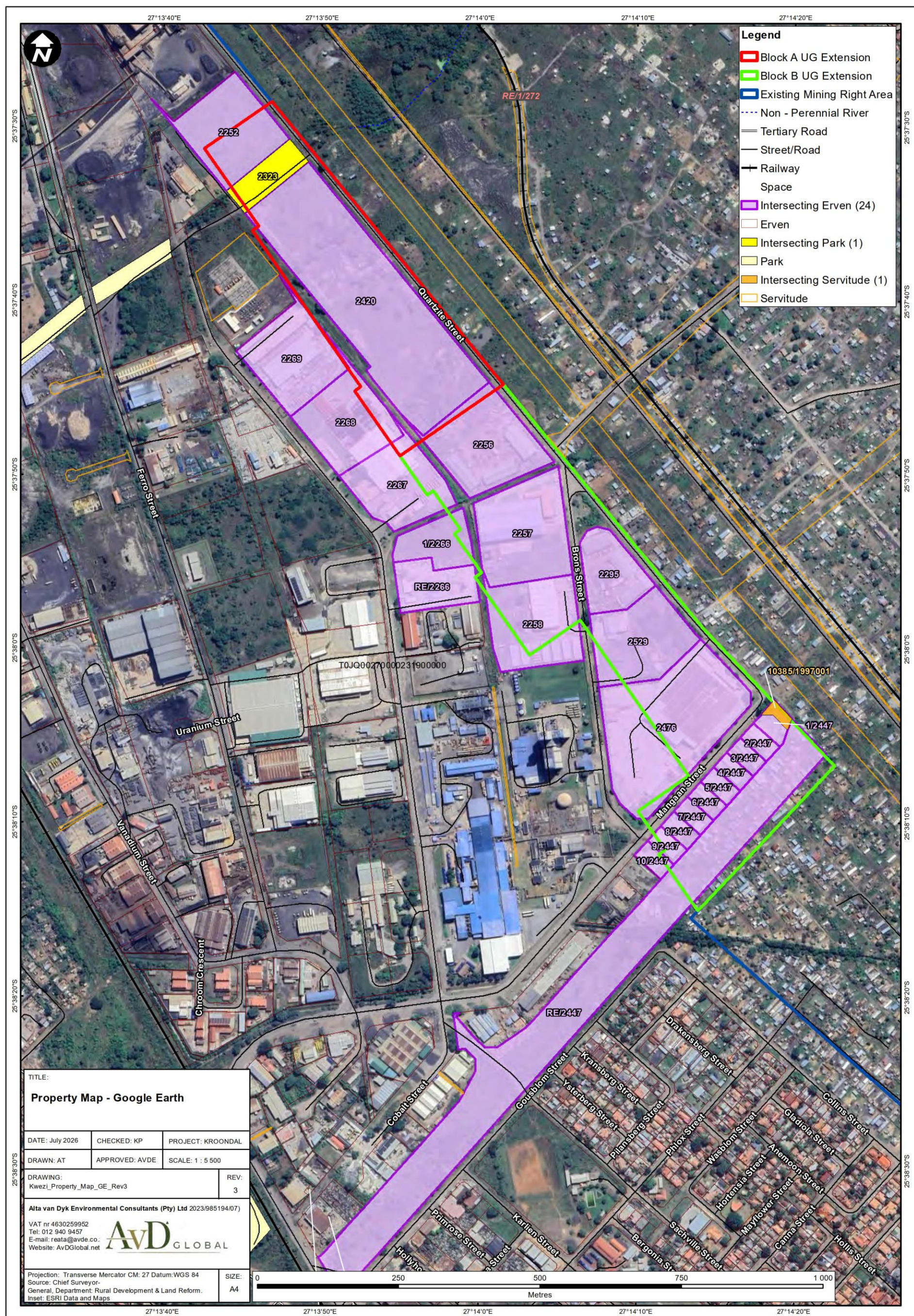


FIGURE 3 PROPERTY MAP

1.8 Site Sensitivity Verification

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 the NEMA, this Site Sensitivity Verification has been compiled to provide a rationale for the specialist studies undertaken as part of the environmental authorisation process and appended to the BAR. This section addresses the findings of the Department of Forestry, Fisheries and the Environment (“DFFE”) Screening Tool Report (**Appendix B**), 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 Environmental Screening Report compiled for the Block A and B, the proposed site is located within the following areas of sensitivity as indicated in **Table 6**.

TABLE 6: ENVIRONMENTAL SENSITIVITY OF THE PROJECT AREA (DFFE SCREENING TOOL) BLOCK A AND B

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture theme			X	
Animal species theme			X	
Aquatic biodiversity theme				X
Archaeological and cultural heritage theme				X
Civil aviation theme		X		
Defence theme				X
Palaeontology theme:			X	
Plant species theme				X
Terrestrial biodiversity theme:	X			

TABLE 7: ENVIRONMENTAL SENSITIVITY OF THE PROJECT AREA (DFFE SCREENING TOOL) SOUTH EAST OF BLOCK A & B.

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture theme		X		
Animal species theme			X	
Aquatic biodiversity theme	X			
Archaeological and cultural heritage theme	X			
Civil aviation theme		X		
Defence theme				X
Palaeontology theme:			X	
Plant species theme				X
Terrestrial biodiversity theme:	X			

It is important to note that **Table 7**, provides the site sensitivity of the block southeast of the proposed mining Blocks A and B. No mining is proposed for this Block and this block has been included as part of the application process for inclusion in the Mining Right Area.

Other than the specialist studies that have been commissioned and the impacts identified and assessed, some specialist studies suggested by the Screening Tool Report that were not considered. This is supported by a motivation as provided in **Table 8**.

TABLE 8: SPECIALIST STUDIES REQUIRED AS PER THE SCREENING TOOL REPORT AND RELEVANT MOTIVATION FOR BLOCK A AND B

Specialist Study	Included / not included	Motivation
Agricultural Impact Assessment	Not included	The proposed project is for the expansion of existing underground mining area at the Kwezi Shaft. The expansion of the underground area will not have an impact on the agricultural probability on surface. In addition, the above ground area is highly developed with several warehouses and offices.

Specialist Study	Included / not included	Motivation
Landscape/Visual Impact Assessment	Not included	The proposed project does not include any surface infrastructure. All existing surface infrastructure at Kwezi Shaft will be utilised. It is not expected that the expansion of an existing underground mining area will have a visual intrusion or a change in the sense of place.
Archaeological and cultural heritage impact assessment	Included	Even though there will be no surface disturbance, a Heritage Impact Statement has been undertaken to support the requirements of Section 38 (8) of the National Heritage Resources Act (Act 25 of 1999). Refer to Appendix C1.
Palaeontology Impact Assessment	Not included	According to the SAHRA Palaeontological Sensitivity Map, the site is characterised as insignificant/Zeo in terms of Palaeontological Sensitivity and no studies are required.
Terrestrial Biodiversity Impact Assessment	Not included	The proposed project is for the expansion of existing underground mining area at the Kwezi Shaft. The expansion of the underground area will not have an impact on the fauna and flora. In addition, the above ground area is highly developed with several warehouses and offices.
Aquatic Biodiversity Impact Assessment	Included	A Freshwater Impact Assessment has been undertaken to determine the presence/absent of watercourses and the potential impacts of undermining these watercourses. Refer to Appendix C2.
Hydrology Assessment	Not included	The proposed project does not include any surface infrastructure. Stormwater Management in terms of the existing surface infrastructure at Kwezi Shaft exists.
Noise Impact Assessment	Included	Blast and Stability Impact Assessment has been undertaken. Refer Appendix C5.
Radioactivity Impact Assessment	Not included	Not Applicable
Traffic Impact Assessment	Not included	The proposed project does not include any surface infrastructure. All existing surface infrastructure will be utilised. The Kwezi Shaft is currently operational with the ore being hauled for processing to the Kroondal Concentrators via an existing surface rail network.
Geotechnical Assessment	Not included	A Geotechnical Investigation has been commissioned as part of the engineering scope of work and not this Basic Assessment.
Climate Impact Assessment	Not included	The Kwezi operations is existing, and the site is currently monitoring their ambient air quality on a regular basis which is submitted to the Rustenburg Local Municipality.
Health Impact Assessment	Not included	Multiple management procedures and monitoring procedures like air, water, ground etc. are in place. Environmental impacts such as compromised ambient air quality, surface contamination, groundwater contamination, soil contamination and social related health pressures is assessed only through the determinants of health which are quantified as part of this Basic Assessment Process.
Socio-Economic Assessment	Not included	The operation is existing and operates in terms of its approved Social and Labour Plan and EMP commitments.
Ambient Air Quality Impact Assessment	Not included	The proposed project does not include any surface infrastructure and is for the expansion of the existing underground mine area.
Seismicity Assessment	Included	Blast and Stability Impact Assessment has been undertaken. Refer Appendix C5.
Plant Species Assessment	Not included	The proposed project is for the expansion of existing underground mining area at the Kwezi Shaft. The expansion of the underground area will not have an

Specialist Study	Included / not included	Motivation
		impact on the fauna and flora. In addition, the above ground area is highly developed with several warehouses and offices.
Animal Species Assessment	Not included	The proposed project is for the expansion of existing underground mining area at the Kwezi Shaft. The expansion of the underground area will not have an impact on the fauna and flora. In addition, the above ground area is highly developed with several warehouses and offices.

1.9 Assumptions and Limitations

The assumptions and limitations pertaining to this Final BAR are presented in **Table 9** below.

TABLE 9: ASSUMPTIONS AND LIMITATIONS

Aspect	Assumptions and Limitations
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 BA 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. - The potential impacts assessed in this report in relation to the proposed project is based on the assumption that the activities as provided in Section 8 of this report will be undertaken. Should there be substantial changes to the project scope, potential impacts may need to be re-evaluated. - The identification of listed activities in terms of the National Environmental Management Act (Act 107 of 1998) Environmental Impact Assessment ("EIA") Regulations and Waste Management Activities Government Notice 921 in Government Gazette 37083 dated 29 November 2013 in terms of the National Environmental Management Waste Act (Act 59 of 2008) were based on the existing information provided by the client and the fact the existing approvals are in place for all current activities on site.
Cumulative assessment	All identified impacts are considered in a cumulative manner such that the impacts of the current activities on and surrounding the site and those potentially associated with the proposed project are discussed and assessed together. The baseline conditions reflect the effects of these current activities.
Freshwater assessment (Scientific Aquatic Services)	- The determination of the freshwater ecosystem boundaries and the assessment thereof, is confined to the reaches of the freshwater ecosystems that traverse the study area and associated investigation area; - The study and investigation areas and their immediate surrounds have undergone historical transformation including agriculture, urbanisation and current and historic mining activities. As a result, various areas within the study and associated investigation area displayed transformed topography, soil profiles and runoff patterns within the landscape. As such, these disturbances have likely resulted in alterations to the hydroperiod of the identified freshwater ecosystems; - The data presented in this report is based on two (2) site visits undertaken in February 2022 and July 2024 (only for the additional areas i.e. Block A and B, the remaining MRA area was not re-assessed in the July 2024 assessment). The effects of natural seasonal and long-term variation in the freshwater ecosystem conditions in the system/s are, therefore, unknown; - It is important to note that although all data sources used provide useful and often verifiable, high-quality data, the various databases used do not

Aspect	Assumptions and Limitations
	always provide an entirely accurate indication of the actual site characteristics within the study area at the scale required to inform the EA process. However, this information is considered to be useful as background information to the study; • Global Positioning System (GPS) technology is inherently inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur. If more accurate assessments are required, the freshwater ecosystems will need to be surveyed and pegged according to surveying principles and with surveying equipment; • Wetland, riparian and terrestrial zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative species. • Within this transition zone, some variation of opinion on the freshwater ecosystem boundaries may occur. However, if the DWAF (2008) method is followed, all assessors should get largely similar results; and • With ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. It is, however, expected that the freshwater ecosystems that may be affected by the proposed underground mining operation have been accurately assessed and considered, based on the site observations undertaken in terms of freshwater ecosystem ecology.
Hydropedology (Zimpande Research Collaborative)	• The assessment was confined to the study area, and did not include the neighbouring and adjacent properties, although possible catchment impacts occurring on surrounding properties were taken into consideration. • Although the delineations of the hydropedological soils is confined to the boundaries of the study area, adjacent areas were considered to understand the hillslope processes which drive the watercourse response. • Sampling means that not all areas are assessed, and therefore some aspects of soil and hydropedological characteristics may have been overlooked in this assessment. However, it is the opinion of the professional soil specialist that the assessment was carried out with sufficient sampling and in sufficient detail to enable the proponent, the Environmental Assessment Practitioner (EAP) and the regulating authorities to make an informed decision regarding the proposed activity. • The effects of climate change dynamics were not considered as part this assessment; however, it is acknowledged that this might exacerbate the anticipated reduction in water inputs and the resultant hydrological function of the watercourse beyond the extent of the proposed development.



PROJECT DESCRIPTION

2. PROJECT DESCRIPTION

2.1 Description of Existing Activities at the Kwezi Shaft

2.1.1 Mining

Kwezi Shaft (previously known as 'Boschfontein East') is an underground platinum mining operation. Mining activities are limited to the extraction of ore from underground. No processing activities are taking place at the shaft. Various workshops have been constructed at Kwezi Shaft as support services to the underground mining activities. Supporting infrastructure include water storage dams that assist in ensuring effective process water re-use as well as supplying clean make-up water if required.

Current mining operations at Kwezi Shaft are underground, using the room and pillar mining method through the use of mechanised mining equipment. All mining takes place on the reef horizon, and all the ore is transported to surface via an underground conveyor system. The shaft has a main decline cluster consisting of three declines to provide access for the employees and machines to the underground workings.

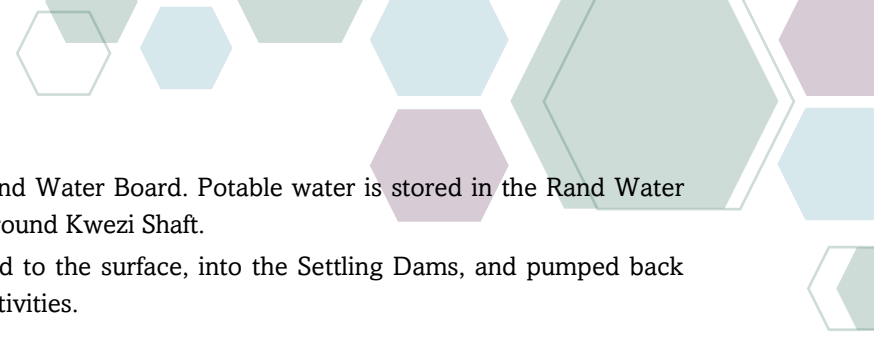
The decline clusters are typically equipped with a chair lift, a main decline conveyor, and a roadway for the mobile equipment. A room and pillar section typically consist of seven bords on strike, 6 to 10 m wide, with 6m to 8m x 6m x 8m pillars between the bords. Each section is equipped with a conveyor, to remove the ore to the main decline. The main decline transports the ore to the process plant from underground to the surface.

The mining in each section takes place by drilling and blasting of the ore and loading it onto the strike conveyor belt. The drilling is done with a mechanised drill rig and handheld rock drill machine. The blasted ore is removed from the face with Load Haul Dumpers (LHD). Additional to the pillars as primary support, roof bolts, long anchors of various lengths are also installed after blasting and cleaning of the face to ensure hangwall stability and safe working conditions.

The ore collected from underground is transported with a conveyor system to an ore storage silo situated on the surface. Ore is transported by railway from the ore storage silo to the processing plants situated at the Kroondal Operation.

The Kwezi Shaft has the following infrastructure:

- Main decline shaft
- Compressor house
- Bulk fuel and diesel storage area
- Explosives receiving area and magazine
- Offices and change houses
- Workshops and wash bay
- Salvage yard
- Conveyor belt from underground
- Ore storage silo
- Waste rock dump
- Rand Water Tank
- Ericson dam and underground dams
- Storm water dam
- Settling ponds
- General and hazardous waste storage areas
- Railway siding



Kwezi Shaft receives potable water from the Rand Water Board. Potable water is stored in the Rand Water Tank before being distributed to various areas around Kwezi Shaft.

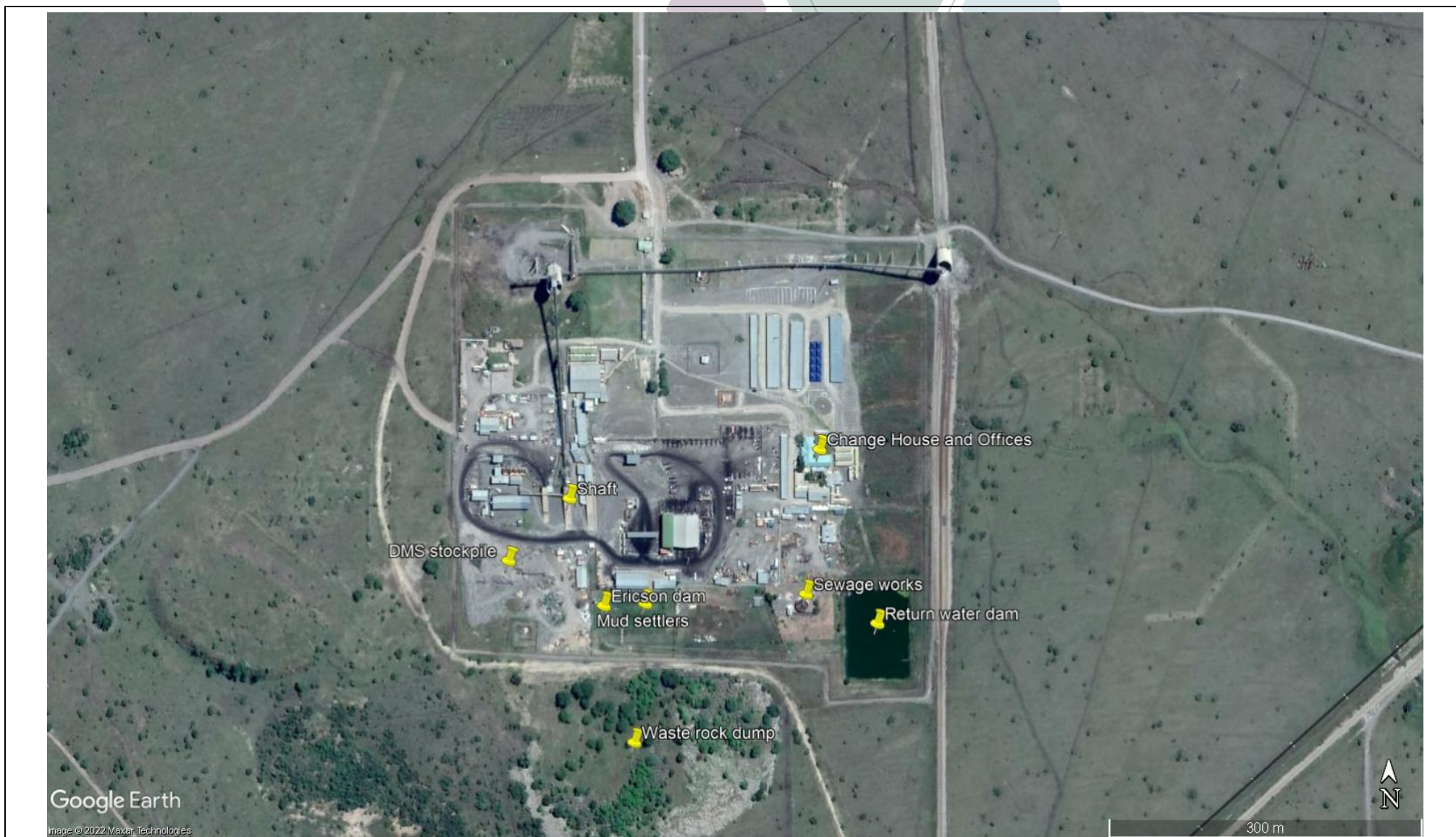
Underground water from Kwezi Shaft is pumped to the surface, into the Settling Dams, and pumped back underground via the Ericson Dam for process activities.



LOCATION OF KWEZI SHAFT



FIGURE 4: LOCATION OF THE KWEZI SHAFT



KWEZI SHAFT LAYOUT

Figure 1:2



FIGURE 5: KWEZI SHAFT LAYOUT

2.2 Description of Proposed Activities to be Undertaken

2.2.1 Proposed Expansion (UG Shallows Blocks A and B)

The Mining Right expansion area is shown in **Figure 6**. The area outlined in red and green shows the Mining Right Expansion area of UG2 shallow blocks (Block A & B) situated just outside of the existing mining right (NW 30/5/1/2/2/80 MR). The expansion area is approximately 36 ha. This application supports the expansion of the mining right area to include the mining of UG2 Blocks A and B, in order to increase the production and life of mine for the Kwezi Shaft.

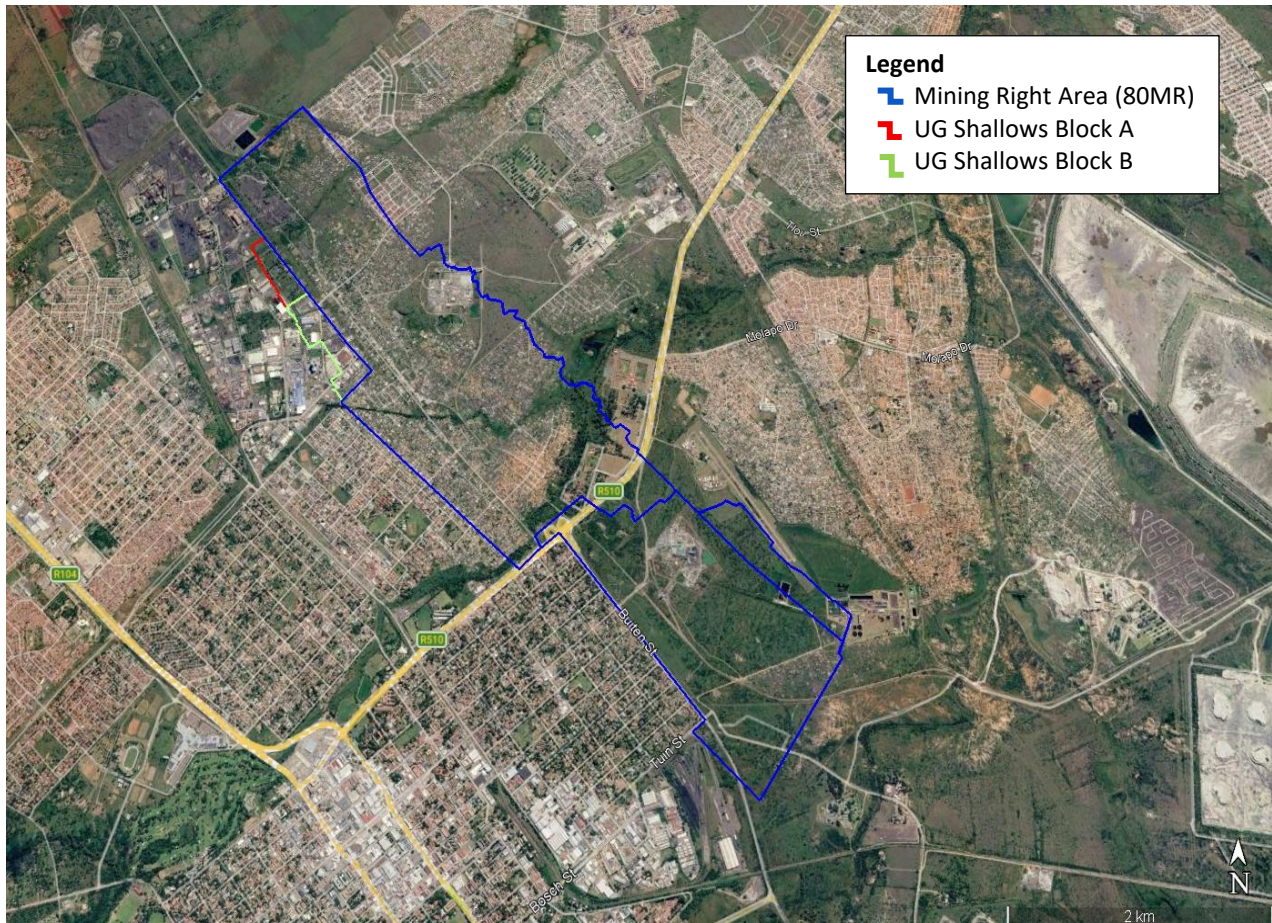


FIGURE 6: ILLUSTRATION OF BLOCK A & B IN RELATION TO THE MINING RIGHT (80MR) (SOURCE: GOOGLE EARTH)

The Kwezi Shaft is currently mining the UG2 reserve as within the mining lease limits described under the mining right NW 30/5/1/2/2/80 MR. **Figure 7** provides an illustration of the mined out areas within the Kwezi shaft area, the remaining reserves as well as the proposed expansion areas referred to as the UG Shallows (Blocks A and B). The Kwezi shaft is currently considered to be on their production decline phase with the expected life of mine to be until 2029.

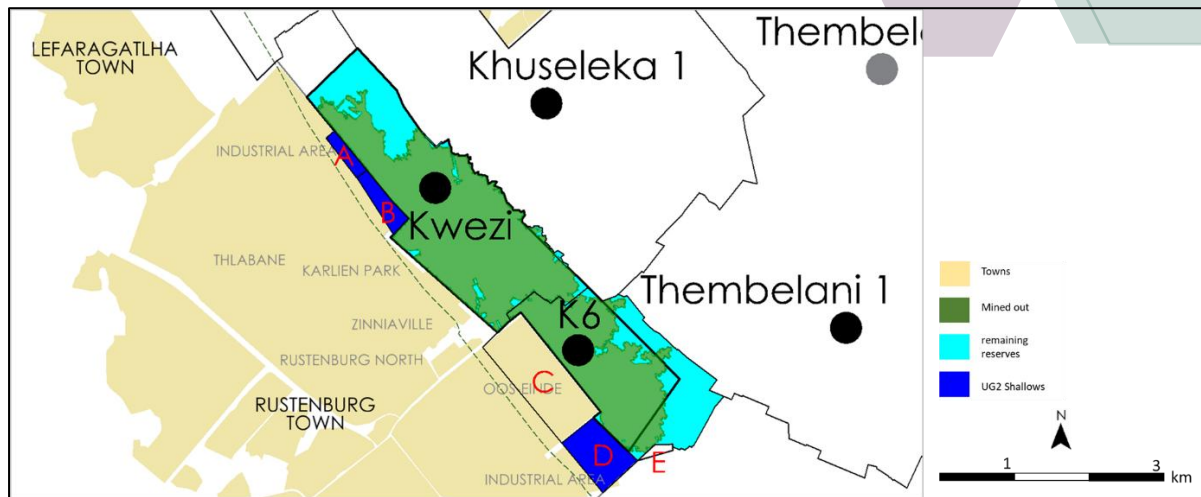


FIGURE 7: ILLUSTRATION ON 80 MR AND LOCATION OF UG2 SHALLOWS BLOCKS A & B

2.2.2 Surface Description (Blocks A and B)

Block A comprise of approximately 14 hectares, with an elongated rectangular footprint. The targeted depth of the UG2 in Block A ranges between 40m and 80m. No permanent building structures are present on the area denoted as Block A. Although no structures are present directly above the proposed Block A, there are considerable structures within a 100m horizontal distance from Block A. Structures include offices, warehouses, roads and a smelter. A Google Earth image of the proposed Block A is depicted in Figure 8.



FIGURE 8: GOOGLE EARTH IMAGE OF BLOCK A (ANNOTATED IN RED)

Block B comprise of approximately 22 hectares in an elongated rectangle footprint. Similar to Block A, the targeted UG2 lies between 40m and 80m below surface. Considerable development has taken place directly

above Block B. Development includes warehouses, offices and infrastructure such as electrical and road installations. A Google Earth image of the proposed Block B is depicted in **Figure 9**.



FIGURE 9: GOOGLE EARTH IMAGE OF BLOCK B (ANNOTATED IN GREEN)

2.2.3 Mining

No new surface infrastructure will be required as the existing Kwezi Shaft will be utilised to access the additional blocks.

As the proposed mining blocks will be an expansion of the existing Kwezi underground mining area, room and pillar mining method through the use of mechanised mining will be undertaken. All mining takes place on the reef horizon, and all the ore will be transported to surface via an underground conveyor system.

Waste rock will be removed in order to reach the ore. The waste rock remain underground and will be used in backfilling to promote stability in the mined out underground areas. No waste rock will be brought to the surface for placement on the existing Waste Rock Dumps.

2.2.4 Backfilling

The mined-out areas will be backfilled with oversize waste rock during the proposed mining of the UG2 Shallow mineral deposit. The scalping and waste packing methodology is aligned to current practiced at Kwezi Shaft which is located north of the UG2 Shallows mineral deposit.

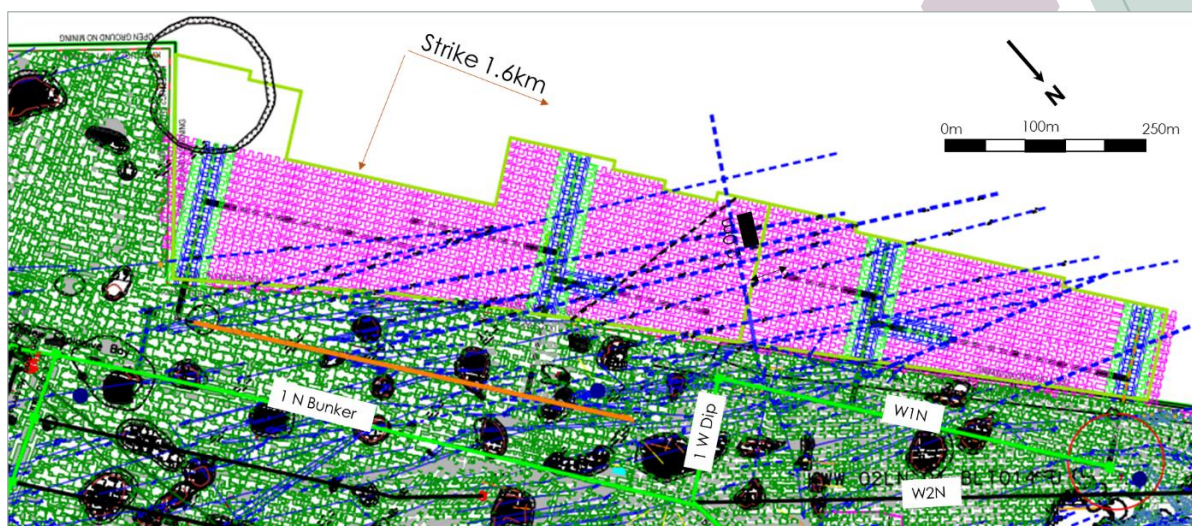


FIGURE 10: UNDERGROUND WORKING PLAN SHOWING OLD KWEZI WORKINGS AND PROPOSED UG2 SHALLOWING WORKINGS. SCALPING TONNES ARE PACKED IN DESIGNATED EXCAVATIONS IN OLD AREAS

The backfilling waste rock generated during proposed mining of the UG2 Shallows mineral deposit will consist of lumps greater than 34mm. This will be rejected waste rock that did not go through the tip grizzly. The tonnage of waste rock generated is the product of the blasting design (**Figure 10**) and tip grizzly apertures. The shaft is planning to use the blasting design and grizzly design aperture of 35mm X 35mm. Estimated tonnage of waste rock to be generated during the proposed life of mine of the UG2 Shallows mineral deposit is summarised below in **Table 10**.

TABLE 10: VOLUME OF BACKFILLING WASTE ROCK GENERATE DURING SCALPING PROCESS

	2025	2026	2027	2028	2029	Total
Scalping tonnes	3 465	7 935	11 054	7 454	65	29 972
t/m ³	3.40	3.40	3.40	3.40	3.40	3.40
M ³	1 018	2 331	3 247	2 189	19	8 803

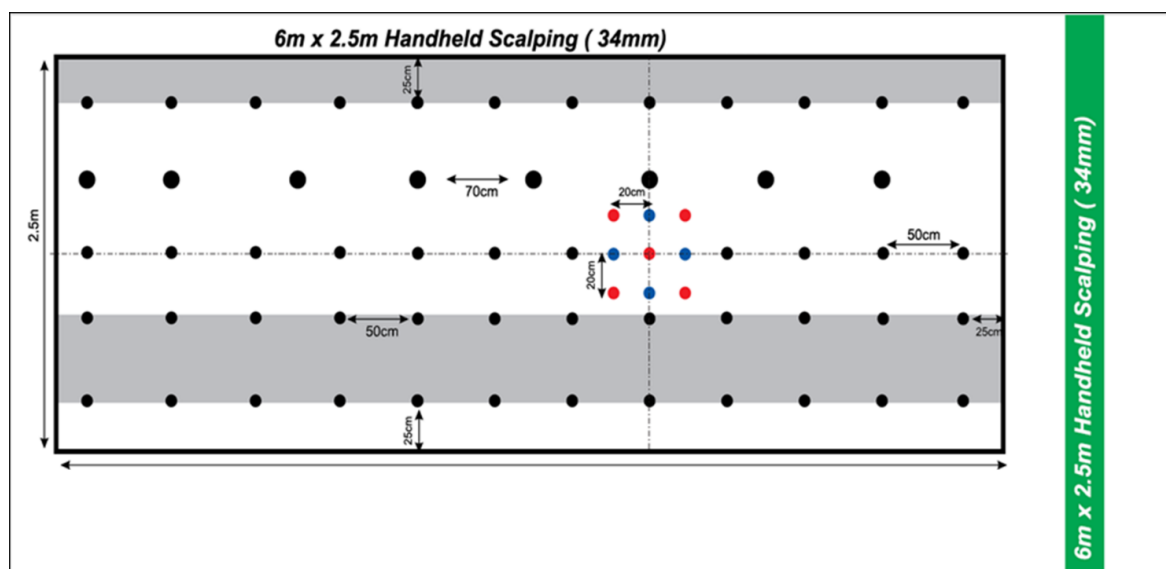
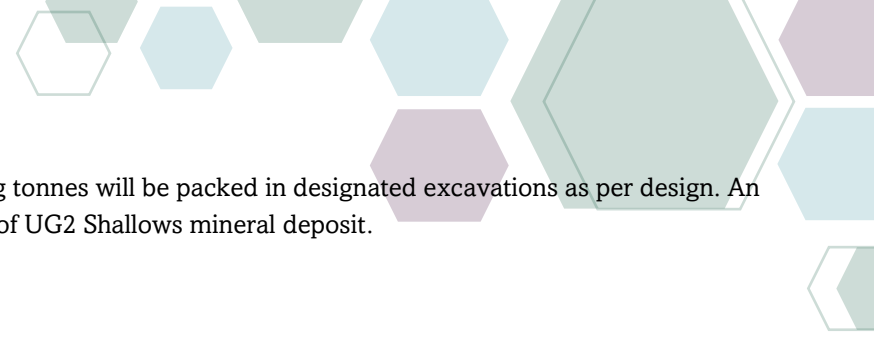


FIGURE 11: UG2 SHALLOWS BLAST DESIGN TO GENERATE WASTE LUMPS GREATER THAN 34MM

The oversize waste lumps from the tip grizzly will be loaded by the LHD and packed in designated scalping lines as per design. The blast design and grizzly apertures at Kwezi will produce 2.5% of scalping tonnes which will be



loaded from the tips as reject. These scalping tonnes will be packed in designated excavations as per design. An estimated of 29Kt will be packed for the life of UG2 Shallows mineral deposit.



LEGAL FRAMEWORK

3. LEGAL FRAMEWORK

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

The Constitution of South Africa compels all to ensure the rights of South African citizens. Section 24 of the constitution states that:

Everyone has the right-

- *to an environment that is not harmful to their health or well-being; and*
- *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.*

This right is binding on the state and people, both natural and juristic. Sustainable development is the cornerstone of South Africa's environmental law regime.

In fulfilment of its constitutional mandate to take reasonable legislative measures that give effect to Section 24 of the Constitution, the government has promulgated several environmental laws since 1994. These laws provide a legal framework that embodies internationally recognized legal principles. The principal act governing activities that affect the environment is the National Environmental Management Act, No 107 of 1998 ("NEMA") and National Environmental Management: Waste Act, Act 59 of 2008 ("NEM:WA") while the principal act governing activities that affect water resources is the National Water Act, Act 36 of 1998 ("NWA").

The issuing of authorisations in terms of NEMA, NEM:WA, NWA or any other permits or licence for any aspect of the proposed projects will ensure that the environmental right enshrined in the Constitution contributes to the protection of the biophysical and socio- economic environment. The abovementioned authorisations, permits, or licences will be largely based on the legislation outlined in this Chapter (Chapter 3).

3.2 The Minerals and Petroleum Resources Development Act (Act 28 of 2002) ("MPRDA") as amended on 21 April 2009

The fundamental principles of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) ("MPRDA") are:

- Mineral resources are non-renewable.
- Mineral resources belong to the nation and the State is the custodian.
- Protection of the environment for present and future generations to ensure sustainable development of the resources by promoting economic and social development.
- The need to promote local and rural development of communities affected by mining.
- Reformation of the industry to bring about equitable access to the resources and eradicating discriminatory practices; and
- Guaranteeing security of tenure.

The MPRDA sets forth the governing act/legislation to lawfully proceed with the commencement of mining and mining related activities.

3.2.1 Application for a Mining Right

Section 22 ("*Application for Mining Right*") of the MPRDA addresses mining rights. This section states:

22. (1) *Any person who wishes to apply to the Minister for a mining right must simultaneously apply for an environmental authorisation and must lodge the application –*

- (a) *At the office of the Regional Manager in whose region the land is situated.*
- (b) *In a prescribed manner; and*
- (c) *Together with the prescribed non-refundable application fee.*

(2) *The Regional Manager must, within 14 days of receipt of the application accept an application for a mining right if –*

- (a) *The requirements contemplated in subsection (1) are met.*
- (b) *No other person holds a prospecting right, mining right, mining permit or retention permit for the same mineral or land; and*
- (c) *No prior application for a prospecting right, mining right or mining permit or retention permit, has been accepted for the same mineral and land and which remains to be granted or refused.*

(3) *if the application does not comply with the requirements of this section, the Regional Manager must notify the applicant in writing within 14 days of the receipt of the application.*

(4) *if the Regional Manager accepts the application, the Regional Manager must, within 14 days from the date of acceptance, notify the applicant in writing –*

- (d) *To submit the relevant environmental reports, as required in terms of Chapter 5 of the National Environmental Management Act, 1998, within 180 days from the date of the notice.*
- (e) *To consult in the prescribed manner with the landowner, lawful occupier and any interested and affected party and include the result of the consultation in the relevant environmental reports.*

(5) *The Regional Manager must, within 14 days of receipt of the environmental reports and results of the consultation contemplated in subsection (4) and section 40, forward the application to the Minister for Consideration.*

SRPM holds an approved Mining Right under the DMRE (*now known as DMPR*) reference NW30/5/1/2/2/80MR, which is valid until 28 July 2040.

3.2.2 Amendment of rights, permits, programmes and plans

Section 102 (“*Amendment of Rights, Permits, Programmes and Plans*”) of the MPRDA addresses amendments to already approved authorisations in terms of mining and mining related activities. This section states:

(1) “A reconnaissance permission, prospecting right, **mining right**, mining permit, retention permit, technical corporation permit, reconnaissance permit, exploration right, production right, prospecting work programme, exploration work programme, production work programme, mining work programme, **environmental management programme or an environmental authorisation issued in terms of the National Environmental Management Act, 1998**, as the case may be, may not be amended or varied (including by extension of the area covered by it or by the additional of minerals or a shares or seams, mineralised bodies or strata, which are not at the time the subject thereof) without the written consent of the Minister.

SRPM has submitted a Section 102 application to the DMRE (*now known as DMPR*) on the 29 August 2024 (Reference NW-00383-MR/102) for the amendment of Mining Right NW 30/5/1/2/2/80 MR to include the UG2 and Merensky Reefs over the Onalenna PR area into the SRPM area. The Section 102 Application also is to include chrome ore into the S102 area over the UG2 and Merensky Reefs.

3.3 National Environmental Management Act (Act 107 of 1998) (“NEMA”)

The National Environmental Management Act (Act No. 107 of 1998) (“NEMA”) is the environmental framework legislation promulgated to ensure that the environmental rights contemplated in Section 24 of the Constitution of South Africa (Act 108 of 1996) are realised. NEMA sets out:

- The fundamental principles that need to be incorporated in the environmental decision-making process.
- The principles that are necessary to achieve sustainable development.

- Provides for duty of care to prevent control and rehabilitate the effect of significant pollution and environmental degradation; and
- It allows for the prosecution of environmental crimes.

3.3.1 Application for Environmental Authorisation

In terms of the Section 24(5) read with Section 44 of the Act, Environmental Impact Assessment (“EIA”) Regulations have been published that provide a list of activities that may require either a Basic Assessment (“BA”) or a Scoping and Environmental Impact Assessment (“S&EIA”) process to be followed as to authorise their lawful undertaking. These listed activities have been gazetted as follows.

- Listing Notice 1: Activities requiring a Basic Assessment environmental authorisation process.
 - Government Notice No. 983 in Gazette No. 38282 on 4 December 2014, as amended on 7 April 2017 in Gazette No. 40772 as Government Notice No. 327
- Listing Notice 2: Activities requiring a Scoping and Environmental Impact environmental authorisation process; and
 - Government Notice No. 984 in Gazette No. 38282 on 4 December 2014, as amended on 7 April 2017 in Gazette No. 40772 as Government Notice No. 325
- Listing Notice 3: Activities within certain geographic / sensitive areas requiring a Basic Assessment environmental authorisation process.
 - Government Notice No. 985 in Gazette No. 38282 on 4 December 2014, as amended on 7 April 2017 in Gazette No. 40772 as Government Notice No. 324
- National Environmental Management Act, 1998 (Act No. 107 of 1998), Amendment to the Environmental Impact Assessment Regulations, Listing Notice 1, Listing Notice 2 and Listing Notice 3 of the Environmental Impact Assessment Regulations, 2014 for activities identified in terms of Section 24(2) and 24D of the National Environmental Management Act, 1998 (Act No 107 of 1998). Gazette Notice 517 No. 40701 dated 11 June 2021.

Table 11 below records the listed activities triggered and applied for in support of this project.

TABLE 11: TRIGGERED LISTED ACTIVITIES FOR THE PROPOSED PROJECT (NEMA)

Applicable Listing Notice	Listed Activity	Listed Activity Description	Project Activity Description	Extent of Activity
Listing Notice 1 Activities (Government Notice R 983, as amended in 2017, 2018 and 2021)				
GNR 327 Listing Notice 1	Activity 21D	Any activity including the operation of that activity which requires an amendment or variation to a right or permit in terms of section 102 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity contained in this Listing Notice or in Listing Notice 3 of 2014, required for such amendment.	Amendment to the Sibanye Rustenburg Platinum Mines Mining Right (80 MR) to include the UG2 Shallows Blocks A and B.	~36 ha
GNR 327 Listing Notice 1	Activity 34	The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution, excluding- (i) where the facility, infrastructure, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; (ii) the expansion of existing facilities or infrastructure for the treatment of effluent, wastewater, polluted water or sewage where the capacity will be increased by less than 15 000 cubic metres per day; or (iii) the expansion is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will be increased by 50 cubic metres or less per day.	Backfilling of the proposed mining blocks A and B with waste rock.	~36 Ha

3.4 National Environmental Management: Waste Act (Act 59 of 2008) (“NEM:WA”)

According to the National Environmental Management: Waste Act (Act No. 59 of 2008) (“NEM:WA”), the purpose of the legislation is:

- *To regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.*
- *To provide for institutional arrangements and planning matters*
- *To provide for national norms and standards for regulating the management of waste by all spheres of government*
- *To provide for specific waste management measures*
- *To provide for the licensing and control of waste management activities*
- *To provide for the remediation of contaminated land*
- *To provide for the national waste information system*
- *To provide for compliance and enforcement; and*
- *To provide for matters connected therewith.*

Part 4, Section 19 (1) of NEM:WA states that “*The Minister may by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment*” and must by notice “indicate whether a waste management licence is required to conduct the activity or, if a waste management licence is not required, the requirements or standards that must be adhered to when conducting the activity.”

The Minister has gazetted Waste Management Activities in respect of which a waste management licence is required in terms of Section 19 and 20 of the Act. These listed waste activities have been gazetted as follows:

- Government Notice 921 in Government Gazette 37083 dated 29 November 2013 as amended by:
 - Gazette Notice 633 in Government Gazette dated 25 July 2015.
 - Government Notice No. 1440 dated 25 November 2016 Regulations regarding the planning and management of residue stockpiles and residue deposits:
 - Gazette Notice 242 in Government Gazette 40698 dated 17 March 2017.
 - Gazette Notice 1094 in Government Gazette 41175 dated 11 October 2017.
 - Gazette Notice 1757 in Government Gazette 45907 dated 11 February 2022.

The amended list of waste management activities that have or are likely to have a detrimental effect on the environment are specified and classified in terms of three categories namely, Category A, B and C waste activities under NEMWA.

Waste management activities triggered by the proposed project is detailed in **Table 12**.

TABLE 12: TRIGGERED ACTIVITIES FOR THE PROPOSED EXPANSION (NEM:WA)

Applicable Listing Notice	Listed Activity	Listed Activity Description	Project Activity Description	Extent of Activity
<i>Listing Notice 1 Activities (Government Notice R 983, as amended in 2017, 2018 and 2021)</i>				
GN921- 29 November 2013 (as amended)	Category A: Activity 13	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.	This activity is triggered in support of the expansion Kwezi shaft mining areas, specifically relating to the waste rock that will result from the mining activities. The waste rock will not be brought to surface and will be packed underground	36 Ha

Transitional Arrangements in terms of NEM:WA

The Kwezi Shaft was approved in the 2002 EMPr: Rustenburg UG2 Phase 2 Project — Boschfontein East EMPr Amendment/Addendum Reference: RDNW (KL) 6/2/2/195 (5) EM. The Kwezi shaft was approved prior to the promulgation of the National Environmental Management: Waste Act in 2008/9 and as such no Waste Management Licence was required for the construction of the facility by SRPM.

- GNR 921 Government Gazette No. 37083 (as amended)
 - *Section (7)(1) – “A person who lawfully conducts a waste management activity in this Schedule on the date of coming into effect of this Notice may continue with the waste management activity until such time that the Minister by notice in a Gazette calls upon such a person to apply for a waste management licence”.*
 - The Kwezi Shaft and associated mining did not require a Waste Management Licence as the facility was approved prior to 2009 and the promulgation of Government Notice 718, Government Gazette No. 32368 (Listed Waste Activities).

3.5 National Water Act (Act 36 of 1998) (“NWA”)

The purpose of the National Water Act (Act No. 36 of 1998) (“NWA”) is to ensure that the nation’s water resources are protected, used, developed, conserved, managed, and controlled. Use of water for mining and

related activities is also regulated through regulations that were updated after the promulgation of the NWA (Government Notice GN704 dated 4 June 1999).

Sections 40 and 42 of NWA provides for the responsible authority to request public participation and an assessment of the likely effect of the proposed license for the protection, use, development, conservation, management, and control of the water resource.

The following chapters of the NWA are of importance:

- Chapter 3, Part 4 states that anyone who owns, occupies, controls, or uses land is deemed responsible for taking measures to prevent pollution of water resources.
- Chapter 4 deals with water use regulation.
- Chapter 12 deals with water management in terms of dam safety.
- Section 19 deals with water management at mines in terms of pollution prevention and control.
- Section 21 defines the water uses requiring authorization.
- Section 26 (1) provides for the development of regulations requiring monitoring, measurement and recording as well as the effects to be achieved through management practices prior to discharge or disposal.

3.5.1 Approved Water Use License

A Water Use Licence (WUL) was issued for the K5 (Kwezi) operation on 24 June 2011 (Licence No: 03/A22H/AG/726). This licence expired on 23 June 2020. However, an extension was requested on 22 June 2020, for an additional nine (9) years. This extension was granted on 11 June 2021.

A WUL Application was submitted in 2023 – e-WULAAS Reference WU19406 for the following water uses:

- Dewatering of the Kwezi Shaft – Section 21 (a) – This water use was authorised in the 2011 WUL, however, the abstraction volume needs to be increased. Volume applied for is 600 000 m3
- Dewatering of Kwezi Shaft – Section 21 (j) – Removing of water from underground is necessary for the efficient continuation of the mining activity for the safety of people
- Undermining of the Dorpspruit and delineated wetland- Section (c) & (i).

The decision is yet to be made by the DWS.

3.5.2 Application for a Water Use Licence

Section 21 of the NWA defines 11 consumptive and non-consumptive water uses that require authorisation prior to their commencement / undertaking. The applicable water uses to the project is indicated in bold.

- 21(a): Taking water from a water resource.
- 21(b): Storing water
- **21(c): Impeding or diverting the flow of water in a watercourse.**
- 21(d): Engaging in a stream flow reduction activity.
- 21(e): Engaging in a controlled activity.
- 21(f): Discharging waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit.
- **21(g): Disposing of waste in a manner which may detrimentally impact on a water resource.**
- 21(h): Disposing in any manner of water which contains waste from, or which has been heated in any industrial or power generation process.
- **21(i): Altering the bed, banks, course, or characteristics of a watercourse.**
- 21(j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.
- 21(k): Using water for recreational purposes.

Water uses that are not permissible in terms of Schedule 1 of the NWA need to be authorised under a tiered authorisation system as a General Authorisation (“GA”) in terms of the General Authorisation Regulations as published under section 39 of the NWA or as a Water Use Licence (“WUL”), as provided for in terms of section 21 of the NWA.

The authorisation system allows for the “Reserve” and provides for public consultation processes in the establishment of strategies and decision making and guarantees the right to appeal against such decision.

Section 27 of the NWA specifies that the following factors regarding water use authorisation be taken into consideration:

- The efficient and beneficial use of water in the public interest.
- The socio-economic impact of the decision whether to issue a licence.
- Alignment with the catchment management strategy.
- The impact of the water uses and possible resource directed measures; and.
- Investments made by the applicant in respect of the water use in question.

The NWA introduced the concept of Integrated Water Resource Management (“IWRM”), comprising all aspects of the water resource, including water quality, water quantity and the aquatic ecosystem quality. The IWRM approach provides for both resources directed, and source directed measures. Resource directed measures aim to protect and manage the receiving environment, whilst source directed measures aim to control the impacts at source.

Table 13 provides a description of the water uses required in support of this project.

TABLE 13: TRIGGERED ACTIVITIES IN TERMS OF THE NWA

National Water Act – Water Uses	
Water Use Identified	Description
Section 21(c) and (i): Impeding or diverting the flow of water within a water course. And altering the beds, banks, course or characteristics of a watercourse.	Undertaking of mining activities within 500m of the delineated wetland.
Section 21(g) – disposing of waste in a manner which may detrimentally impact on a water resource.	Backfilling of the proposed mining blocks A & B

3.5.3 Regulations on the use of water for Mining and related activities aimed at the protection of water resources - GN704 dated 4 June 1999

The Minister of Department of Water and Sanitation (DWS) is responsible for the protection, use, development, conservation, management, and control of the water resources of South Africa on a sustainable basis.

As such the DWS has gazetted regulations specifically aimed at the use of water for mining and related activities aimed at the protection of water resources. These requirements prescribed in terms of the regulations must be seen as minimum requirements to fulfil this goal.

In terms of Regulation 3 of the Act the Minister may in writing authorise an exemption from the requirements of regulations 4, 5, 6, 7, 8, 10 or 11 of the Act on his or her own initiative or on application, subject to such conditions as the Minister may determine.

The table below records the anticipated GN704 exemptions required and to be applied for in terms of the NWA to support the proposed expansion. This application (GN704 Exemption Motivation in terms of NWA) will run in parallel with the Basic Assessment and WULA Process.

TABLE 14: GN704 REQUIREMENTS

GN 704	Condition	Applicability to the proposed Project
4 a	No person in control of a mine or activity may locate or place any residue deposit, dam, reservoir, together with any associated structure or any other facility within the 1:100 year flood-line or within a horizontal distance of 100 metres from any watercourse or estuary, borehole or well, excluding boreholes or wells drilled specifically to monitor the pollution of groundwater, or on water-logged ground, or on ground likely to become water-logged, undermined, unstable or cracked.	Underground mining activities within 100m from the watercourse
4b	No person in control of a mine or activity may- except in relation to a matter contemplated in regulation 10, carry on any underground or opencast mining, prospecting or any other operation or activity under or within the 1:50 year flood-line or within a horizontal distance of 100 metres from any watercourse or estuary, whichever is the greatest.	Underground mining activities within 100m from the watercourse
4 c	No placement or disposal of any residue or substance which causes or is likely to cause pollution of a water resource, in the underground workings or opencast excavation, prospecting diggings, pit or any other excavation.	Use of overburden material for the backfilling/backlashing of the underground workings

A GN704 motivation has been compiled in support of the WUL application. Th GN704 Motivation has been included as Appendix F.

3.6 National Environmental Management: Biodiversity Act (Act 10 of 2004) (“NEM:BA”)

NEM:BA serves to provide a framework for the management and conservation of South African biodiversity, under the auspices of the NEMA. The purpose of the act is to provide for the:

- Management and conservation of South Africa’s biodiversity within the framework of the NEMA;
- The protection of species and ecosystems that warrant national protection;
- The sustainable use of indigenous biological resources;
- The fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources;
- The establishment and functions of a South African National Biodiversity Institute

Chapter 7 of the NEMBA regulations govern the ‘permit system for listed threatened or protected species’. In order to remove or relocate any Threatened species or Protected species identified on the site, the relevant permits must be applied for. The proposed project does not include any surface infrastructure.

3.7 National Heritage Resources Act (Act 25 of 1999) (“NHRA”)

The objective of the NHRA 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. Section 38 of this Act pertains to Heritage resources management and Section 38(1) states the following:

Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50 m in length;*
- (c) any development or other activity which will change the character of a site—*

- (i) exceeding 5 000 m² in extent; or*
 - (ii) involving three or more existing erven or subdivisions thereof; or*
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*
 - (d) the re-zoning of a site exceeding 10 000 m² in extent; or*
 - (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,*
- must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

(8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent

A Heritage Compliance Statement has been undertaken in line with the requirements set forth in Section 38 (8) of the NHRA. The South African Heritage Resource Agency ("SAHRA") were informed of the proposed project, and the Draft BAR was loaded on SAHRIS for comment. SAHRA has provided their comments on the DBAR which has been included as part of the Final Basic Assessment Report.

3.8 Other Applicable Legislation

Various National, Regional and Local legislation (in addition to NEMA, NEM:WA and NWA) will be taken into consideration for applicability to support the lawful commencement of the various proposed projects on site. These National, Regional and Local legislation will be assessed in terms of assessing triggered activities, additional possible permit requirements, specialist assessments (criteria) and mitigation measure development and will be discussed in detail in each of the respective reports / applications. The list below highlights only a few of the additional legislation assessed for the proposed projects:

- National Environmental Management Air Quality Act, 2008 ("NEM:AQA") (Act 39 of 2004) as amended.
- Conservation of Agricultural Resources Act, 1983 ("CARA") (Act 43 of 1983)
- Spatial Planning and Land Use Management Act, 2013 ("SPLUMA") (Act No 16 of 2013)
- Rustenburg Local Municipality By-Laws
- Bojanala Platinum District Municipality By-Laws

Permits in terms of all applicable National, Regional and Local legislation (*if required*) will be obtained prior to the commencement of construction activities.



NEED AND DESIRABILITY OF THE PROJECT

4. NEED AND DESIRABILITY OF THE PROJECT

The needs and desirability of the proposed expansion of the underground mining area has taken into consideration the principles of NEMA, the sustainable development objectives, programmes and broader community needs within the National Development Plan (“NDP”), the Rustenburg Integrated Development Plan (“IDP”) (2022/2027) and the 2018 Spatial Development Framework (“SDF”). While the importance of job creation and economic growth for South Africa cannot be denied, the Constitution calls for justifiable economic development. The specific needs of the broader community are to be considered together with the opportunity, costs and consequences of the proposed activities in order to determine whether or not the development will be socially, economically and environmentally sustainable.

4.1 Project Need

Kwezi Shaft mines the UG2 reef reserve within the mining lease limits as described under the mining rights NW 30/5/1/2/2/80 MR. Kwezi Shaft is on its production decline phase with the expected life of mine of until 2027. Due to the depressed Platinum Group Metals (PGMs) global market and the declining production profile at Kwezi Shaft there is urgent need to find additional ounces to maintain a sustainable production profile.

The UG2 Shallows blocks will add much needed ounces to keep the shaft’s production profile at the sustainable levels. Timely addition of the UG2 Shallows blocks to the existing Kwezi Shaft profile is required to optimise existing critical mass before decline in early 2025. The approval of the expansion of the Kwezi shaft mining right area will extend the life of mine for the operations by an additional 4 years.

4.2 Project Desirability

4.2.1 National

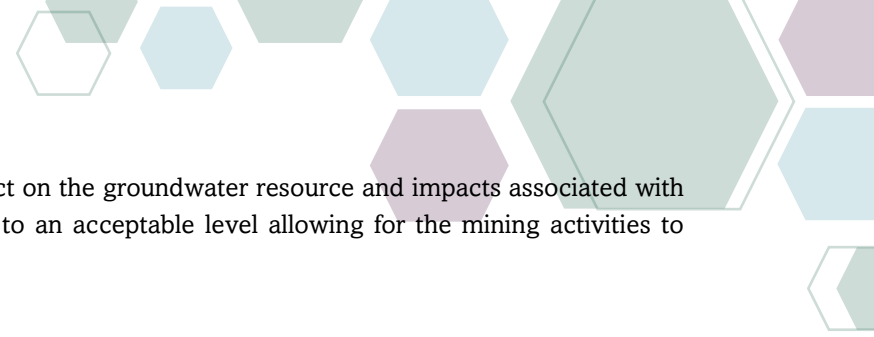
In terms of the National Development Plan (2030), Minerals underpin the economic strength of many countries. Africa holds 95 percent of the world’s reserves of platinum group metals and South Africa holds large global shares in Platinum Group Metals, gold, diamonds, manganese, coal iron ore. However, over the past decade domestic mining has not met the global growth trend in mineral exports due to the poor infrastructure. The proposed project can be seen as an extension of the SS mineral rights, ensuring continued mining activities, production and an opportunity to match global growth trends.

4.2.2 Provincial

The mining sector plays a crucial role in the North West economy. Mining contributes more than a quarter (39%) to the total provincial economy. As a result, the provincial economy is somewhat dependent on the demand for metals and minerals from foreign economies and the subsequent fluctuation in commodity prices. The mining sector has been noted as one of the economic sectors to achieve employment and economic growth due to proven potential for growth and employment creation without institutional support. SS employs more than 90 000 people making them the country’s largest employer outside of government. Should the expansion of the mining right not be realised, the revenue and jobs associated with the operations of the mine will be lost, which could potentially impact the provinces ability to meet the GVA targets.

4.2.3 Local

The mainstay of the economy of Bojanala Platinum District is mining, which generates more than half of the District’s Gross Domestic Product (GDP) with the bulk of the platinum mining activity being located in the Rustenburg Local Municipality. It is widely recognised that investment within the mining industry is important for the creation of social and economic upliftment within the district. In terms of the Rustenburg Local Municipality’s IDP 2022/2027, Rustenburg’s economy is largely concentrated in the platinum mining industries, which contributed 76.6% to provincial GVA in 2020, followed by the community services sector at 6.4 % in the same period. Mining has been identified as a Prioritised sector as a potential to encourage or drive growth and or for their ability to create employment. Thus, the proposed project is in line with priorities



on a local level. Although there will be an impact on the groundwater resource and impacts associated with blasting and vibration, these can be mitigated to an acceptable level allowing for the mining activities to continue.



PROJECT ALTERNATIVES

5. PROJECT ALTERNATIVES

In terms of the EIA Regulations published in Government Notice (“GN”) R982 of 2014, as amended, feasible and reasonable alternatives must be identified and considered within the environmental assessment process. According to the above-mentioned Regulations, an alternative is defined as “in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:

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

In terms of Section 24 of NEMA, the proponent is required to demonstrate that alternatives have been described and investigated in sufficient detail during the EA process. It is important to highlight that alternatives must be practical, feasible, reasonable and viable to cater for an unbiased approach to the project and in turn to ensure environmental protection.

Alternatives should include consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. In all cases, the no-go alternative must be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes) or both is appropriate needs to be informed by the specific circumstance of the activity and its environment.

Alternatives, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity. Generally, several alternative aspects are considered when planning a project. **Table 15** indicates several alternatives aspects that could be considered, and reasons for considering those or not as part of this assessment. These alternatives considered are explained in more detail below.

TABLE 15: ALTERNATIVES ASPECTS CONSIDERED

Alternative aspects	Reason for consideration or not
Property/location	The presence of mineral deposits governs the location of mining activities. Sibanye Rustenburg Platinum Mine (Pty) Ltd holds a Mining Right for the Kwezi Shaft operations, hence the intention is to rather expand on the existing operations than to propose mining activities on a different location. Since the proposal is for the expansion of an existing underground mine, the current infrastructure will be used, and no new infrastructure will be established on surface. There are no location alternatives due to the following reasons: • The availability of the mineral deposit • Allows for the expansion of existing underground mining areas • The availability of the already existing surface infrastructure for the processing of the mineral
Type of activity	The type of activity alternative was not considered. The Kwezi operations is currently utilising the underground mining method. The expansion (UG2 Blocks) will be accessed via the existing shaft. Opencast mining is not a viable option due to the intention to expand the underground mine area and to prevent surface disturbance.
Design or layout	Not considered, the proposed project is the expansion of the Kwezi shaft Mining Right Area for the inclusion of the additional UG2 blocks. This application does not include any associated facilities or infrastructure required for the mining operations.
Technology	Not considered, the proposed project is the expansion of the Kwezi shaft Mining Right Area for the inclusion of the additional UG2 blocks. This application does not

Alternative aspects	Reason for consideration or not
	include any associated facilities or infrastructure required for the mining operations.
Operational aspects	The operational aspect of the activity was considered in terms of the mineral waste. Further details are provided in Section 5.1.
No-go alternative	The no-go alternative was considered. Further details are provided in Section 5.2.

5.1 Operational Aspect

Alternative waste management strategies were considered for the waste rock. Refer to **Table 16**.

TABLE 16: ASSESSMENT OF ALTERNATIVE WASTE MANAGEMENT STRATEGIES FOR THE WASTE ROCK

Alternative	Advantages	Disadvantages
Backfilling	- Reduces the ground level footprint and height of the Waste Rock Dumps - Promotes stability in the mined out underground areas - Sustainable return of the rock to its origin	- Costing if not planned for in the mining method - Reactive rock may result in the potential formation of acid mine drainage
Disposal on Waste Rock Dumps	Well known proven solution	- Potential impact on the ambient air quality - Visual intrusion due to the height of the Waste Rock Dumps - Surface disturbance depending on the ground level footprint - Final disposal is least desirable - End use rehabilitation including the shaping and vegetation of the side slopes - Possible leachate formation, which could impact the water resources

5.2 No-go Alternative

In addition to the large chromium and PGM reserves in South Africa, and in particular, the Bushveld Igneous Complex which has the potential to harness economic growth and beneficiation for not only the North-West Province but for South Africa, the proposed expansion of the mining right area has numerous advantages as outlined below. Should the proposed activities not proceed, the benefits of such will not be realised.

- The employment of local individuals as full-time employees when the mine is fully operational. Sibanye Stillwater Rustenburg Platinum Mines has an approved Social and Labour Plan in place which outlines the Company's local economic development programmes. Sibanye-Stillwater employs more than 90 000 people making them the country's largest employer outside of government.
- Contributions to the SA Economy. Cumulatively over the last 10 years, SS have paid a total of R44 billion in taxes, representing a substantial contribution to the fiscus in jurisdictions where SS conduct business.
- The addition of the UG2 blocks will maintain a sustainable production profile for the shaft until life of mine is reached in 2027.

The additional UG2 reserve blocks are situated underneath an industrial area and informal settlements, making the option for open pit mining not viable. Not approving the additional extraction, will prevent the overall extraction of these minerals mined from the ground.



PUBLIC PARTICIPATION PROCESS

6. PUBLIC PARTICIPATION PROCESS

The NEMA (1998) EIA Regulations, 2014, as amended, prescribe that the Basic Assessment process must include the undertaking of public participation in accordance with the Chapter 6 of the Regulations. The purpose of the Public Participation Process (“PPP/P3”) is to provide all potential and / or registered Interested and Affected Parties (“I&APs”), including the competent authority and any other stakeholder or organ of state, an opportunity to become involved in the Basic Assessment process and provide comments during the various phases of the project. Involvement by I&APs is critical, as it contributes to a better understanding of the proposed project among I&APs, raises important issues that need to be assessed and provides local insight that will enhance the Basic Assessment process. This Section of the report provides details on the PPP followed during the BA for the proposed project.

Table 17 described the public participation process followed.

TABLE 17: PUBLIC PARTICIPATION PROCESS FOLLOWED

Activity	Description
Pre-Application phase	
Identification of stakeholders	I&APs were identified and notified through various means of online tools such as emails. Other activities that form part of the initial public participation phase include the placement of Site Notices, distribution of BID’s electronically via email and engagement with adjacent The following stakeholders were identified. • North-West Department of Mineral and Petroleum Resources (DMPR) previously known as 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 • Rustenburg Local Municipality • South African National Roads Agency (SANRAL) • Landowners of associated properties and ervens Refer to Appendix D1 for the stakeholder database.
Pre-Application meeting	A pre-application meeting was held with the competent authority for the EA, the North West DMPR on 31 May 2024. During this meeting the proposed project was presented and the competent authority was provided with an opportunity to raise any concerns, comments and queries. Minutes of the Pre-Application meeting can be found in Appendix D2 .
Site notices	Site notices were placed on site and within areas in close proximity to the proposed site. Site notices were placed on the 3 rd September and 12 September 2024. Refer to Appendix D3 for a proof of site notices placed.
Background Information Letter	A Background Information Document’s (“BID”) was compiled and distributed electronically via email to the competent authority, commenting authorities, adjacent landowners and all identified stakeholders. The Hard copy of the BID was distributed on 3 and 12 September 2024. Refer to Appendix D4 for a copy of the BID and Appendix D5 for proof of emails sent. Appendix D6 provides copies of the knock and drop registers.
Notification Letter	A notification letter was distributed to inform stakeholders about the proposed extension. A copy of the notification letter is available in Appendix D7 . Proof of distribution is available in Appendix D5 .

Registered mail	Registered mail was sent out to landowners where contact details could not be obtained. Proof of registered mail is included as Appendix D8 .
Focus Group Meeting	A Focus Group Meeting was held on the 7 October 2024 with South African Breweries. Refer to Appendix D9 for the minutes of the meeting. A Focus group meeting was held on the 6 of November 2024, with the landowners that provided comments. Refer to Appendix D10 for the attendance register and minutes of the meeting. Once the Draft Basic Assessment Report was made available, the following focus group meetings were held: • Meeting with Eurosales on the 4 December 2024 and 12 December 2024 • Meeting with Epol/Rainbow on the 12 December 2024. The minutes of the meetings have been included in Appendix D14.
Comments and Response Report	All comments obtained from stakeholders during the pre-application, announcement phase and Draft Basic Assessment phase has been captured in the Comments and Response Report. Refer to Appendix D11 for the comments and Response Report. The comments received is provided in Appendix D12 .
Basic Assessment Phase	
Newspaper Advertisement	A newspaper advertisement was placed in the Rustenburg Herald newspaper on the 13 November 2024 edition announcing the availability of the Draft BAR for public comment. The advertisement is provided in Appendix D13 .
Availability of the draft BAR	The Draft BAR was available for public comment for a period of 30 days from 14 November until 13 December 2024. The availability of the report for comment was advertised in the Platinum Rustenburg Herald newspaper on 13 November 2024 edition. The report was available at the following public places: • Rustenburg Local Library • Kwezi Shaft Security Offices • Alta van Dyk Environmental Consultants Office The Draft BAR was also available electronically on the AVDE website: https://www.altavandykenvironmental.co.za/public-documents/ In addition, the Draft BAR was available on the data free app ULWAZI: https://ulwazi.datafree.co. Comments received during the comment period of the Draft BAR have included in the Comment and Response Report ("CRR") and submitted with the Final BAR to the DMPR for decision making. The comments and response report is provided in Appendix D11.
Final Basic Assessment Report	All comments obtained from stakeholders during the pre-application, announcement and Draft BAR comment periods, have been captured and addressed in the CRR.
Decision making phase	
Notification letter	Once a decision regarding the environmental authorisation has been received from DMPR, all registered stakeholders will be informed with a notification letter via email and SMS.

6.1 Legal requirements for public participation

Table 18 provides a review of the legal requirements for public participation in terms of the NEMA EIA Regulations.

TABLE 18: LEGAL REQUIREMENTS FOR PUBLIC PARTICIPATION

NEMA Regulation	Public Participation Regulation	Process followed
39 (1)	If the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.	The proponent is not the land owner; all land owners were informed of the proposed project via email notifications. Refer to Appendix D5 and D8 .
40(1)	The public participation process to which the- (a) basic assessment report and EMP, 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, EMP, 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, EMP, 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 was available for public comment for a period of 30 days from 14 November until 13 December 2024.
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 relates; and (d) all potential, or, where relevant, registered interested and affected parties.	The following state departments were informed of the proposed project and provided with an opportunity to comment on the Draft BAR: • DMPR (competent authority) • DWS • SAHRA • Provincial Heritage Resources Agency-NW • North West Department of Economic Development, Environment, Conservation and Tourism • North West Department of Agriculture and Rural Development • Rustenburg Local Municipality • Bojanala District Municipality Refer to Appendix D5 for emails sent.
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 be provided with an opportunity to comment on such reports once an application has been submitted to the competent authority	The Draft BAR was available for public comment for a period of 30 days from 14 November until 13 December 2024.
41(2)	The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested	A2 notice boards were placed at the proposed project site as part of the project announcement. Refer to

NEMA Regulation	Public Participation Regulation	Process followed
	and affected parties of an application or proposed application which is subjected to public participation by- (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;	Appendix D3 proof of site notices placed.
41(2)	giving writing notice, in any of the manners provided for in Section 47D of the Act, to-	
	the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;	A Background Information Document's ("BID") was compiled and distributed electronically via email to the competent authority, commenting authorities, adjacent landowners and all identified stakeholders. The Hard copy of the BID was distributed on 3 and 12 September 2024. Refer to Appendix D4 for a copy of the BID and Appendix D5 for proof of emails sent. Appendix D6 provides copies of the knock and drop registers.
	owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;	
	the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;	A BID was emailed to Cllr Phillemon (Ward11) Refer to Appendix D5 for emails sent.
	the municipality which has jurisdiction in the area;	A BID was emailed to the following departments within the local municipality: Environmental Division Development and Planning Planning & Human Settlement Refer to Appendix D5 .
	any organ of state having jurisdiction in respect of any aspect of the activity	BIDs were distributed via email to the following authorities: DMPR DWS SAHRA Provincial Heritage Resources Agency-NW North West Department of Economic Development, Environment, Conservation and Tourism North West Department of Agriculture and Rural Development Rustenburg Local Municipality Bojanala District Municipality Refer to Appendix D5 .
	any other party as required by the competent authority;	None required to date
41(2)	placing an advertisement in- one local newspaper; or	A newspaper advertisement was placed in the in the Rustenburg Herald newspaper on the 13 November 2024

NEMA Regulation	Public Participation Regulation	Process followed
	any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;	edition announcing the availability of the Draft BAR for public comment. The advertisement is provided in Appendix D12 .
41(2)	(b) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and	Not applicable. The activity does not have an impact that extends beyond the boundaries of the metropolitan.
41(2)	(c) 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 referred to in subregulation (2) must- (a) give details of the application or proposed application which is subjected to public participation; and (b) state- (i) whether 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 or proposed application can be obtained; and (iv) 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 at the proposed project site as part of the project announcement. Refer to Appendix D3 proof of site notices placed.
41(4)	A notice board referred to in subregulation (2) must- (a) be of a size of at least 60 cm by 42 cm; and (b) display the required information in lettering and in a format as may be determined by the competent authority.	



ENVIRONMENTAL STATUS QUO (BASELINE)

7. ENVIRONMENTAL STATUS QUO (BASELINE)

7.1 Topography

The North West Province has a very unique and uniform terrain with altitudes ranging from between 930 – 1782m above mean sea level. The central and western regions are characterised by flat or gently undulating plains whereas the eastern region is of a more variable topography. The Magaliesberg mountain range has its origin in the eastern part of the province within the Transvaal Sequences Magaliesberg formation.

The valleys of streams in the area are mainly broad, open and exhibit rather low gradients. The catchment area is drained by the northward flowing Crocodile River and its tributaries. The Kwezi Shaft is situated in the north-eastern side of the town of Rustenburg. The Kwezi Shaft is situated in a homogeneous topography with a mean altitude of between 1120 and 1144 mamsl. Refer to **Figure 12** for an illustration of the topography.

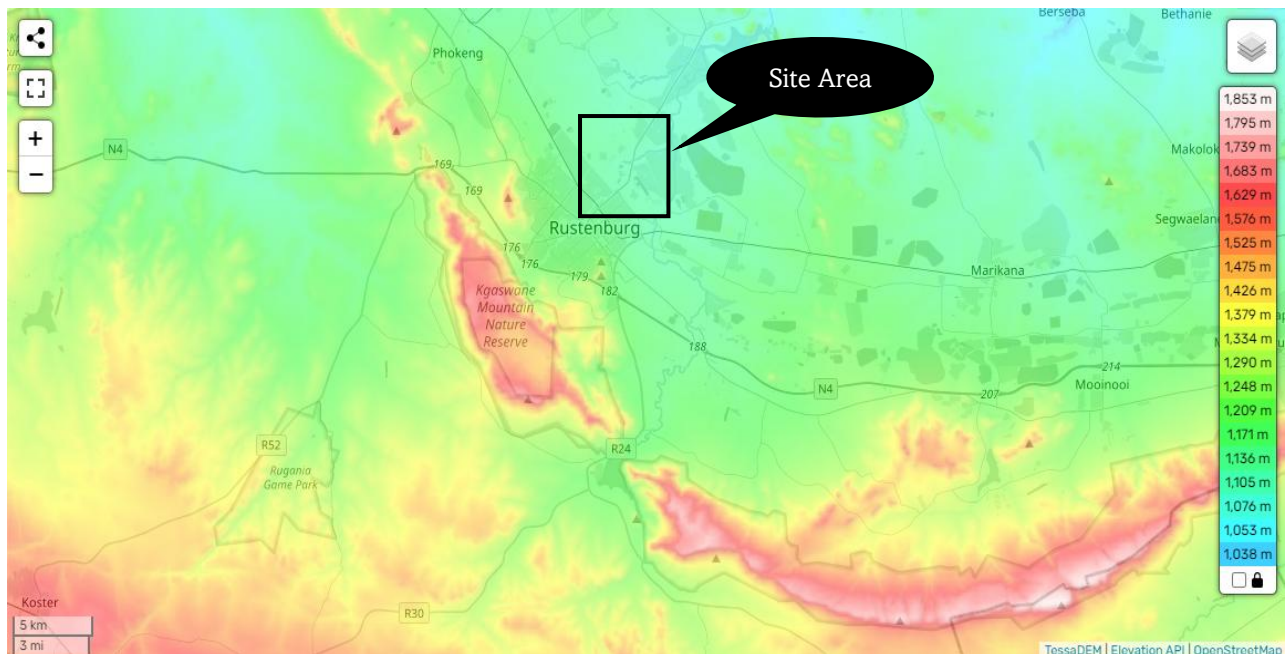


FIGURE 12 TOPOGRAPHY OF SITE AREA (TOPOGRAPHIC-MAP, 2024)

7.2 Climatology

7.2.1 Temperature

In Rustenburg the summers are generally described as being warm and long with mostly clear skies with temperatures ranging between 13°C and 29°C. In the opposite, the winter is considered to be very cold and shorth with temperatures ranging between -1°C - 33°C.

7.2.2 Precipitation

The proposed project falls within the summer rainfall region of South Africa, with 80% of the annual rainfall occurring during the months of September to April. 50% of the rainfall falls during summer with significant number of thunderstorms. These occur as conventional thunderstorms and are usually scattered and of short duration and high intensity. The rainfall events are highly localised and can vary markedly over short distances.

Figure 13 below depicts the annual rainfall pattern for the Rustenburg area.

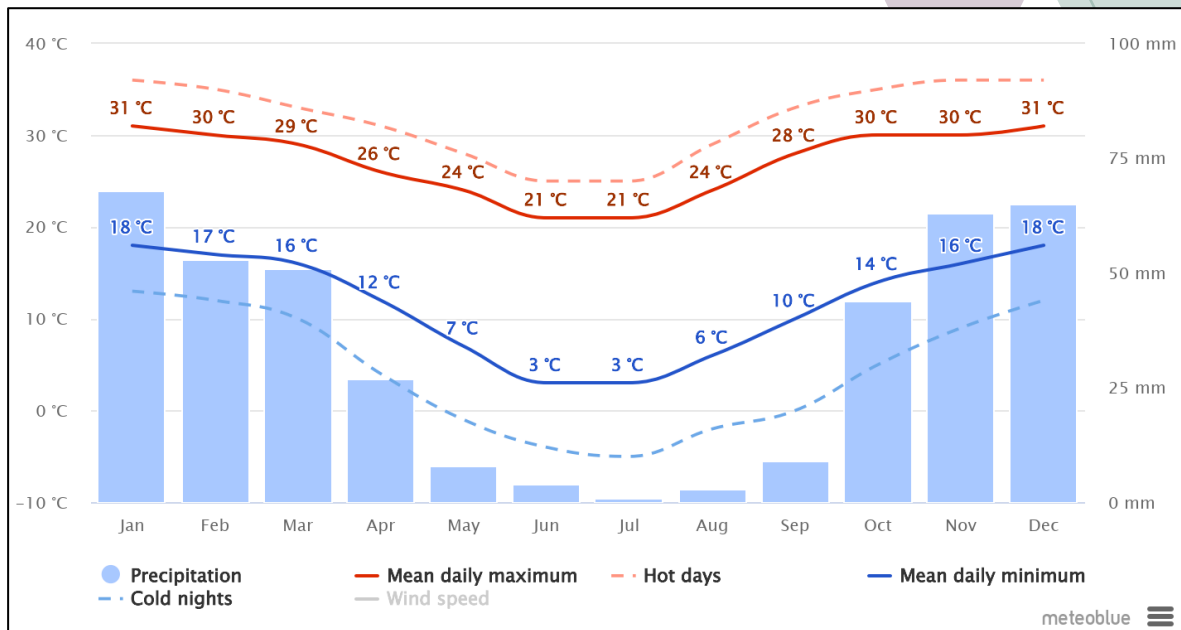


FIGURE 13 AVERAGE TEMPRETURE AND PRECIPITATION FOR RUSTENBURG AREA (METAOBLUE, 2024)

7.2.3 Wind Direction

The annual prevailing wind direction changes throughout the year. With the most often wind direction occurring from the east-north-easterly direction, the north-westerly and the south-south-easterly directions. The figure below depicts the annual wind rose for the Rustenburg region. The compass-like configuration of the wind rose shows the direction the wind is blowing from, not towards. The colour of each spoke indicates the range of wind speeds for that direction. The legend at the bottom of the wind rose explains the colour scheme

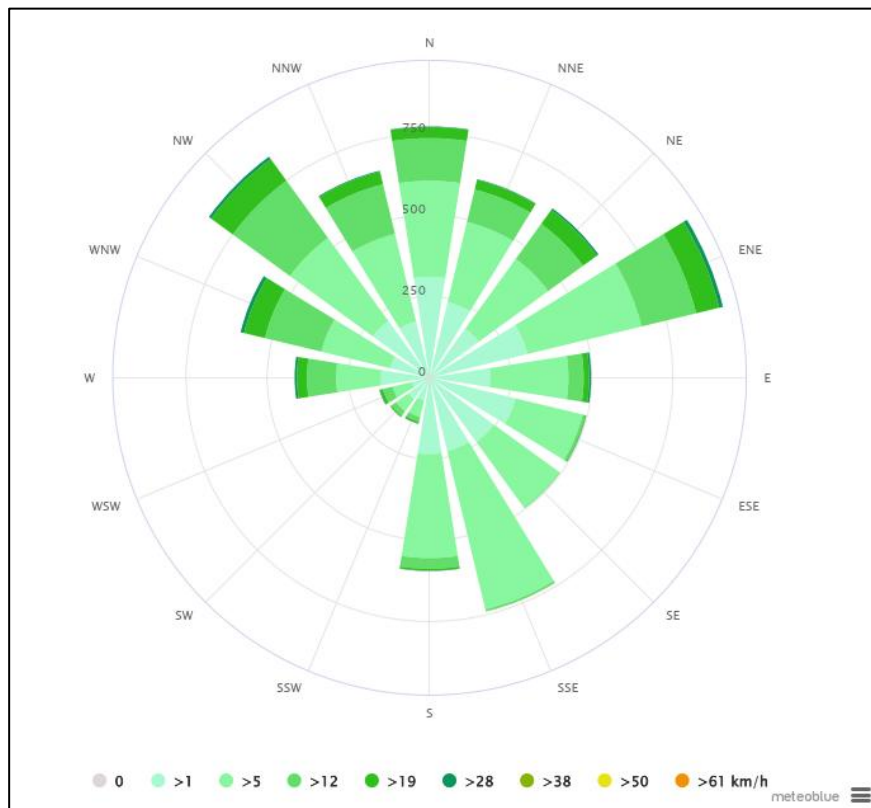


FIGURE 14 ANNUAL WIND ROSE FOR RUSTENBURG AREA (METAOBLUE, 2024)

7.3 Geology

The geology of the region is dominated by the layered rocks of the Bushveld Igneous Complex (BIC) as shown in **Figure 15**. The BIC extends approximately 350 km in an east-west direction and covers an area of approximately 66, 000 km². The Rustenburg area overlies part of the ultramafic to mafic layered sequence – the so-called Rustenburg Layered Suite. The Rustenburg layered suite, consists stratigraphically of the following (**Figure 16**).

- Marginal Zone (norite).
- Lower Zone (norite).
- Critical Zone (pyroxenite, norite, anorthosite and chromitite). The Critical Zone also contains the Platinum Group Metal (PGM) bearing Merensky Reef and UG2 chromitite reefs which form the focus of the mining activities.
- Main Zone (gabbro-norite).
- Upper Zone (magnetite-gabbro)

The Critical Zone is subdivided into Lower, Middle and Upper Groups which contain thirteen major Chromitite seams (GSA, 2006). The lower group with seven seams (LG1-7), the middle group with five seams (MG1-5) and the Upper Group with three seams (UG1-3). Of particular importance is the UG2 chromitite layers within the upper Critical Zone, which is the target of the mining operations. The Critical Zone is overlain by the Main zone, a uniform sequence of cumulates consisting mostly of norite and gabbro-norite. Overlaying the Main Zone is the Upper Zone, which consists of gabbro and anorthosite overlain by progressively more differentiated rock such as diorite.

In the study area the Merensky and UG2 reefs strike northwest by south-east and dip between approximately 10° and 14° to the northeast. Mining from the Merensky Reef started approximately 95 years ago from surface on sub-outcrop using on-reef declines. As mining depths increased, reef access was gained by progressively deeper vertical shafts. At present, the Merensky Reef has been mined along more than 28 km of strike and mining depths exceed 1 200 metres below surface (mbs). Opencast and underground mining of the UG2 Reef, situated 100-140 m below the Merensky Reef, started some 15 years ago. Access is mostly gained from vertical and decline shafts from the Merensky Reef operations.

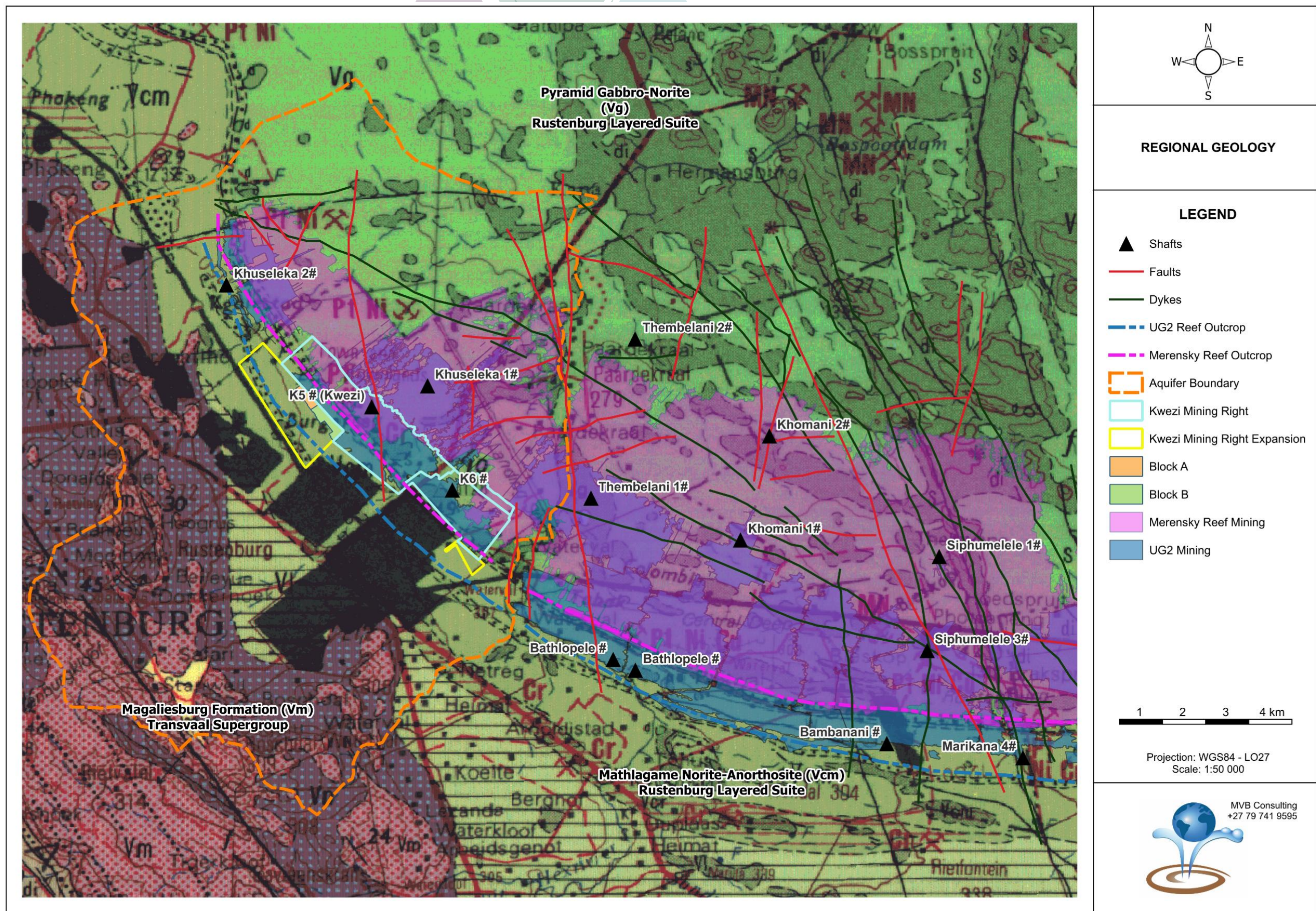


FIGURE 15 REGIONAL SURFACE GEOLOGY

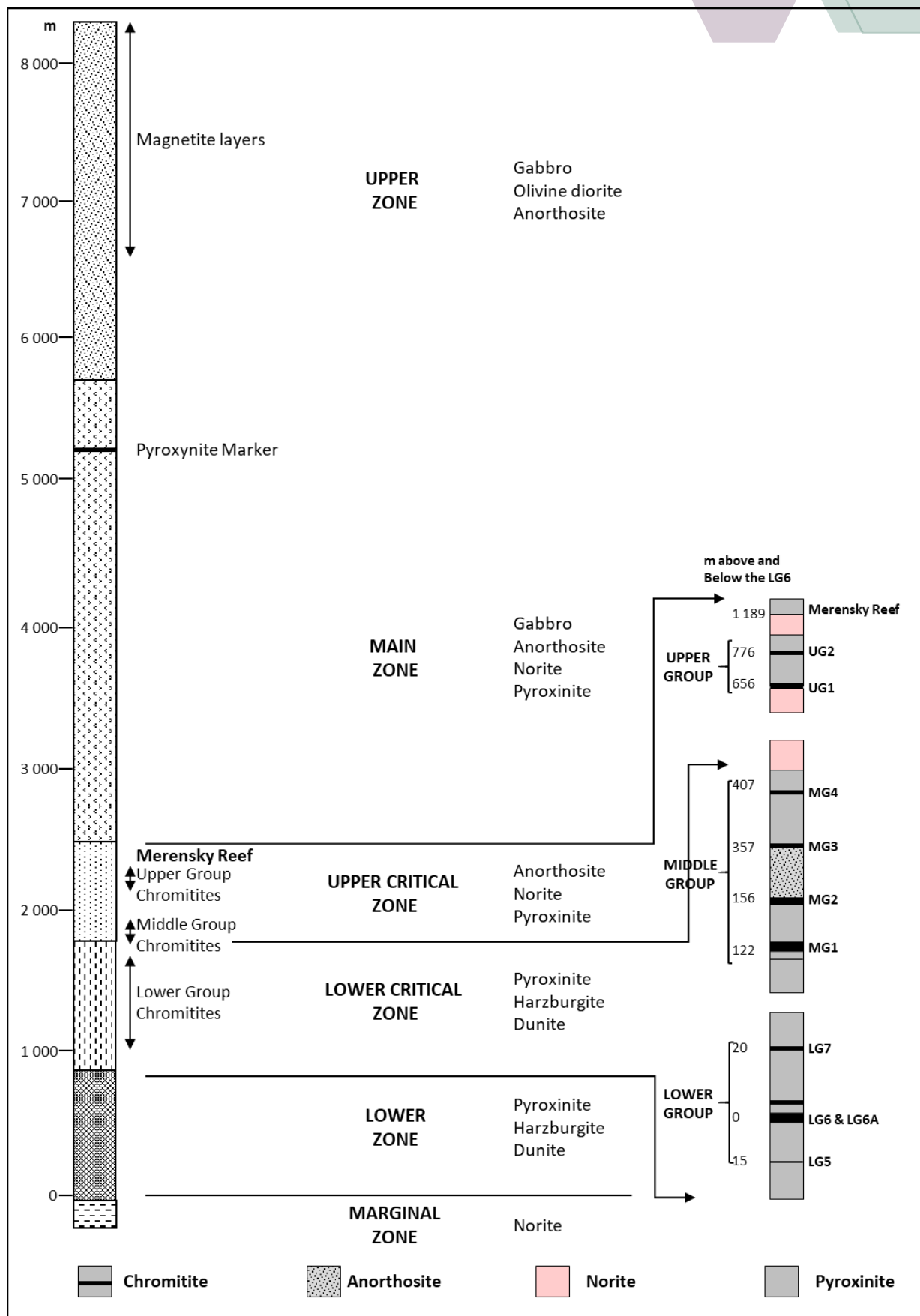


FIGURE 16: GENERALISED STRATIGRAPHIC COLUMN OF THE RUSTENBURG LAYERED SUITE OF THE BUSHVELD COMPLEX (VILJOEN & SCHURMANN, 1998) (MVB CONSULTING, 2024)

7.4 Biodiversity

7.4.1 Vegetation

The Kwezi Shaft Area including the expansion areas is associated with the Marikana Thornveld (MT) Vegetation Type.

The MT 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. Marikana Thornveld occurs on plains from the Rustenburg area in the west, through Marikana and Brits to the Pretoria area in the East.

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.

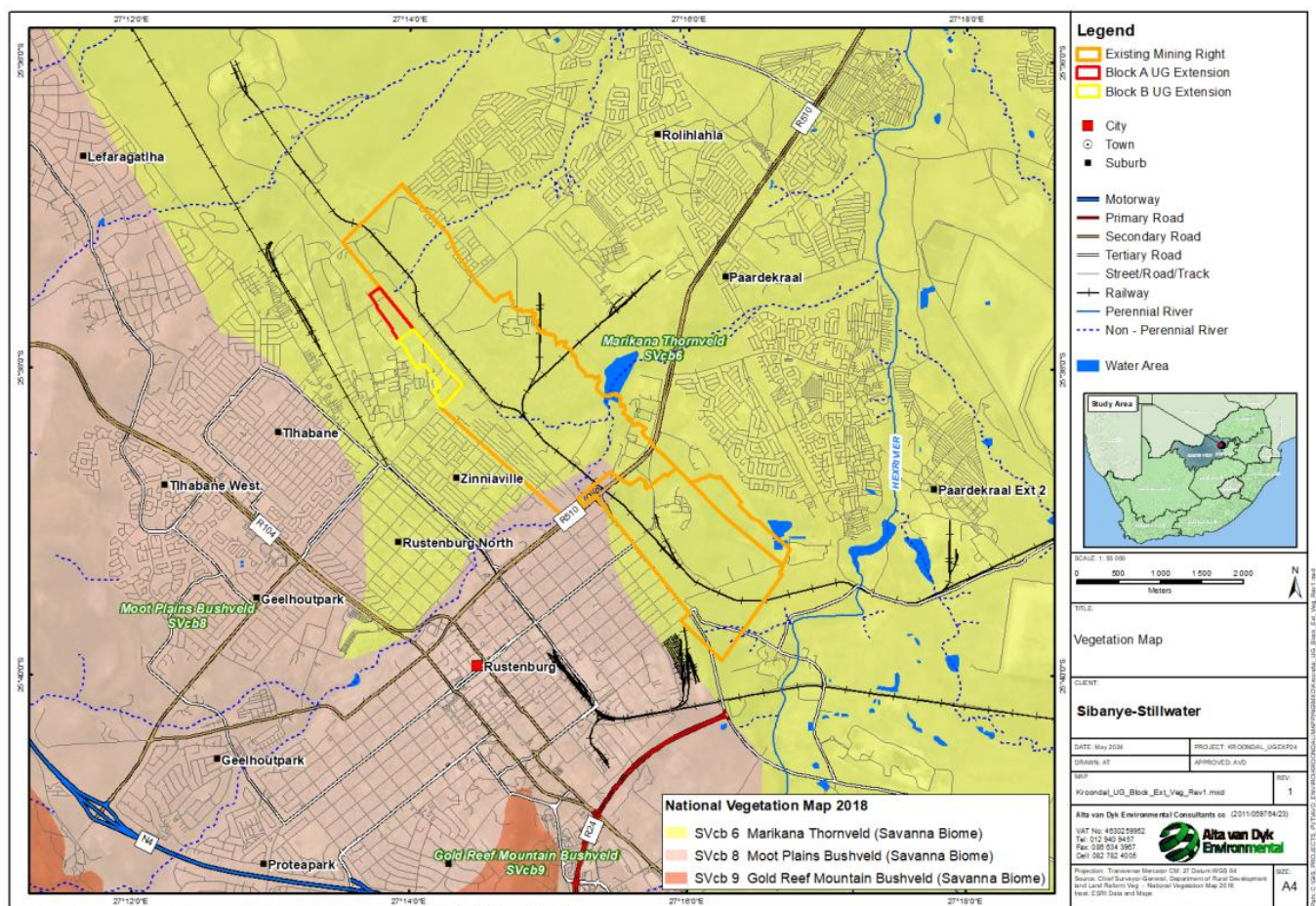
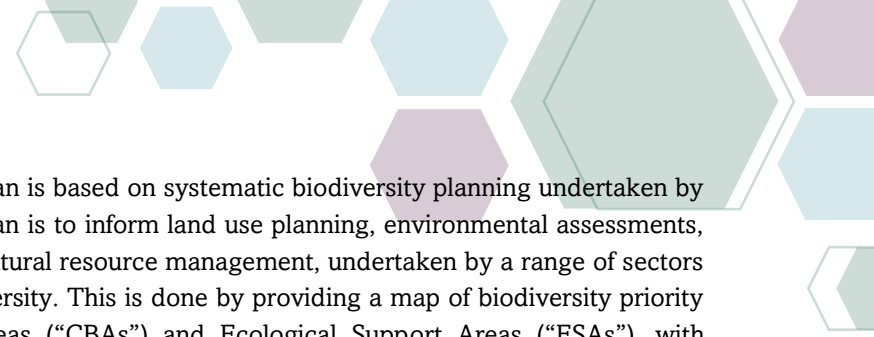


FIGURE 17: VEGETATION MAP OF THE STUDY AREA

In terms of the Terrestrial Ecosystem Threat Status, the study area falls within an ecosystem which is listed as Endangered (EN) (Marikana Thornveld)

7.4.2 North West Biodiversity Sector Plan

The North-West Department of Rural, Environment, and Agricultural Development ("READ"), as custodian of the environment in the North-West, is the primary implementing agent of the Biodiversity Sector Plan. The



spatial component of the Biodiversity Sector Plan is based on systematic biodiversity planning undertaken by READ. The purpose of a Biodiversity Sector Plan is to inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management, undertaken by a range of sectors whose policies and decisions impact on biodiversity. This is done by providing a map of biodiversity priority areas, referred to as Critical Biodiversity Areas (“CBAs”) and Ecological Support Areas (“ESAs”), with accompanying land use planning and decision-making guidelines.

CBAs are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems as well as the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met.

ESAs are terrestrial and aquatic areas that are not essential for meeting biodiversity representation targets (thresholds), but which play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree or extent of restriction on land use and resource use in these areas may be lower than that recommended for CBAs.

In terms of the North West Biodiversity Sector Plan the proposed site area is not located within CBA or ESA areas. Refer to **Figure 18**.

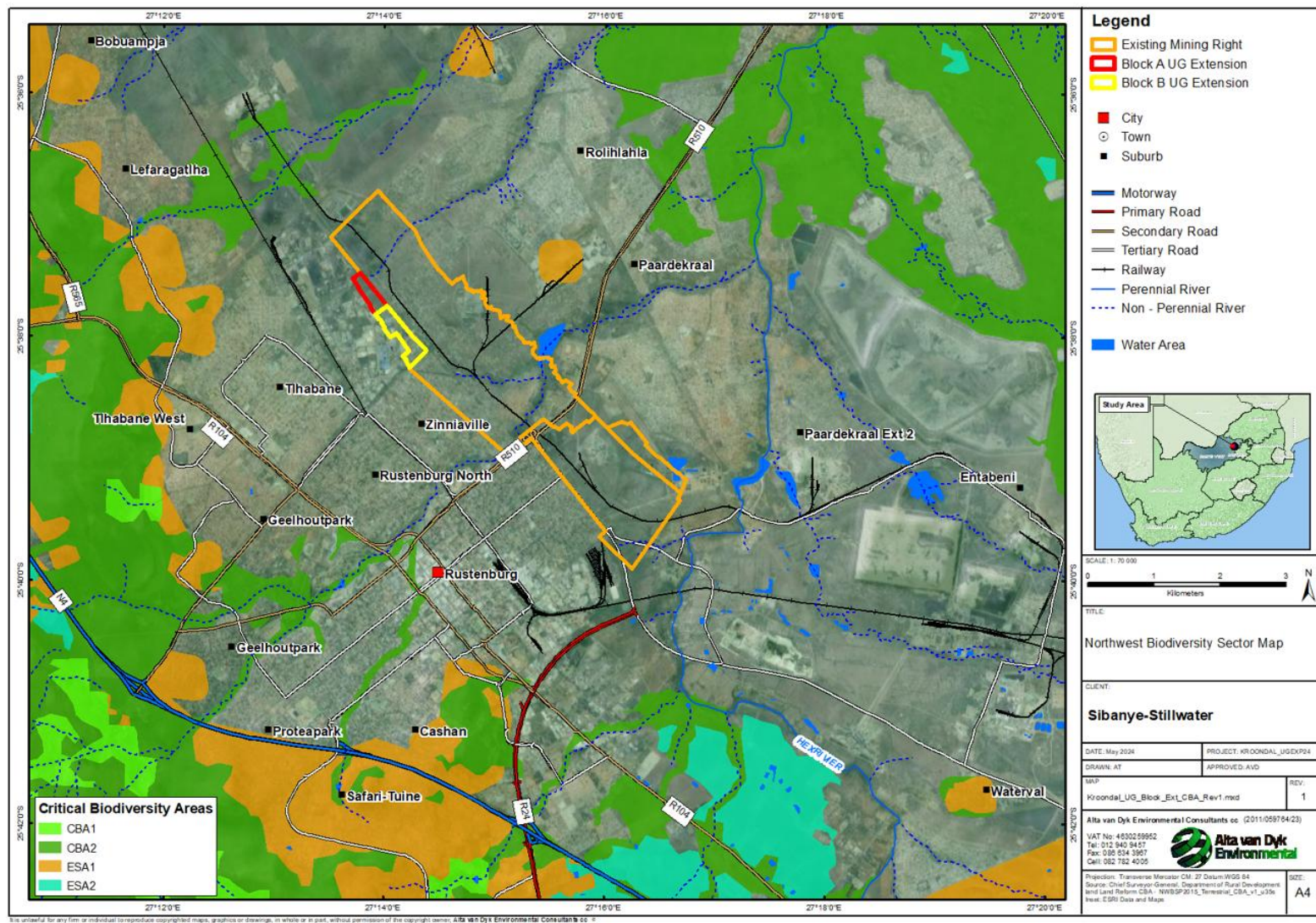


FIGURE 18 NORTH-WEST BIODIVERSITY SECTOR PLAN OF THE SITE AREA

7.4.3 Flora

Note: Information from this section was obtained from the Consolidated Pooling and Sharing Agreement Environmental Management Programme Report (WSP, 2016) and Golder Associates Africa (Golder). 2021. Final Rehabilitation, Decommissioning and Mine Closure Plan for the PSA Platinum Mining Operations, as at December 2020.

The Kwezi Shaft falls within the threatened Marikana thornveld which is part of the Savanna biome. The vegetation is dominated by various Acacia species, including the Scented Thorn (*Acacia nilotica*), the Sweet Thorn (*Acacia karroo*). Other woody species often encountered include the Buffalo Thorn (*Ziziphus mucronata*), Sicklebush (*Dichrostachys cinerea*) and Wild Raisin (*Grewia flava*).

Dominant grass species include Turf Grass (*Ischaemum afrum*), Deck Grass (*Sehima galpinii*), Vlei Bristle Grass (*Setaria incrassata*) and White Buffalo Grass (*Panicum coloratum*). Overgrazing causes an increase in woody species, with an associated dominance of Pinhole Grass (*Bothriochloa insculpta*), Three-awn Rolling Grass (*Aristida bipartite*), Sweet Signal Grass (*Brachiaria eruciformis*) and Black-seed Wild Sorghum (*Sorghum versicolor*).

The disturbed nature of the site is illustrated by grass species such as Couch grass (*Cynodon dactylon*), Natal Red Top (*Melinis repens*), Spear Grass (*Heteropogon contortus*), Common Thatching Grass (*Hyparrhenia hirta*) and Tumble Weed (*Panicum volutans*), which favour disturbed areas such as uncultivated lands and roadsides. Grass species such as Natal Red Top, Tumble Weed and Pinhole Grass have a low grazing value and their ecological status classifies them as Increaser IIc grass species. This means that they increase with severe overgrazing. Common Thatching Grass is dominant on this site and has an average grazing value. It is a species that usually dominates in poor veld and increases with understocking or selective grazing. Rooigras (*Themeda triandra*) and Black-seed Bristle Grass (*Setaria nigrirostris*) have a high grazing value and are indicative of veld in good condition. These two grass species are not dominant on this site.

Alien vegetation species such as the Sweet prickly pear (*Opuntia ficus-indica*), Syringa (*Melia azedarach*), American Agave (*Agave Americana*), Thorn Apple (*Datura stramonium*) Tipu Tree (*Tipuana tipu*), Black Jacks (*Bidens pilosa*), Wild Verbena (*Verbena bonariensis*) and Khaki Weed (*Tagetes minuta*) occur on site.

7.4.1 Fauna

The fauna in the area appears to have been impacted on by the mining activities, as well as the continual heavy vehicle movement, in the surrounding area. However, the prime impact on the fauna in the area is attributed to the abundance of squatters living in the surrounding area. Although no snares were found during the field surveys, poaching should not be ruled out as a limitation to the fauna in the area.

Avifauna

A total of 22 bird species were recorded during the project survey. Three species are associated with aquatic habitats. These include the Egyptian Goose, Blacksmith Plover and Common waxbill. Five species are associated with thornveld habitat. These include the Cardinal woodpecker, Crimson boubou, Glossy starling, Redbilled quelea and the Blue waxbill. Seven species are associated with grassland and bushveld habitats. These include the Crowned Plover, Forktailed Drongo, Chinspot Batis, Spotted dikkop, Helmeted guineafowl, Yellowbilled hornbill and Stonechat. The Crowned Plover particularly favours recently burnt grassland areas. Bird species such as the Hadedra, Blackshouldered kite, Doves, Blackcrowned Tchagra and Fiscal Shrike are all common in rural suburbia and/or plantations.

Mammals

Six Red Data Species are included in the project mammal survey list. These are the Short-eared Trident Bat *Cloeotis percivali*, the Least Dwarf Shrew *Suncus infinitesimus chriseos*, the Honey Badger *Mellivora capensis*, the Antbear *Orycteropus afer*, Southern African Hedgehog *Atelerix frontalis* and the Pangolin *Manis temminckii*. No mammal species were observed.

7.5 Soils and Land Use

The proposed MR expansion project is situated on Arcadia (Vertic A Horizon/ Unspecified) and Hutton (Orthic-A – Horizon/Apedalic B-Horizon) soil forms with an average dept of 1200mm. These soil forms are perfect forms to be stripped and stored for re-use or rehabilitation after the mining activities have concluded.

The soils surrounding the Kwezi, ventilation shafts are also mostly black turf clays of the Arcadia form, characteristically developed as a residual soil over gabbro-norite rocks. The soils are natively fertile and can be high yielding if correct irrigation practices are employed (WSP, 2016; Golder 2020).

Soil Analysis shown the following characteristics as identified in soil sampling (Golder, 2020).

TABLE 19: SOIL CHARACTERISTICS (GOLDER, 2020)

Soil Characteristic	Description
pH levels	Ranges between 6.9 and 7.5
Electrical Conductivity	31 and 98 mS/m
Sodium	Levels are low indicating zero risk to erosion due to dispersion of clay particles by sodium ions.
Nitrogen	Fairly low – must be supplemented when used during rehabilitation.
Phosphorus	Fairly low – must be supplemented when used during rehabilitation.
Potassium	Concentrations are sufficient when soil is re-used in rehabilitation. Should sustain normal plant growth but must be re-analysed Stockpiled topsoil used in rehabilitation should be analysed prior to establishment of vegetation and ameliorated to address any chemical deficiencies that may occur
Calcium	Concentrations are sufficient when soil is re-used in rehabilitation. Should sustain normal plant growth but must be re-analysed Stockpiled topsoil used in rehabilitation should be analysed prior to establishment of vegetation and ameliorated to address any chemical deficiencies that may occur
Magnesium	Concentrations are sufficient when soil is re-used in rehabilitation. Should sustain normal plant growth but must be re-analysed Stockpiled topsoil used in rehabilitation should be analysed prior to establishment of vegetation and ameliorated to address any chemical deficiencies that may occur

7.6 Surface Water

Kwezi Shaft is located in the Crocodile West-Marico Water Management Area (WMA) in the greater Limpopo drainage region (DWA Region A). The mining operations are situated in the Hex River and Sterkstroom catchments within the upper reaches of the Crocodile River catchment.

The Hex River, quaternary catchment A22H, is the main regional arterial drainage for the Kroondal Mine mining rights area and the greater Rustenburg area and flows in a northerly direction into the Bospoort Dam. The water from the Bospoort Dam reports to the Vaalkop Dam and then the Crocodile River.

The Dorpspruit subcatchment is potentially affected by the operations of Kwezi Shaft. The Dorpspruit has its headwaters in the Magaliesberg mountain range, in the region lying west of the Town of Rustenburg (roughly, the Rustenburg Kloof area). It flows through Rustenburg residential areas such as Geelhoutpark and Proteapark, enters the Rustenburg Golf and Country Club, passes the residential areas of Rustenburg North, Zinniaville and Oosteinde, confluences with the Industrial stream and flows into the Prison Dam. From here it flows another three kilometers through residential areas on the Farm Paardekraal and Town of Townlands before it confluences with the Hex River approximately five kilometers before Bospoort dam. Refer to **Figure 19**.

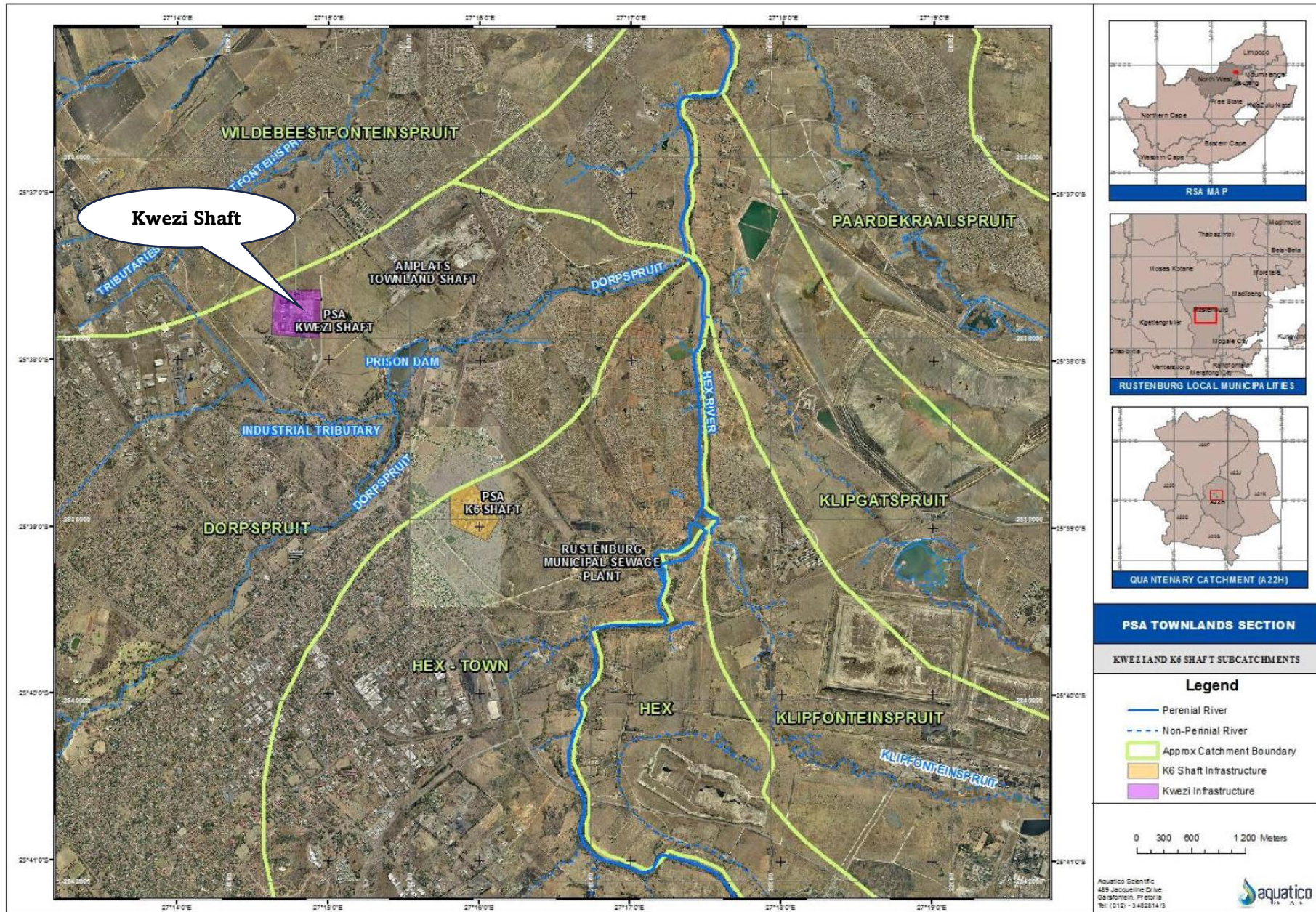


FIGURE 19 SUBCATCHMENTS IN THE HEX RIVER A22H CATCHMENT (AQUATICO)

7.7 Wetland

Note: Information for this section was obtained from Scientific Aquatic Services' (SAS) Freshwater Assessment (2024). Refer to **Appendix C2** for the full report.

7.7.1 Freshwater Ecosystem Characterisation

No natural occurring freshwater ecosystems, as per the NWA was noted within the study area. A Channelled Valley Bottom (CVB) wetland was however identified within the north eastern portion of the investigation area.

The CVB wetland within the north eastern portion of the investigation area was classified according to the Classification System (Ollis *et al.*, 2013) as an Inland System within the Central Bushveld Group 2 WetVeg (wetland vegetation) group, classified by Mbona *et al.* (2015) as "Vulnerable". At Levels 3 (Landscape Unit) and 4 (Hydrogeomorphic (HGM) Type) of the Classification System, the CVB wetland was classified as per the summary in **Table 20**.

TABLE 20: CHARACTERISATION AT LEVELS 3 AND 4 OF THE CLASSIFICATION SYSTEM (OLLIS ET AL., 2013) OF THE CVB WETLAND ASSOCIATED WITH INVESTIGATION AREA (SAS, 2024)

Freshwater Ecosystem	Level 3: Landscape unit	Level 4: HGM Type
Channelled Valley Bottom wetland	Valley floor: The base of a valley, situated between two distinct valley side-slopes.	Channelled valley bottom: A valley bottom wetland with a river channel running through it.

7.7.2 Anthropogenically derived artificial features

Four (4) artificial features were identified within the study and associated investigation areas.

According to Ollis *et al.*, (2013) an artificially created system is defined as a feature that is "produced by humans, not naturally occurring". Ollis *et al.*, (2013) further elaborates "artificial features are aquatic ecosystems where hydric soil features have developed, or where wetland plants have colonised, in historically non-wetland areas due to human activities". In addition to the identified freshwater ecosystems, anthropogenically derived features in which water ponds, were also noted within the study area and associated investigation area. The artificial feature (artificial channel) identified within Block A drains into the CVB wetland identified within the north eastern portion of the investigation area. Another artificial feature (artificial channel) was identified within the southern portion of the investigation area which also drains into a CVB wetland (also known as the Dorpspruit Stream), further east.

These features have formed due to land-use changes prompting increased runoff and ponding, as well as historic excavation activities which have altered the natural topography, thus allowing water to collect. As these features are of an artificial origin and anthropogenically derived they were not further assessed, however these were included for mapping purposes to indicate locality within the landscape. **Figure 20** presents photographs of the artificial features in relation to the natural CVB wetland.



FIGURE 20 REPRESENTATIVE PHOTOGRAPHS OF THE ARTIFICIAL FEATURE (TOP) WHICH DRAIN INTO THE NORTH EASTERN CVB WETLAND (BOTTOM). THE ARTIFICIAL FEATURE HAS BEEN CHANNELISED BY MEANS OF CONCRETE EMBANKMENTS (SAS, 2024)

7.7.3 Freshwater Ecosystem Classification

It was confirmed during the site assessment that various land transformation had occurred within the project area and immediate surrounds over time with the most significant impact from the expansion of the urban area. As a result, changes to the topography, soil and vegetation profiles were evident. Thus, where necessary, delineations were refined and augmented with the use of digital satellite imagery, historical aerial imagery and 5 meter (m) contours to improve the accuracy of the delineations, where necessary. The delineations as presented in the Freshwater Assessment Report are, nevertheless, deemed the best estimate of the temporary zone boundaries of the freshwater ecosystems based on site conditions present at the time of the assessment, and are considered adequate to allow for informed decision-making.

During the site assessments (February 2022 & July 2024), the following indicators were used to verify the boundaries of the freshwater ecosystems:

- Terrain units were used as the primary indicator. Despite transformation of the landscape associated with the investigation area, the terrain provided an indication of low-lying areas where water is likely to collect and/or move through the landscape;
- Vegetation was utilised in conjunction with the soil indicators associated with the freshwater ecosystems, where feasible. The distinction between obligate, facultative, and terrestrial vegetation was relatively discernible;
- Soil wetness indicator, duration and frequency of saturation in the soil profile is a diagnostic indicator since it influences the colour change in the soil. Low chroma (grey and muted colours) as well as mottles are more prominent in soil which have higher saturation frequency. Moist soil also indicates an increased hydroperiod and thus the potential presence of hydromorphic characteristics. This was utilised with the vegetation as the secondary indicator; and
- Soil morphological characteristics typically associated with freshwater ecosystem conditions, such as gleying or mottling were utilised in conjunction with saturation as the secondary indicator.

The delineated CVB wetland and artificial features are conceptually depicted in **Figure 21**.

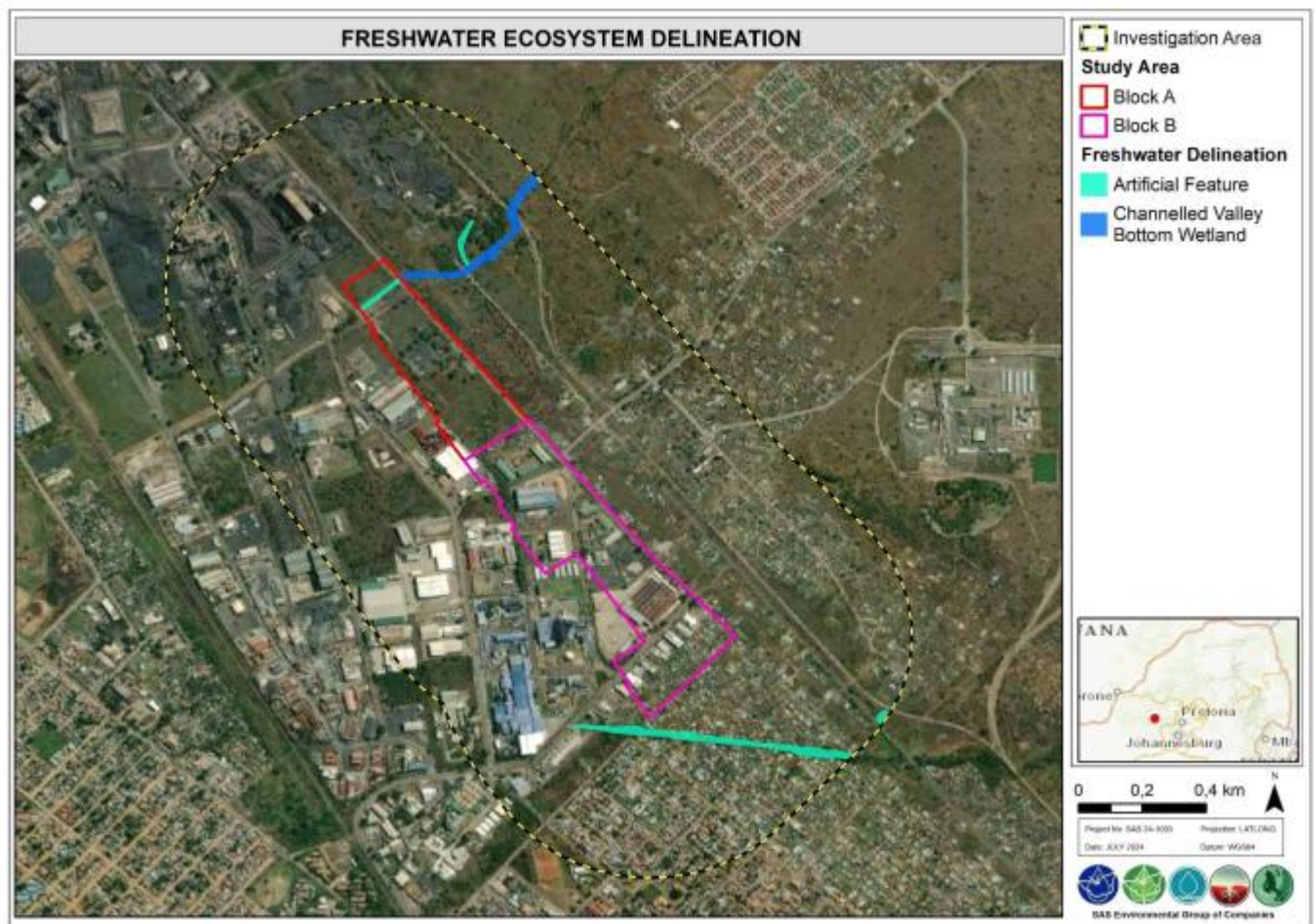


FIGURE 21: MAP DEPICTING THE DELINEATED CVB WETLAND AND ARTIFICIAL FEATURES ASSOCIATED WITH THE STUDY AND INVESTIGATION AREAS (SAS, 2024)

7.7.4 Site verification results

Present Ecological State

The Present Ecological State (PES) for the CVB was established as **Category E** (Seriously Modified). The seriously modified ecological condition of the CVB wetlands were ascribed to numerous changes to the hydraulic regimes, geomorphological processes and vegetation composition which have occurred within the wetlands as well as the catchments thereof. Impacts such as road crossings, channel straightening, prison dam, hardened surfaces, urban development, historical and current mining activities and dense alien vegetation have altered the ecological condition of the CVB wetlands.

Ecoservices Importance

The Ecoservices Importance category was established as **Very Low to Low**. The most important regulating and supporting services that the CVB wetlands provide include: stream flow regulation, sediment trapping, phosphate, nitrate and toxicant assimilation. The importance for streamflow regulation is due to the CVB wetlands which confluence with the Hex River approximately 3.76 km east of the greater mining right area. The importance of sediment trapping, phosphate, nitrate and toxicant assimilation is due to increased hardened surface and stormwater inputs into the CVB wetlands from the surrounding catchment, and urbanised areas. Due to the location of the CVB wetlands within an urbanised and mining area, and impacts from various culvert crossings which may act as a barrier to faunal migration, the wetland provides limited biodiversity maintenance.

The high demand for biodiversity maintenance and potential supply of harvestable resources, cultivated foods and cultural and spiritual activities are ascribed to the close proximity of informal urbanised areas to the wetlands. The limited ecological service provisioning across all components was primarily attributed to the degraded ecological integrity of the wetlands.

Ecological Importance and Sensitivity (EI&S)

The CVB wetlands are considered to be of **Low/Marginal** ecologically important and sensitive. This is mainly due to the seriously modified ecological condition of the Dorpspruit stream due to numerous activities such as alien vegetation encroachment, alterations to the natural flow path as a result of channel straightening, road crossings and the prison dam, as well as anthropogenic disturbances.

Recommended Ecological Category (REC), Recommended Management Objective (RMO) & BAS Category

The Recommended Management Objective (RMO) of the CVB wetlands are to maintain the PES, seriously modified ecological conditions (Category E). However, since a PES Category E/F is considered ecologically unacceptable (Malan and Day, 2012), the recommended Ecological Category (REC) is Category D and therefore, efforts should be made to improve the Ecostatus of the wetlands accordingly. It is acknowledged however that this would require a catchment-wide approach by all stakeholders, and ecological restoration of the wetlands is not the sole responsibility of a single stakeholder.

7.8 Hydropedology

Note: Information for this section was obtained from Zimpande Research Collaborative's (Zimpande) Hydropedological Opinion (2024). Refer to **Appendix C3** for the full report.

7.8.1 Site conditions

The project area for the proposed underground mining right expansion is largely dominated by industrial activities, thus resulting in a significantly modified and heavily transformed landscape setting as well as already disturbed (Witbank – Transported Technosols) soil. Since the industrial area has been developed, it is characterised by impervious surfaces which have altered the hydrological and hydropedological processes of the area, with specific mention to surface runoff, infiltration and subsurface flows (if any). Runoff from the constructed stormwater canal and adjacent roads have potentially augmented the surface water input into the downstream system such that the watercourse receives increased volumes of water, leading to development of prominent wetness indicators and hydrophilic vegetation.

7.8.2 Hydropedological considerations

Recharge of watercourse systems

The project area is dominated by disturbed soils associated with the Witbank (Transported Technosols) soil forms which covers approximately 25.6 ha (62.2%) of the total enclosed area, whilst deep soils of the Swartland soil form account for approximately 10.9% of the total enclosed area. The Witbank soils have been extensively disturbed such that no natural and recognisable diagnostic soil morphological characteristics could be identified. As a result of this modification of the natural horizon, the soil structure and drainage properties have been altered. The Swartland soil form is characterised by an orthic topsoil horizon underlain by a high in clay content, pedocutanic subsurface horizon with a depth of approximately 70 – 80 cm. This soil form is hydropedologically grouped as a recharge deep soil which contribute to the groundwater regime in the landscape. The project area for the proposed underground mining right expansion also characterises shallow soils of the Glenrosa formation. The shallow nature of this soil form is largely attributed to the to rock weathering material which is semi-impermeable, and the soil depth is relatively shallow (0 – 20 cm) hence they quickly result in a generation of overland flow of water during rainfall events. Shallow soils are hydropedologically termed responsive shallow.

Responsive (shallow – watercourse)

A watercourse feature connected to the stormwater canal within the proposed mining area was identified immediately downgradient of the study area. This system is largely hydraulically driven by the discharge from the canal running over the proposed underground mining area. Responsive (shallow - watercourse) soils within a watercourse lead to a rapid runoff response time during intense rainfall events. This is attributed to the already present wetness/surface water which inhibits further water infiltration into the soil. In addition, alluvial soils are often characterised by the presence of an impermeable underlying bedrock which leads to streamflow generation during a rainfall event. These soils are normally associated with artificial and/or natural watercourses such as the channelled valley bottom (CVB) and stormwater diversion and management plans.

Recharge (Deep) soils

These soils are characterised by the absence of any morphological indication of saturation and are typically associated with deep, well aerated, and freely drained soils. The dominant hydrological pathway for the recharge deep soils (Swartland) is vertical through and out the profile into the underlying bedrock. These soils are referred to as recharge soils, as they are likely to recharge groundwater, or lower lying positions in the regolith via bedrock.

Responsive (Shallow) Soils

The Glenrosa soils are loamy to loamy sand and often comprises of rock fragments which makes them relatively shallow (0 – 20 cm soil depth). These soils have a poor topsoil structure that is directly overlying a relatively impermeable bedrock. Responsive shallow soils are often characterized by an abrupt transition between the topsoil and the underlying horizon of a lithic/hard rock material. As a result, their limited water storage capacity that is attributed to their shallow nature inhibits water infiltration into the soil profile, consequently resulting in generation of overland flow following intense rainfall events. The impermeability of the underlying rock promotes slow and limited discharge to the stream on the soil/bedrock interface because it competes with evapotranspiration (ET) extraction of soil water. The slope positioning of the soils is typically the crest and scarp in most instances. Although these are not considered as wetland soils, they contribute significantly towards the recharge mechanisms of wetlands, particularly during rainfall events by means of overland flow.

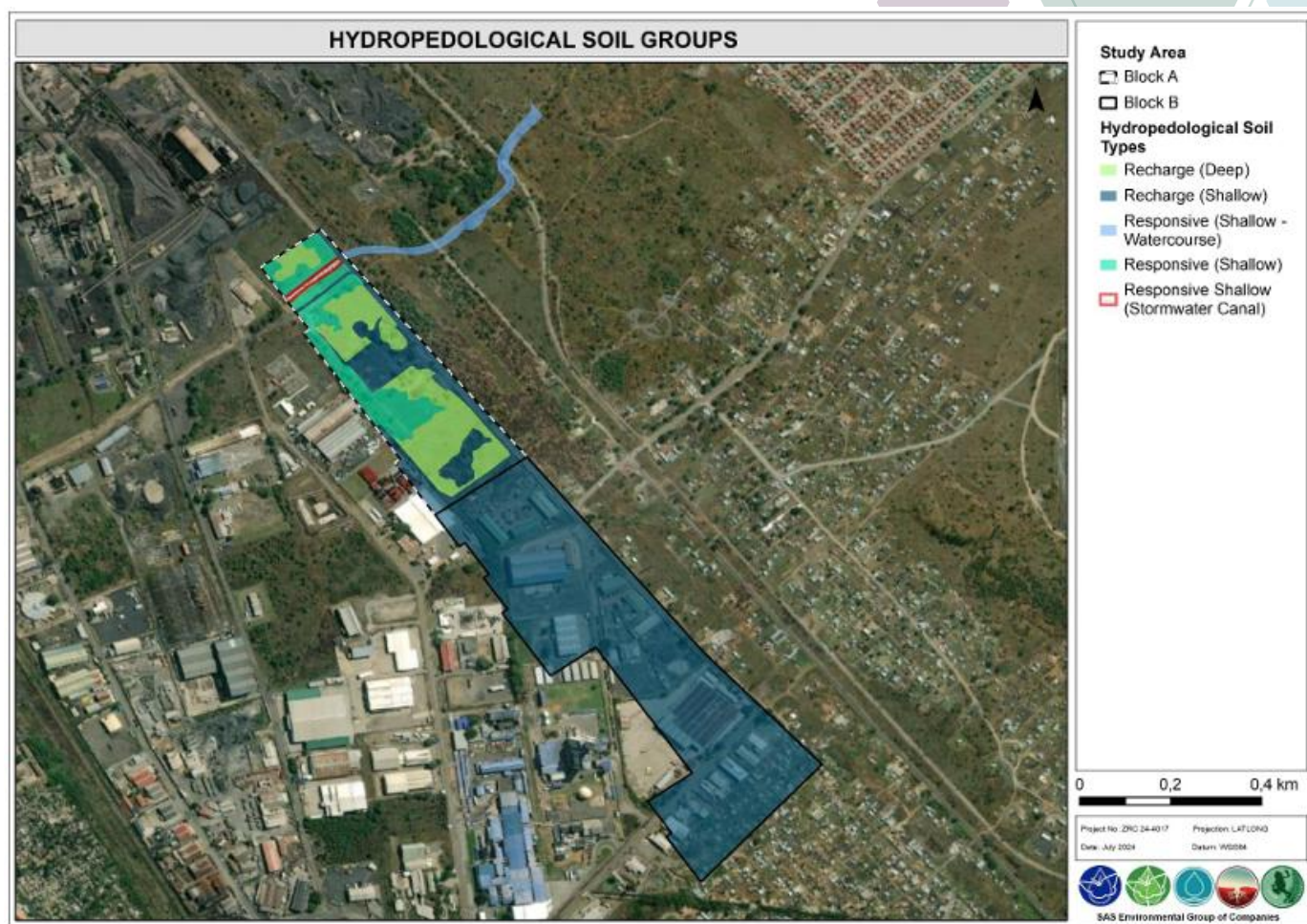


FIGURE 22: HYDROPEDOLOGICAL SOIL GROUPS ASSOCIATED WITH THE SOIL FORMS IDENTIFIED WITHIN THE PROJECT AREA (ZIMPANDE, 2024)

7.8.3 Scientific buffer determination

The perceived impact of the proposed developments on the hydrogeologically important soils is considered to range between low and negligible given the absence of hydrogeologically important soils (interflow soils), as a result, the derivation of a scientific buffer is not deemed necessary, however an edge effect buffer of 50 m is recommended. This buffer serves as a precautionary measure for the proposed development and guides the proponent to minimise the risk of subsidence within the 50 m of the channeled valley bottom (**Figure 23**).

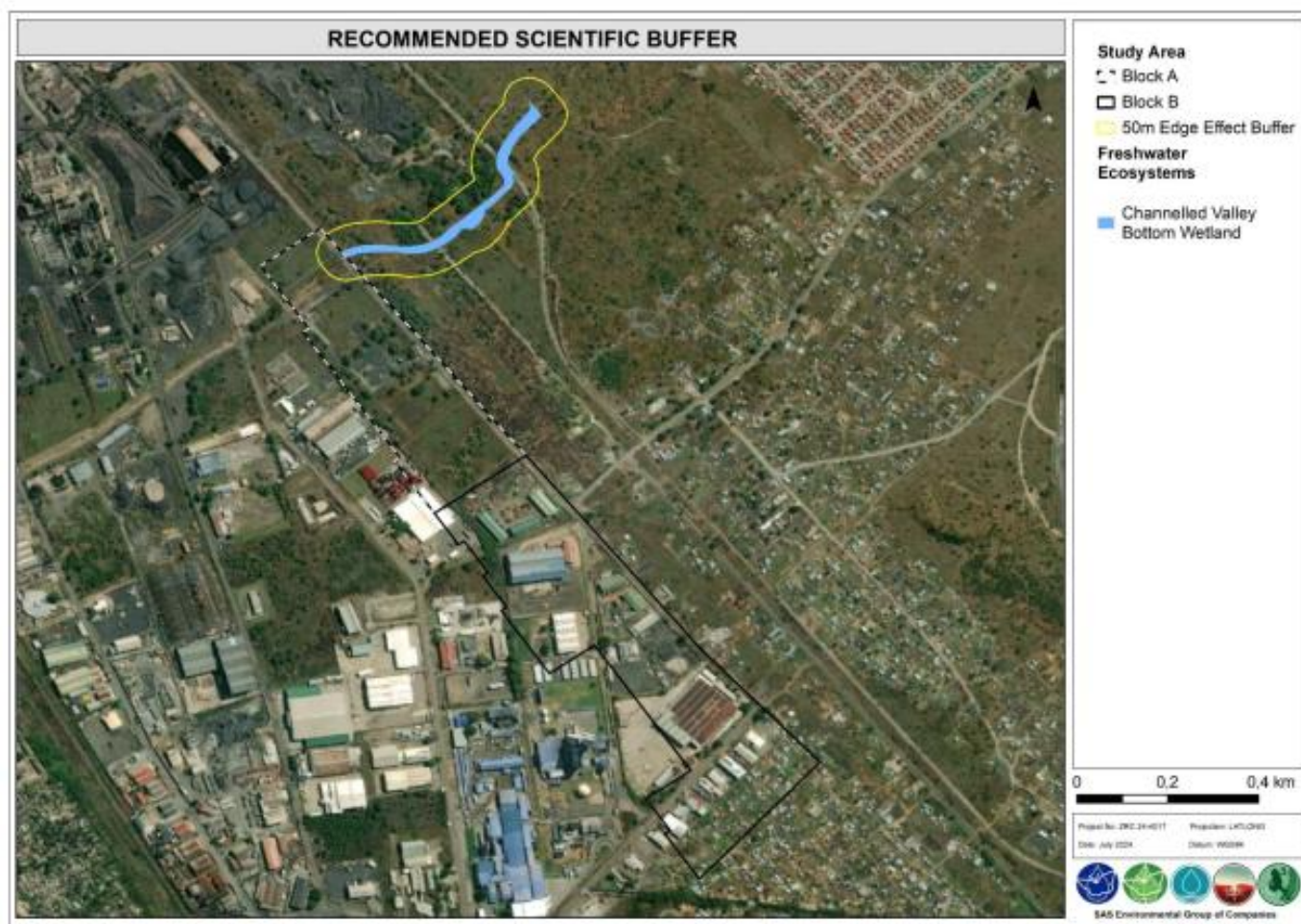


FIGURE 23: MAP DEPICTING THE RECOMMENDED SCIENTIFIC BUFFER (ZIMPANDE, 2024)

7.9 Groundwater

The information from this section has been obtained from the Geohydrological Impact Assessment of the proposed underground mining extension at Kwezi Mine, North West Province (MvB Consulting, 2024). Previous studies and data related to the regional geology in the study area indicate that structural discontinuities such as dykes, fault planes and geological contact zones are the controlling agents for groundwater flow. The crystalline rocks of the BIC do not have primary porosity which would facilitate the flow of groundwater. The following aquifers are present in the study area:

7.9.1 Weathered Aquifer

The mafic intrusive norite that outcrops over most of the study area is characterized by weathering in the first few meters from surface. Norite is often associated with Nickel and Copper, which may give rise to higher naturally occurring concentrations in the groundwater. The weathering follows a broad pattern due to regional stresses and deformation with weathered basins mostly orientated in north-west by south-east trending valleys. This weathered overburden, which covers the project area, forms a shallow unconfined aquifer in the upper 10 to 50 m of the geological succession. The weathered overburden is treated as a single weathered aquifer unit and is described as a “highly weathered, yellowish white to yellowish brown norite.

There are currently no aquifer parameter information available and literature based values indicate that the unit generally has low to moderate transmissivity but high storativity.

7.9.2 Primary Alluvial Aquifer

Along the course of the Hex River and other streams, the weathered aquifer has been partially or totally replaced by alluvial aquifers which were deposited by the river and retained hydraulic connectivity with it. The weathered aquifer is recharged by lateral inflow from the surface streams at saprolite-saprock interfaces.

7.9.3 Secondary Fractured Aquifer

A deeper fractured semi-confined rock aquifer is formed by bedding planes, faults and joint planes of the unweathered norites, anorthosites and pyroxenites of the Rustenburg Layered Suite. In fractured rocks, the interconnected discontinuities are the main passage for groundwater flow. In the project area, regional fracture systems cause the upwelling of deeper groundwater which sustains the aquifer system. The crystalline unweathered and intact rocks are considered to have very low porosity and permeability. The hydraulic conductivity of these units is determined by fractures and mine openings.

An impermeable or semi-permeable interface between the upper weathered, and the deeper, fractured aquifer prevents vertical drainage of the shallow aquifer on a regional scale. Therefore, regionally, the groundwater flow in the shallow aquifer is driven by topographic gradients and local recharge. The vertical infiltration across the interface is governed by fractures, creating zones of permeability.

The soil cover consists mostly of a relatively thin (0-2m) layer of blackish clayey vertisol soil. The soil is a direct weathering product of the norite rocks in the area. In spite of the soil – locally referred to as ‘turf’ – has very high clay content, infiltration does occur through the soil horizon especially through cracks in the soil structure that form in the dry season. Deeper soil and colluvium cover (up to 6 m) is present near the Hex River and drainage lines of the shallow valleys draining the study area.

Reddish sandy loam soils occur in the direct vicinity of the intrusive felsic syenite dykes of Pilanesberg Complex origin. Better infiltration and slightly higher recharge can be expected in these areas.

7.9.4 Hydro Census and Borehole Data ¹

A hydrocensus was undertaken on the 3rd of October 2024 during which twenty-eight (28) properties were visited, and twenty-five (25) boreholes were located, mainly within the industrial area overlying the proposed mining (**Figure 24**) Details of the property owners are presented in

¹ These are industrial areas in which schedule 1 permissible use cannot be applied and as such the area's water consumption needs to be authorised under a GA/WULA under NWA.



FIGURE 24: HYDROCENSUS BOREHOLES (MVB CONSULTING, 2024)

TABLE 21: HYDROCENSUS INFORMATION SUMMARY

Borehole ID	Coordinates			Owner	Borehole Depth	Borehole Use and Abstraction		Hydrogeological information	
	Latitude	Longitude	Elevation			Primary Use	Abstraction Rate	Static Water Level	
			[mamsl]		[m]			[mbgl]	[mamsl]
BH1	-25.6395	27.2289	1149.91	Euro Steel	25	Industrial	0.40	14.51	1135.40
BH2	-25.6390	27.2279	1151.04	Twin Pack	60	Industrial	0.27	18.72	1132.32
BH3	-25.6381	27.2284	1151.23	Mattress & Lounge Corporation	45	Industrial	0.27	15.00	1136.23
BH4	-25.6349	27.2265	1155.00	Chemblocks	45	Industrial	1.11	17.50	1137.50
BH5	-25.6353	27.2265	1155.00	Allied Crane	70	Industrial	0.13	52.57	1102.43
BH6	-25.6320	27.2341	1144.52	Rustenburg Steel Construction	46	Industrial	0.27	13.23	1131.29
BH7	-25.6327	27.2341	1144.17	Flex Self Storage	65	Industrial	0.27	11.13	1133.04
BH8	-25.6347	27.2350	1142.11	Epol	25	Industrial	1.50	4.55	1137.56
BH9	-25.6340	27.2351	1142.25		25	Industrial	Unknown	10.00	1132.25
BH10	-25.6327	27.2359	1141.68	Mmutle Mining Projects	40	Industrial	0.27	19.56	1122.12
BH11	-25.6373	27.2362	1140.00	Khunene Technologies	80	Industrial	0.13	14.86	1125.14
BH12	-25.6372	27.2371	1138.73	Khunene Technologies	100	Not in use	Unknown	15.96	1122.77
BH13	-25.6316	27.2322	1147.14	Afri Readymix	60	Industrial	4.62	9.92	1137.22
BH14	-25.6291	27.2270	1153.09	Rustenburg Galvanisers	50	Industrial	Unknown	8.80	1144.29
BH15	-25.6565	27.2510	1142.53	Private Owner	50	Domestic	0.13	14.57	1127.96
BH16	-25.6290	27.2305	1149.01	Steel Services	120	Industrial	0.27	9.98	1139.03
BH17	-25.6334	27.2332	1145.00	Q4 Fuel Marolien	45	Industrial	Unknown	10.40	1134.60
BH18	-25.6385	27.2305	1147.68	Steel and Pipe	20	Domestic	0.13	3.83	1143.85
BH19	-25.6354	27.2312	1147.64	Bubbles Plastic	40	Domestic	1.38	Borehole covered, no access	
BH20	-25.6271	27.2313	1146.97	Glencore	30	Monitoring	No abstraction	8.05	1138.92
BH21	-25.6268	27.2310	1147.01	Glencore	30	Monitoring	No abstraction	8.08	1138.93
BH22	-25.6277	27.2304	1148.15	Glencore	30	Monitoring	No abstraction	9.75	1138.40
BH23	-25.6276	27.2315	1147.07	Glencore	30	Monitoring	No abstraction	8.82	1138.25
BH24	-25.6297	27.2302	1149.60	SAB	70	Domestic	1.45	8.97	1140.63
BH25	-25.6394	27.2318	1158.45	Maita Wzitoma Properties	Borehole could not be located				
P1	-25.6320	27.2352	1144.99	HMB Airconditioning	No borehole				
P2	-25.6383	27.2291	1149.16	S & S Engineering	No borehole				

Borehole ID	Coordinates			Owner	Borehole Depth	Borehole Use and Abstraction		Hydrogeological information	
	Latitude	Longitude	Elevation			Primary Use	Abstraction Rate	Static Water Level	
			[mamsl]		[m]			[-]	[L/s]
P3	-25.6382	27.2288	1153.49	Blue Ribbon	No borehole				
P4	-25.6361	27.2271	1156.91	Aromax	No borehole				
P5	-25.6332	27.2396	1137.83	Madiba Supermarket	No borehole				
P6	-25.6372	27.2420	1138.18	Private	No borehole				
P7	-25.6394	27.2308	1143.83	Kolas Sports Bar	No borehole				
P8	-25.6446	27.2326	1149.68	Renata Tyres and Mags	No borehole				

Note:

m = metres

mbgl = metres below ground level

mamsl = metres above mean sea level

L/s = liters per second

7.9.5 Aquifer Boundaries

Mine boundaries and aquifer boundaries seldom coincide. Criteria for selecting aquifer boundary conditions are primarily topography, hydrology and geology. The topography, geology, or both, may yield boundaries such as impermeable strata or potentiometric surface controlled by surface water, or recharge/discharge areas such as inflow boundaries along mountain ranges. The flow system allows the specification of boundaries in situations where natural boundaries are a great distance away. Based on these conditions the aquifer boundaries for the study area were selected. The regional mining area can be divided into three (3) aquifers referred to as follows (**Figure 26**).

- SRPM Aquifer – western section of the mining area (including the Kwezi mining extension).
- Kroondal Aquifer – central section of the mining area.
- Marikana Aquifer – eastern section of the mining area

There are additional internal flow boundaries within the delineated aquifer boundaries, and it is possible to further sub-divide the above compartments if required. Most of this study will focus on the SRPM Aquifer.

7.9.6 Groundwater gradients and flow

The hydrocensus groundwater levels as well as the mine groundwater level monitoring was assessed used to develop a regional groundwater level map. The available groundwater levels are shown in **Table 22**.

Typically, a linear relationship exists between the depth to groundwater and the topography since groundwater normally drains under gravity towards streams and rivers. This relationship is known as the Bayesian Correlation and to prove that it exists in the study area the monitoring borehole water levels and collar elevation was plotted. Within the study area, a good correlation (98%) exists (**Figure 25**), indicating that the groundwater flow mimics the topography.

TABLE 22: GROUNDWATER LEVELS

Borehole ID	Coordinates			Groundwater Level	
	X	Y	Z	(m below surface)	(mamsl)
Hydrocensus Boreholes					
BH1	-25.6395	27.2289	1149.91	14.51	1135.40
BH2	-25.6390	27.2279	1151.04	18.72	1132.32
BH3	-25.6381	27.2284	1151.23	15.00	1136.23
BH4	-25.6349	27.2265	1155.00	17.50	1137.50
BH5	-25.6353	27.2265	1155.00	52.57	1102.43
BH6	-25.6320	27.2341	1144.52	13.23	1131.29
BH7	-25.6327	27.2341	1144.17	11.13	1133.04
BH8	-25.6347	27.2350	1142.11	4.55	1137.56
BH9	-25.6340	27.2351	1142.25	10.00	1132.25
BH10	-25.6327	27.2359	1141.68	19.56	1122.12
BH11	-25.6373	27.2362	1140.00	14.86	1125.14
BH12	-25.6372	27.2371	1138.73	15.96	1122.77
BH13	-25.6316	27.2322	1147.14	9.92	1137.22
BH14	-25.6291	27.2270	1153.09	8.80	1144.29
BH15	-25.6565	27.2510	1142.53	14.57	1127.96
BH16	-25.6290	27.2305	1149.01	9.98	1139.03
BH17	-25.6334	27.2332	1145.00	10.40	1134.60
BH18	-25.6385	27.2305	1147.68	3.83	1143.85
BH20	-25.6271	27.2313	1146.97	8.05	1138.92
BH21	-25.6268	27.2310	1147.01	8.08	1138.93
BH22	-25.6277	27.2304	1148.15	9.75	1138.40
BH23	-25.6276	27.2315	1147.07	8.82	1138.25

Borehole ID	Coordinates			Groundwater Level	
	X	Y	Z	(m below surface)	(mamsl)
BH24	-25.6297	27.2302	1149.60	8.97	1140.63
Mine Monitoring Borehole					
BF01	27.21622	-25.5989	1153.9	16.23	1137.67
BFU339	27.21174	-25.5946	1175.3	15.23	1160.07
BFU340	27.21136	-25.5946	1152.8	15.63	1137.17
EM05	27.30038	-25.6683	1121.7	8.7	1113
EM11	27.34803	-25.6846	1148.4	10.01	1138.39
EM24	27.33357	-25.6323	1118.8	0.18	1118.62
EM52	27.31982	-25.628	1120.5	0.82	1119.68
EM53	27.31978	-25.628	1111	0.4	1110.6
EM54	27.37464	-25.7019	1182.4	4.15	1178.25
EMX	27.30855	-25.6562	1125.5	7.2	1118.3
GW01	27.28734	-25.6803	1137.8	45	1092.8
GW09	27.28912	-25.6831	1158.7	6.3	1152.4
GW14	27.29726	-25.688	1154.3	8.3	1146
GW22	27.29504	-25.6543	1116	0.75	1115.25
GW25	27.37311	-25.688	1180	0.45	1179.55
GW26	27.36976	-25.7052	1184.5	11.33	1173.17
GW32	27.37234	-25.6613	1172	6.9	1165.1
GW33	27.41768	-25.6841	1176.9	1.03	1175.87
GW45	27.29973	-25.6886	1140.7	16.73	1123.97
KC BH02	27.36836	-25.7013	1153.7	12.61	1141.09
KC BH03	27.36853	-25.7011	1144.1	12.6	1131.5
NB02	27.31365	-25.6753	1136.8	2.75	1134.05
NB05	27.30171	-25.6689	1126.2	11.41	1114.79
NB07	27.32562	-25.6611	1136.7	2.2	1134.5
NB10	27.30272	-25.6373	1115.2	2.4	1112.8
NB11	27.30923	-25.6515	1121.1	5.93	1115.17
NB12	27.36781	-25.697	1176.2	26.1	1150.1
NB12A	27.36766	-25.6991	1170.2	18.13	1152.07
NB14	27.37075	-25.7013	1185.5	6.45	1179.05
NB16	27.41763	-25.6911	1186.1	7.3	1178.8
NB17	27.42363	-25.6919	1179.7	19.8	1159.9
NB18	27.40979	-25.6918	1185.5	23.16	1162.34
NB20	27.40042	-25.6867	1184.9	7.37	1177.53
NB25	27.33733	-25.6347	1119.3	2.3	1117
NB26	27.33971	-25.6348	1124.7	2.62	1122.08
NB27	27.34221	-25.6362	1123.5	5.04	1118.46
NB28	27.37817	-25.6857	1190.3	5.3	1185
NB29	27.36942	-25.6906	1177.9	9.6	1168.3
NB31	27.3317	-25.6649	1134.4	4.33	1130.07
NB35	27.30049	-25.6898	1137.9	9.26	1128.64
NB36	27.3022	-25.6908	1133.2	7.97	1125.23
NB37	27.26197	-25.6241	1131.1	18.96	1112.14
NB39	27.2592	-25.627	1127.5	6.02	1121.48
NB47	27.33154	-25.6667	1139	4.25	1134.75
NB51	27.33617	-25.6813	1136.5	11.5	1125
NB55	27.35201	-25.6784	1160.2	1.8	1158.4
NB56	27.35094	-25.6807	1159.2	2.2	1157
NB57	27.34907	-25.6812	1162	2.9	1159.1
NB58	27.3795	-25.6656	1196.8	48	1148.8
NBH01	27.21771	-25.6004	1163.8	25.94	1137.86
NBH02	27.24951	-25.6301	1127.3	7.23	1120.07

Borehole ID	Coordinates			Groundwater Level	
	X	Y	Z	(m below surface)	(mamsl)
NBH04	27.30655	-25.613	1111.2	1.5	1109.7
NBH05	27.29631	-25.6284	1101.9	4.43	1097.47
NBH06	27.30254	25.66301	1128.1	7.69	1120.41
NBH09	27.36777	-25.6975	1173.8	31.58	1142.22
PD05	27.3067	-25.6215	1169.5	1.45	1168.05
RPM HD2	27.43028	-25.6729	1157.3	1.6	1155.7
RPM HD3	27.43175	-25.6727	1156	1.8	1154.2
RPM HD4	27.43179	-25.6731	1155.8	2.8	1153
RPM09	27.37291	-25.6602	1168.5	4.83	1163.67
SRK 04	27.41775	-25.6616	1164.1	7.36	1156.74
SRK 08	27.42069	-25.6688	1162.4	5.4	1157
TL1	27.26153	-25.629	1125.7	7.02	1118.68
WAPBH01	27.41933	-25.6677	1167.3	6.34	1160.96
WAPBH03A	27.41789	-25.6725	1160.6	1.3	1159.3
WAPBH03B	27.4179	-25.6725	1162.6	1	1161.6
WAPBH04A	27.42665	-25.6735	1154.5	2.45	1152.05
WAPBH05	27.42647	-25.6739	1156.3	2.35	1153.95
WAPBH06	27.42636	-25.674	1159.1	4.6	1154.5
WAPBH07	27.41533	-25.6817	1171.2	3.17	1168.03
WAPBH08	27.42026	-25.6822	1169.4	6.3	1163.1
WAPBH09A	27.31116	-25.6533	1127.4	2.3	1125.1
WAPBH09B	27.31119	-25.6532	1126.9	2.1	1124.8
WAPBH09C	27.31126	-25.6532	1127.4	1.81	1125.59
WAPBH10	27.29387	-25.62	1105.4	9.9	1095.5
WAPBH11	27.29888	-25.6174	1112.3	2.64	1109.66
WAPBH12	27.38209	-25.7025	1198.2	9.6	1188.6
WAPBH13	27.39401	-25.6784	1194.8	8.9	1185.9
WAPBH14	27.40877	-25.6636	1178.6	11.1	1167.5
WAPBH15	27.41259	-25.6642	1173.7	2.32	1171.38
WAPBH16A	27.41612	-25.6647	1170.6	9.12	1161.48
WAPBH16B	27.41522	-25.6643	1173.4	8	1165.4
WAPBH17	27.41973	-25.6677	1160.6	7.4	1153.2
WAPBH18A	27.41899	-25.6709	1165.8	4.3	1161.5
WAPBH18B	27.41852	-25.6709	1165.8	4.45	1161.35
WLTR 1L	27.40488	-25.6813	1177.1	1.85	1175.25
WV BH01	27.27708	-25.6771	1138.9	5.47	1133.43
WV BH04	27.27929	-25.6778	1130.2	6.96	1123.24
WV BH05	27.27911	-25.6795	1127.5	5.55	1121.95
WV BH06	27.28424	-25.6824	1129.1	9.6	1119.5

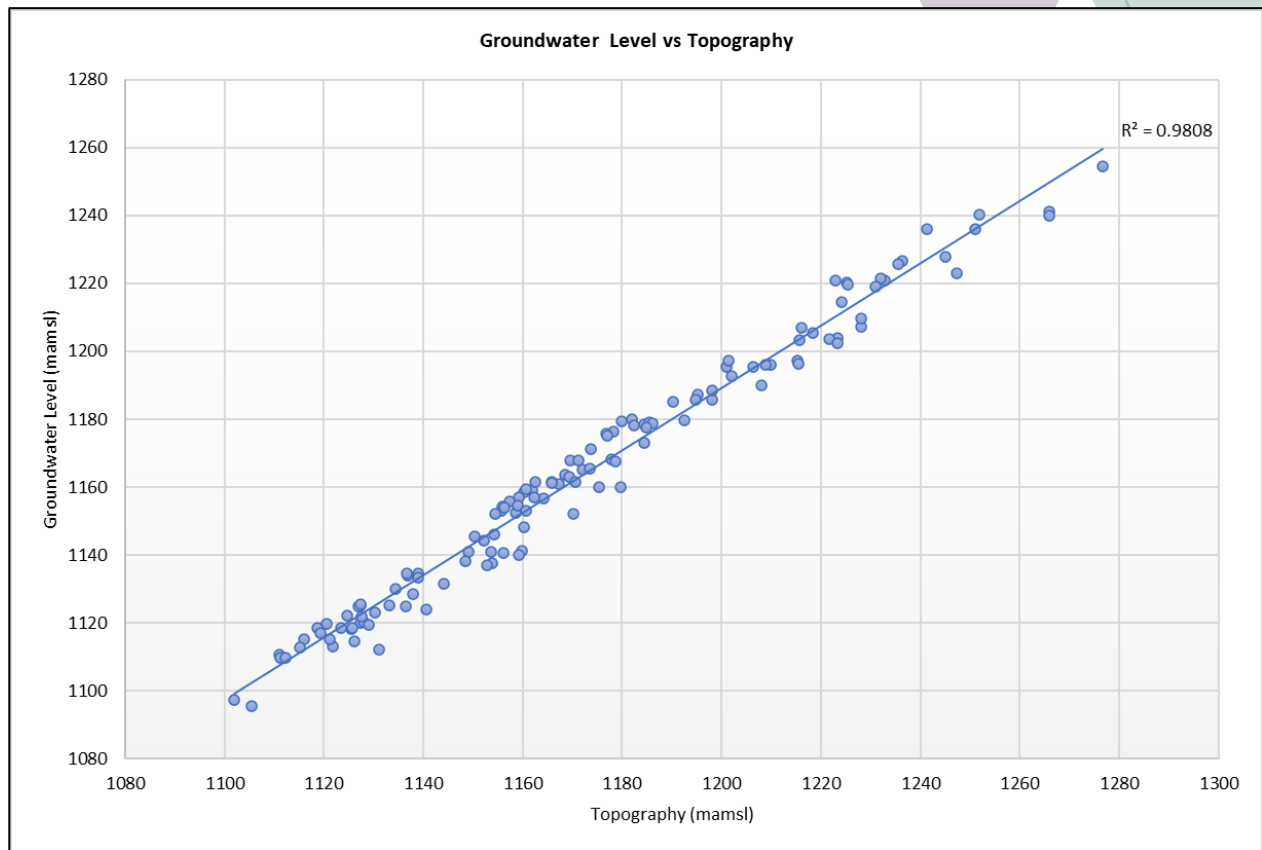


FIGURE 25: RELATIONSHIP BETWEEN TOPOGRAPHY AND GROUNDWATER TABLE

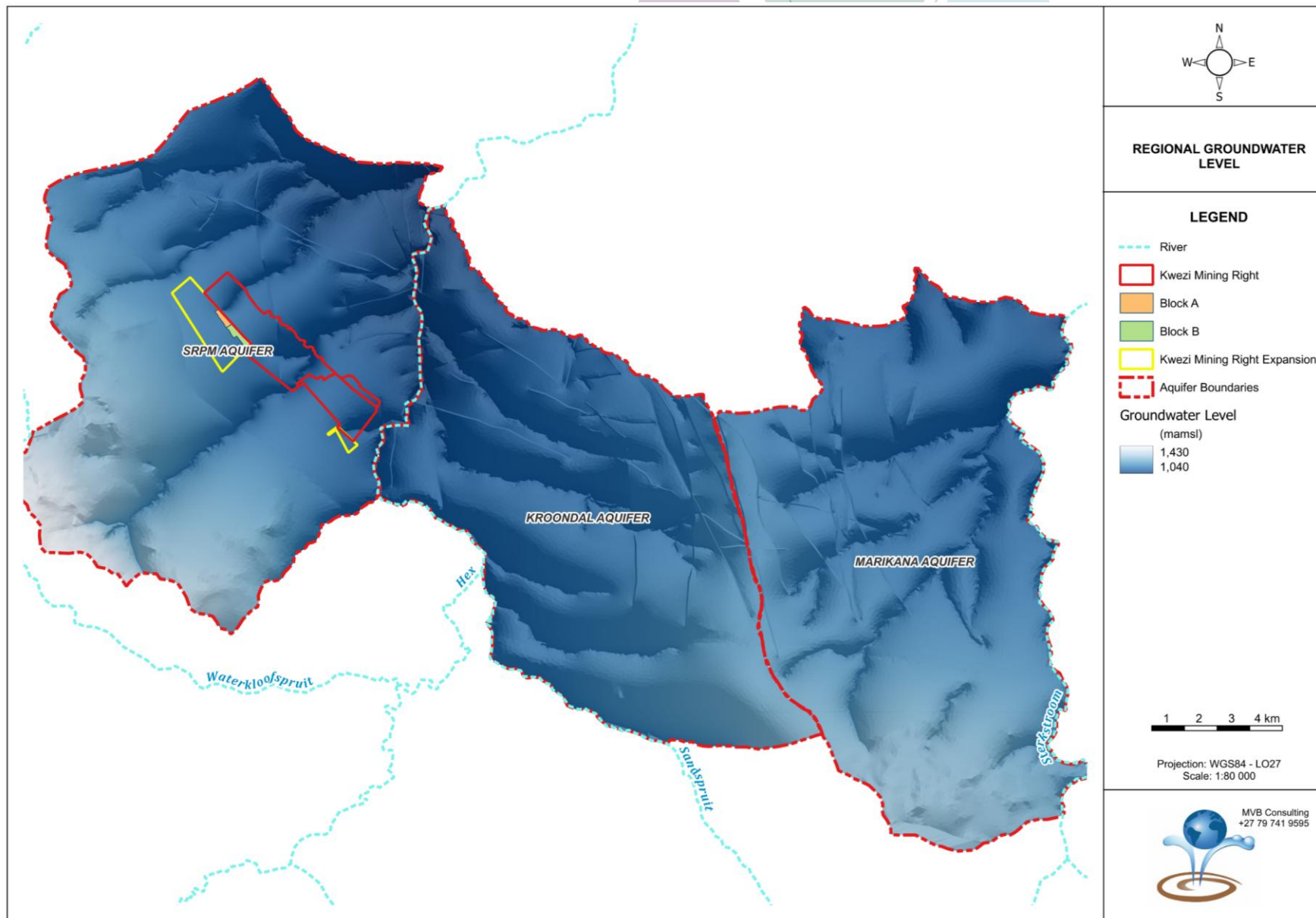


FIGURE 26: REGIONAL GROUNDWATER GRADIENTS AND AQUIFER BOUNDARIES

7.10 Air Quality

Sources of air pollution in the area are mining activities, informal settlements, industrial activities, as well as domestic fuel burning, biomass burning, vehicle entrainment from unpaved roads, informal waste combustion, wind-blown dust from open areas, vehicle tailpipe emissions. Contributors to dust fallout include unpaved roads, agricultural activities (seasonal) and mining related activities. Sibanye also operates a network of dust buckets for the purpose of monitoring monthly fallout in and around the areas of operation.

7.11 Noise

The area around Rustenburg is characterised by the presence of a large number of mining related activities. There are probably few places where the presence of these activities can be seen or heard. This means that industrial noise very much forms part of the present ambient noise climate in the environments where the proposed new developments are to take place. The following major noise sources could be identified:

- Mining related activities including ventilation shafts
- Industrial noise sources, e.g. various plants in Rustenburg East
- Road transport noise, e.g. noise caused by traffic on the provincial road from Rustenburg to Marikana and localised traffic. Due to the industrial character of the area this traffic includes a high percentage of heavy vehicles;
- Rail traffic

The Kwezi Shaft areas have a number of contributing factors to noise. This includes the surrounding agricultural and residential areas and areas where mining-related activities and industries.

7.12 Archaeology and Cultural Heritage

Note: Information for this section was obtained from J.A. van Schalkwyk's desktop heritage assessment (2024). Refer to **Appendix C1** the full report.

The heritage desktop assessment done for this project consisted of two elements. Firstly, a review was done of all available published as well as unpublished papers, books and reports (mostly Heritage Impact Assessments (HIAs)) in the larger region as well as the Project Area. The second element consisted of a diachronic review of available official topographic maps (mostly at a 1:50 000 scale) and aerial photographs of the Project Area specifically.

Based on this assessment, it became clear that this region has a low sensitivity for heritage sites and it is highly unlikely that any sites, features or objects of cultural significance would have existed within the boundaries of the Project Area. Various factors would have contributed to this:

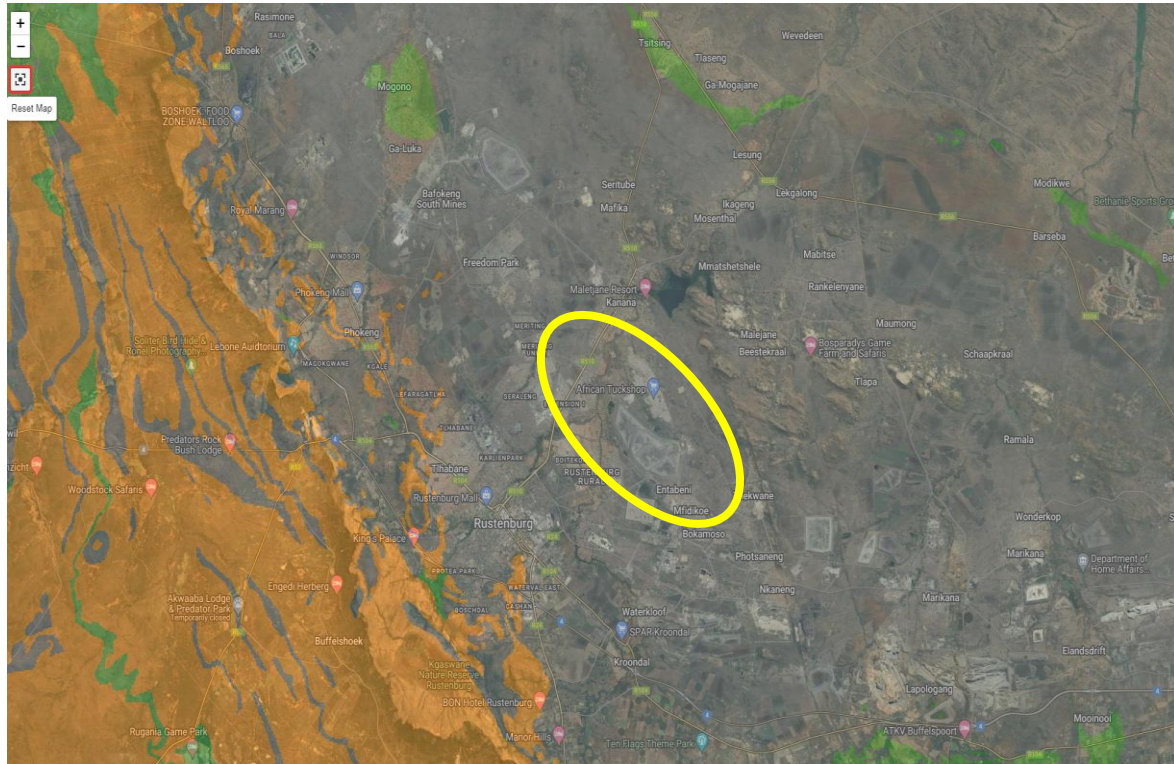
- The absence of perennial streams, hills and outcrops would have made this unattractive for settlement during pre-colonial times. Outcrops and hills were used during the Stone Age for people to shelter in. During the Iron Age, especially the Late Iron Age, settlements were developed based on strict socio-cultural and religious viewpoints that had to be adhered to. In order express this, walling, either from wood, mud or stone were used to create the various required spaces.
- The soils of the surrounding area, covering most of the Springbok flats, is generally not considered suitable for building on as the clayey nature makes it to retain water and it becomes sticky and even plasticine like. On drying out, shrinkage occur and any built structure without suitable foundations quickly starts to crack.
- Past and recent activities such as farming (ploughing), urban expansion and the development of the mining activities would have negatively impacted on and destroyed any heritage sites and features if it did exist in the Project Area in the past.

It is the opinion of the heritage consultant that there are no known sites, features or objects of cultural heritage significance that would be compromised in the event of any subsidence occurring as a result of the underground

mining and it is the heritage consultant's conclusion that from a heritage point of view the mining project should be allowed to proceed.

7.13 Palaeontology

According to the South African Heritage Resources Agency's (SAHRA) palaeontological sensitivity map, the study area is indicated as of an insignificant nature and no further studies are required (**Figure 27**).



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

FIGURE 27: PALEONTOLOGICAL SENSITIVITY OF THE APPROXIMATE STUDY AREA (YELLOW POLYGON) AS INDICATED ON THE SAHRA PALAEONTOLOGICAL SENSITIVITY MAP

7.14 Visual

The initial establishment of the Kwezi Shaft operations and its associated infrastructure has already altered the visual landscape of the area. The highly sensitive receptors that surround the mining operation have already been visually impacted upon and the sense of place drastically altered due to the initial establishment of infrastructure that is not congruent to that of the visual backdrop.

7.15 Socio-Economic

The North West province as a whole has had a positive net migration in recent years. More people are migrating to the province than from the province. Urbanisation toward the larger towns and cities is also very common and municipalities need to improve planning in this regard.

The local municipality population comprises of 549 575 people according to Stats SA. This population consist of 199 044 households, which on average, consist of 2.5 people. The population is dominated by the working class with more than 70 per cent of the population between the ages of 15-64. Setswana is the predominant language spoken in the province, followed by Afrikaans and IsiXhosa.

In terms of the North-West Provincial Development Plan (North West Planning Commission, 2013), the following development objectives have been set:

- Eliminate income poverty: reduce the percentage of the population living in poverty from 46 per cent to 0 percent in 2030;
- Reduce inequality: the Gini coefficient should fall from 0.61 to 0.53;
- The unemployment rate should fall from 24 per cent in 2010 to 14 per cent by 2020 and to 6 per cent by 2030. This requires an additional 770 500 jobs. Total employment should rise from 748 000 to 1 563 000;
- The labour force participation rate should increase from 52 per cent to 58 percent in 2020 and 64 percent in 2030;
- The provincial Gross Value Added ("GVA") should increase by 2.9 times in real terms. Such growth will require an average annual GVA growth of 5.4 percent;
- Raise per capita income from R 67 700 in 2011 to R 120 000 by 2030; and
- On average, the dependency ratio (the number of people depending on one wage earner) will decrease from 3.4 in 2010 to 1.5 in 2030. A falling dependency ratio will be a central contributor to reducing poverty.

The following sector priorities have been set for the mining industry:

- Mining must create 55 000 additional jobs by 2030 to sustain 218 000 direct jobs which will represent 13.9 percent of the total provincial employment;
- Mining must maintain an average growth rate of 2.5 percent between now and 2030. Against this growth rate, the GVA contribution of the sector will increase from R 54.97 million to R 90.08 million in 2030 (2010 R-values); and
- The sectoral GVA contribution of mining will be reduced from 37.7 percent in 2010 to 21.6 percent in 2030.



ENVIRONMENTAL IMPACT ASSESSMENT

8. ENVIRONMENTAL IMPACT ASSESSMENT

The impact assessment relates to the application for the expansion of the Kroondal Mining Right (80 MR) to include the additional UG2 blocks A and B.

8.1 Methodology to be used

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

TABLE 23 SCALE UTILISED FOR THE EVALUATION OF THE ENVIRONMENTAL RISK RATING

Evaluation Component	Rating	Scale	Description
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	Impact in perpetuity. –
	4	Long term	Impact ceases after operational phase/life of the activity > 60 years.
	3	Medium term	Impact might occur during the operational phase/life of the activity – 60 years.
	2	Short term	Impact might occur during the construction phase - < 3 years.
	1	Immediate	Instant impact.
EXTENT (or spatial scale/influence of impact)	5	International	Beyond the National boundaries.
	4	National	Beyond provincial boundaries, but within National boundaries.
	3	Regional	Beyond 5 km of the site and within the provincial boundaries.

Evaluation Component	Rating	Scale	Description
	2	Local	Within a 5 km radius of the site.
	1	Site-specific	On site or within 100 meters of the site boundaries.
	0	None	Zero extent.
IRREPLACEABLE loss of resources	5	Definite	Definite loss of irreplaceable resources.
	4	High potential	High potential for loss of irreplaceable resources.
	3	Moderate potential	Moderate potential for loss of irreplaceable resources.
	2	Low potential	Low potential for loss of irreplaceable resources.
	1	Very low potential	Very low potential for loss of irreplaceable resources.
	0	None	Zero potential.
REVERSIBILITY of impact	5	Irreversible	Impact cannot be reversed.
	4	Low irreversibility	Low potential that impact might be reversed.
	3	Moderate reversibility	Moderate potential that impact might be reversed.
	2	High reversibility	High potential that impact might be reversed.
	1	Reversible	Impact will be reversible.
	0	No impact	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.
	0	No probability	Zero probability.
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 24**. The Environmental Significance rating process is completed for all identified potential environmental impacts both before and after implementation of the recommended mitigation measures.

TABLE 24: 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 at.
40 – 74	Medium (M)	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	Low (L)	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	Positive impact (+)	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

8.2 Cumulative Impact

In terms of the impact to the socio-economic environment, this application is for the inclusion of an additional area into an existing mining right. The identified socio-economic impacts (positive) include the creation of employment; creation of training and skills development opportunities and the creation of socio-economic opportunities and procurement associated with project. These impacts are positive, with mitigation these positive impacts will increase.

8.3 Impacts and risks associated with the proposed project

Impacts and risks identified during the impact assessment phase and the significance thereof are shown in **Table 34** and **Table 35**. The sections below provide modelling results and a summary of the impact to be expected.

8.3.1 Wetlands

No natural occurring freshwater ecosystems, as per the NWA was noted within the project area. A Channelled Valley Bottom (CVB) wetland was identified within the north eastern portion of the investigation area. The PES was determined to be Category E (Seriously Modified) and the Ecoservices Importance was found to be very low to low.

Based on the PES and EIS of the CVB wetland and the findings, the activities associated with the proposed undermining of the CVB wetland will pose a “Low” risk to ongoing functionality of the wetland.

8.3.2 Hydropedology

The perceived impact of the proposed developments on the hydropedologically important soils is considered to range between low and negligible given the absence of hydropedologically important soils (interflow soils), as a result, the derivation of a scientific buffer is not deemed necessary, however an edge effect buffer of 50 m is recommended. This buffer serves as a precautionary measure for the proposed development and guides the proponent to minimise the risk of subsidence within the 50 m of the channelled valley bottom.

8.3.3 Heritage

The Heritage Desktop Assessment found that the region has a low sensitivity for heritage sites and it is highly unlikely that any sites, features or objects of cultural significance would have existed within the boundaries of the Project Area.

8.3.4 Blasting and vibration

Undermining surface structures by means of drilling and blasting will result in the said surface structures experiencing some form of vibration. These vibrations are typically measured as peak particle velocities, and reported in mm/sec. In South Africa, guidelines in terms of maximum allowable Peak Particle Velocity (PPV) is not readily available and thus, the guidelines set out by the United States Bureau of Mines (USBM) are typically used. The guidelines prescribed by the USBM is tabulated in **Table 25**.

TABLE 25: GROUND VIBRATIONS LIMITES AS PER USBM

Structure Description	Ground vibration limit (mm/sec)
National Roads/Tar roads	150
Electrical Line (Pylons)	75
Railways	150
Transformers	25
Gas/Fuel Lines	25
Water Wells	50
Telecoms Tower	50
General Houses of Proper Construction	25
Houses of Less Proper Construction	12.5
Rural buildings – Mud houses	6

PPVs were calculated for a 2.0m and 3.0m face advance using a single 38mm diameter blast hole and repeated for two holes being set off with delays less than 8 milliseconds. The outcome of the analysis is depicted in graphical form in **Figure 28**. Given the fact that mining is not planned closer than 40.0m from surface, the 40.0m below surface point on the graph can be regarded as the worst-case scenario.

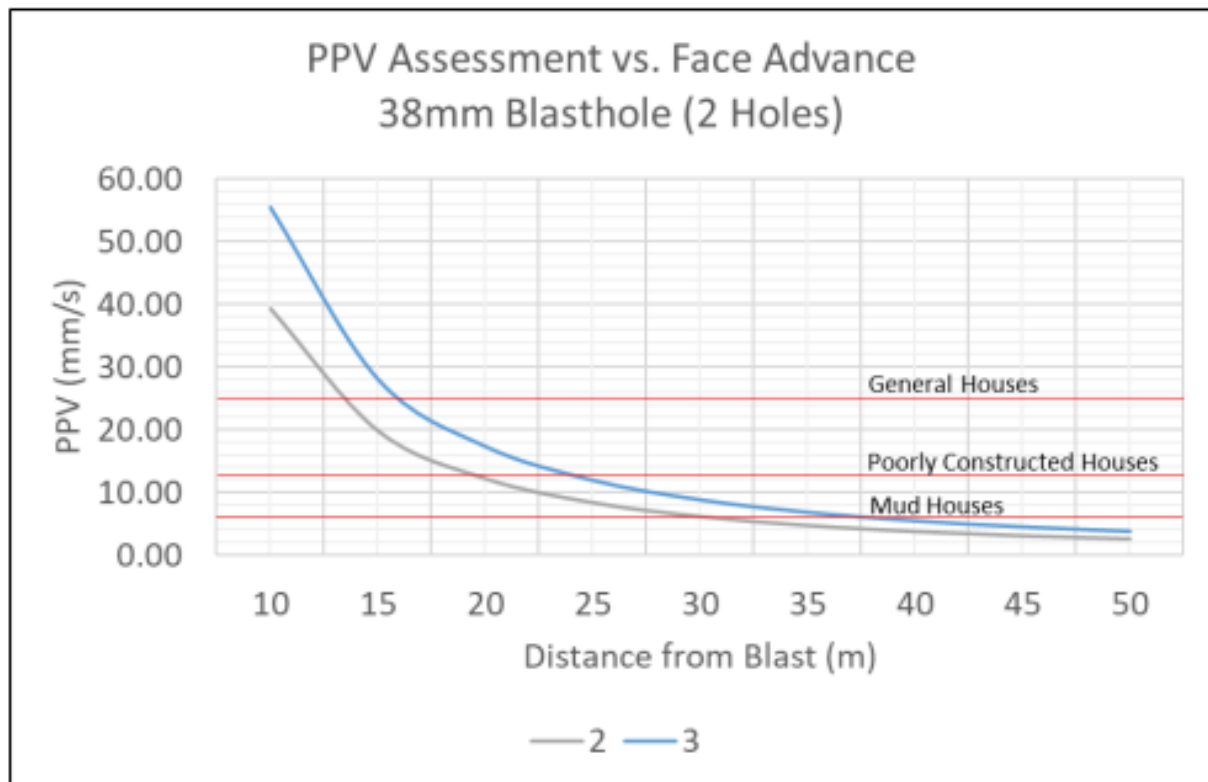


FIGURE 28: PPV FOR A SINGLE 38MM BLASTHOLE AS A FUNCTION OF DISTANCE AND FACE ADVANCE (OHMS, 2024)

The assessment indicates that for a 3.0m face advance, the 6mm/sec criteria is exceeded at a distance of approximately 37.0m (below surface). For a 2.0m face advance, the same criteria are exceeded at a distance of approximately 30.0m below surface.

In order to visualize the likely permitted face advance in the planned mining area, the planned mining was divided into four depth classes namely 0-25mbs, 25-50mbs, 50-75mbs and 75-100mbs. Considering a factor of safety of some 1.4, the minimum depth at which 3.0m advance rates should be employed is 50.0m and is depicted in light blue in **Figure 29**. Since the minimum criteria is exceeded, even when using 2.0m advances at 30.0mbs, mining below this depth is not envisaged. **Figure 30** depicts the areas where mining is currently planned below 35.0mbs, and that should be excluded from the mining plan.

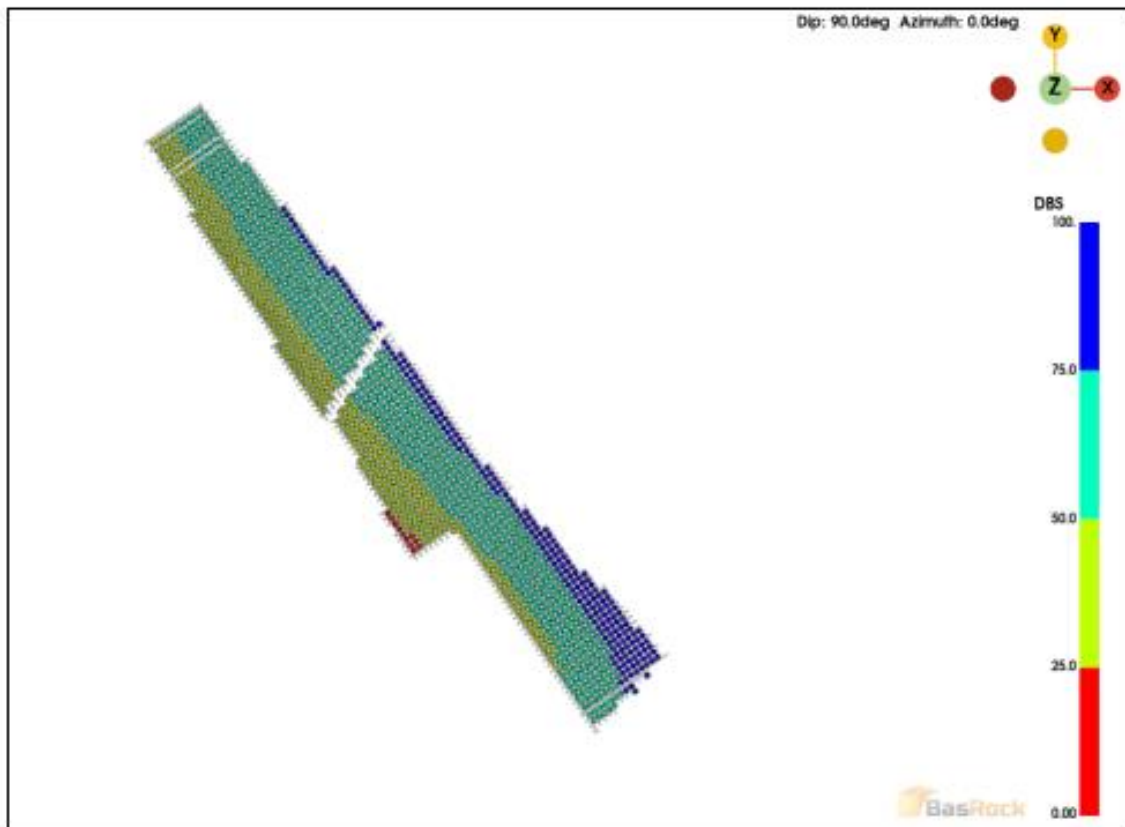


FIGURE 29: DEPTH CLASSES FOR THE PLANNED MINING AREA (OHMS, 2024)

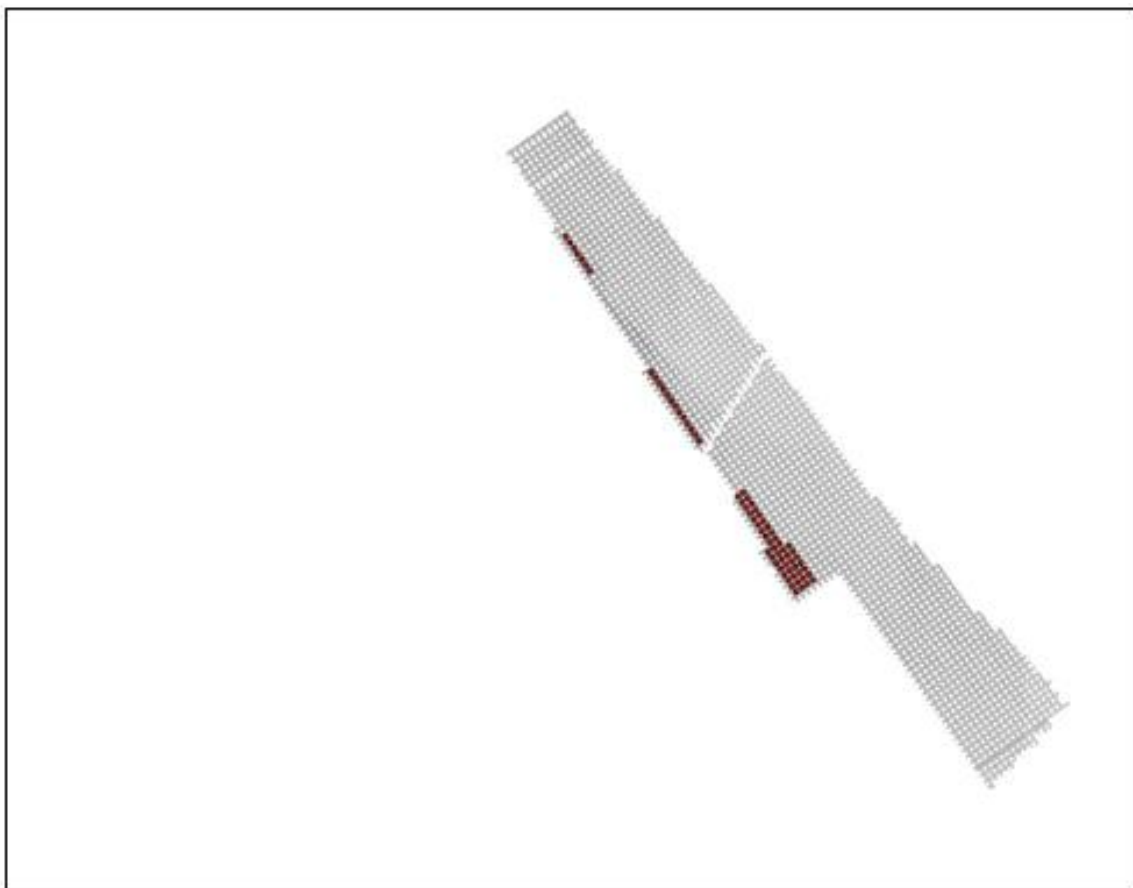


FIGURE 30: AREAS <35.0MBS IN THE PROPOSED MINING AREA (OHMS, 2024)

8.3.5 Stability Assessment

Numerical modelling, for the purpose of pillar stability, was conducted using the Map3D software suite.

The pillar width-to-height ratio informs the pillar confinement. Confinement in a pillar has a significant influence on the overall strength of the pillar. **Table 26** depicts the design criteria limits for the different pillar systems. Included in the table is the typical factors of safety and pillar systems associated with specific width to height ranges.

TABLE 26: PILLAR SYSTEM WIDTH TO HEIGHT RATIOS AND FACTOR OF SAFETY

Pillar System	Width to Height (W:H)	Factor of Safety
Stable non yield	$2.5 < W:H < 5.0$	$FoS > 1.6$
Yield	$3.0 < W:H < 4.0$	$1.0 < FoS < 1.6$
Crush	$1.7 < W:H < 2.5$	$FoS < 1.0$

The pillars under consideration are meant to be stable, non-yield pillars and thus requires width to height ratios > 2.5 and factors of safety > 1.6 .

In terms of the Pillar Risk Potential, the pillar risk can be assessed by utilizing the theoretical Extraction Ratio (e) and the Stress Concentration Factor (SCF). **Figure 31** illustrates the relationship between pillar stress level (SCF) and extraction ratio (e). When operating at a high extraction ratios, a high incremental change in pillar stress level is observed, for a small change in extraction ratio. Based on the extraction ratio and resultant stress levels, the pillars can be classified as low ($e < 0.75$), medium ($0.75 < e < 0.85$), or high-risk pillars ($e > 0.85$).

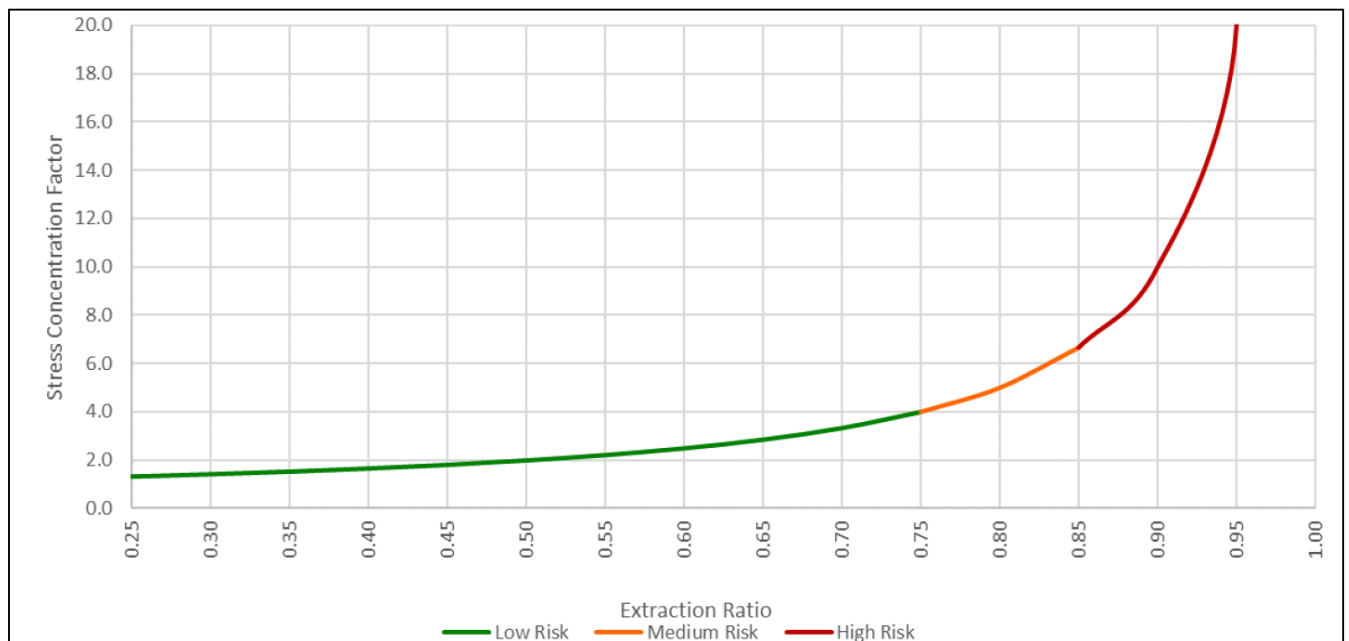


FIGURE 31: RELATION BETWEEN PILLAR STRESS LEVEL AND EXTRACTION RATIO

The pillar stability assessment for the future design layout was conducted using the mining layout provided by the mine. **Figure 32** depicts the design layout with the pillar Factor of Safety (FoS) values for the bord and pillar sections of the layout. From the figure, it is evident that the planned mining area has factors of safety well above 1.6. In the as-mined area however, factors of safety range from 1.0 to > 5.0 .

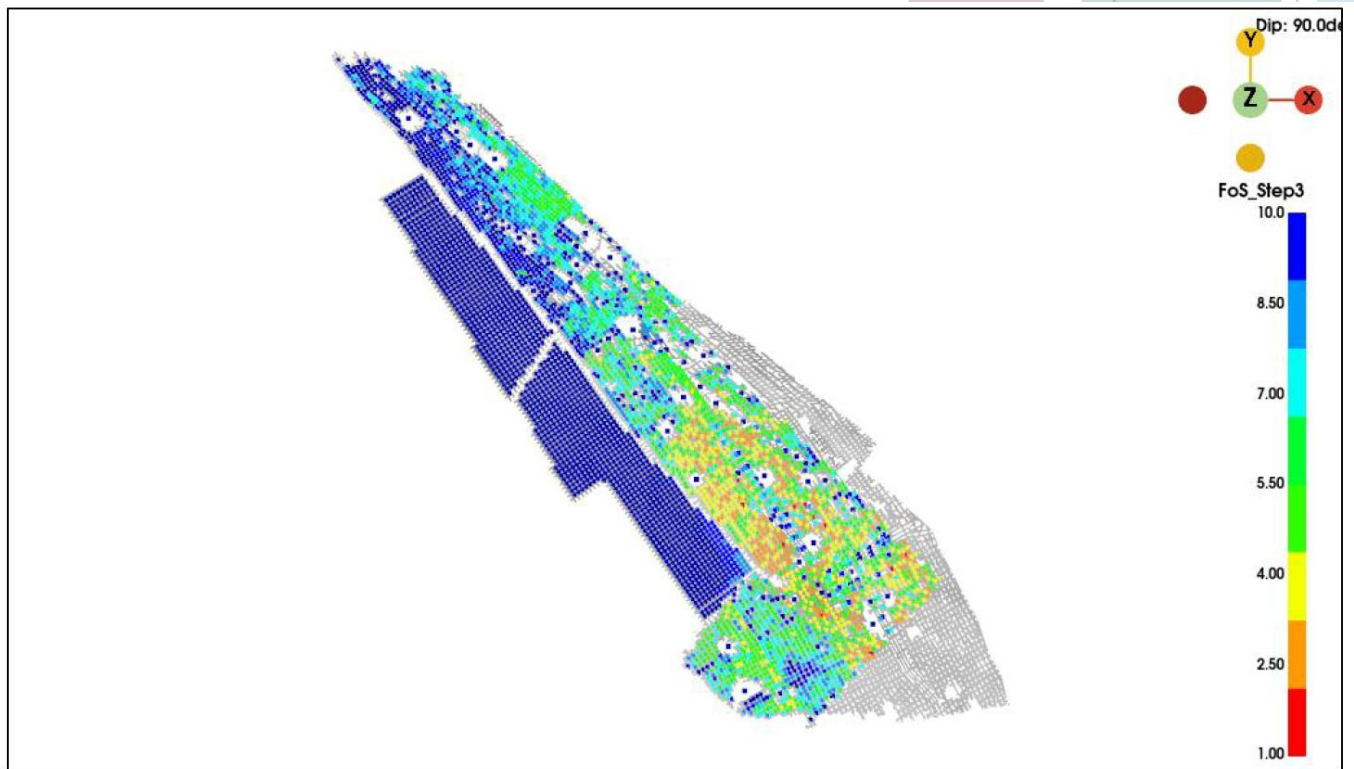


FIGURE 32: DESIGN LAYOUT PILLAR FACTOR AND SAFETY

Figure 33 depicts the outcome of the quantitative stress concentration factor calculation on each individual pillar. **Figure 34** classifies each individual pillar according to its perceived risk as per the risk graph in **Figure 31**. From the risk classification assessment, it should be noted that the risk rating for the proposed pillars is all classified as “Low”

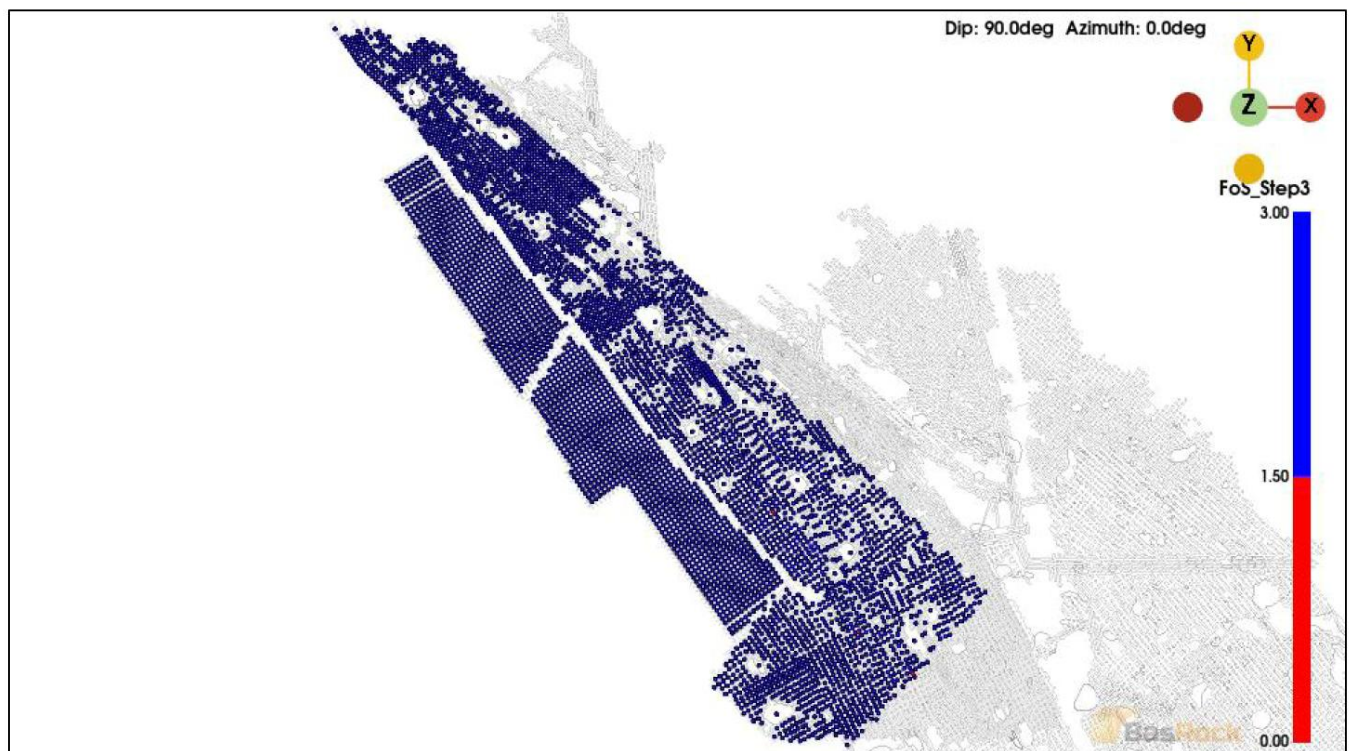


FIGURE 33: CLASSIFIED FACTORS OF SAFETY FOR THE AREAS UNDER CONSIDERATION

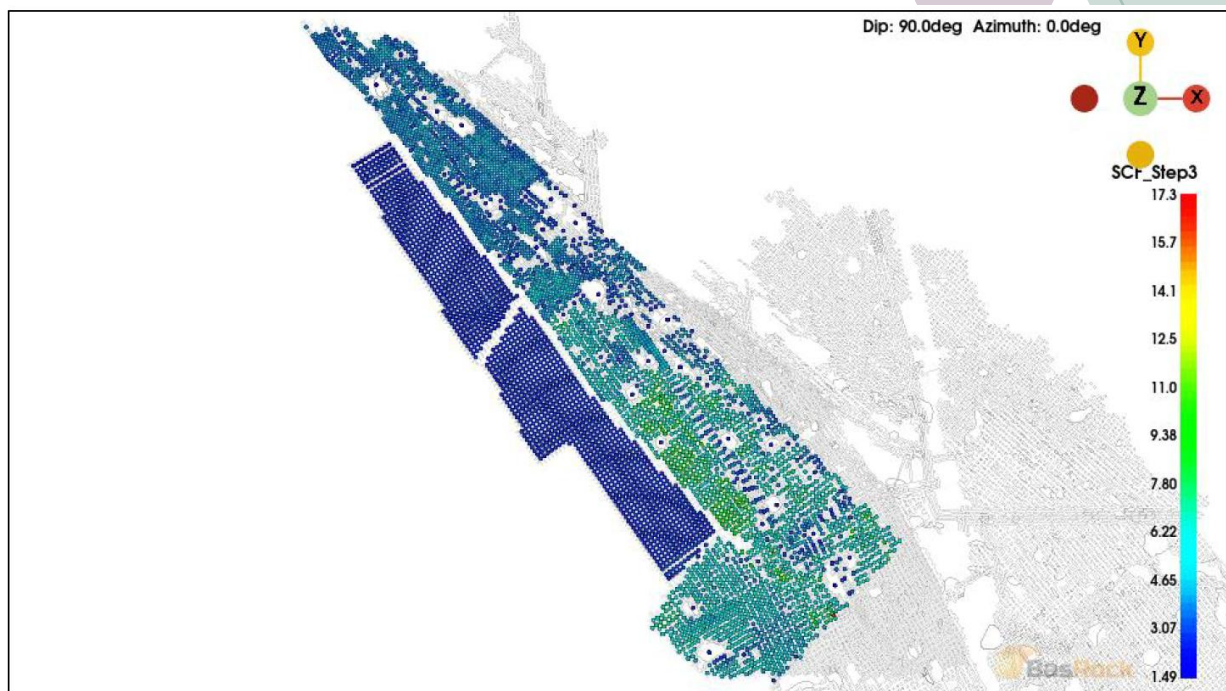


FIGURE 34: CALCULATED STRESS CONCENTRATION FACTOR FOR EACH PILLAR

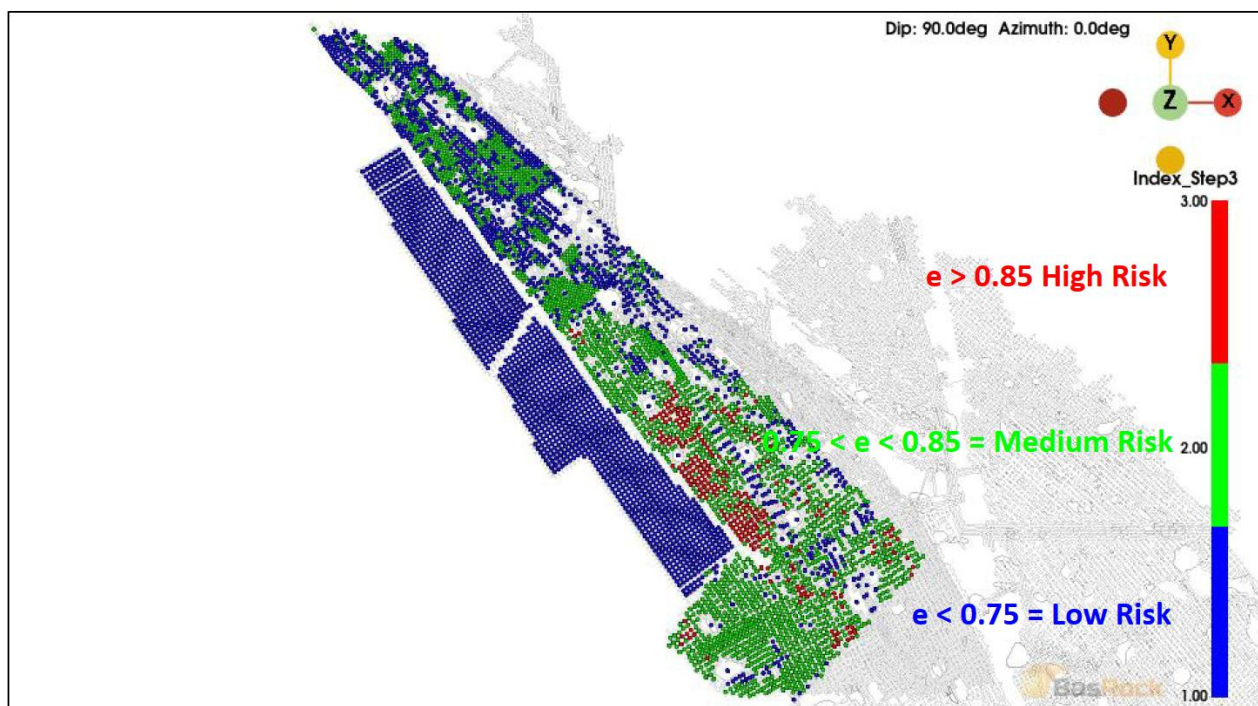


FIGURE 35: CATEGORIZED RISK CLASSIFICATION FOR EACH INDIVIDUAL PILLAR

In terms of subsidence, depending on the ratio of the maximum subsidence to the mining depth, the subsidence profile can be smooth and continuous to stepped with almost vertical sides. The classification (van der Merwe and Madden, 2002) presented in **Table 27** can be used to gain some insight into what to expect.

TABLE 27: CLASSIFICATION OF SUBSIDENCE PROFILES

Class	Sm/H ratio	Description
A	$Sm/H < 0.001$	Barely noticeable, smooth, continuous profile, hair-line cracks
B	$0.001 < Sm/H < 0.005$	Difficult to notice, smooth profile, cracks 1–2 cm wide
C	$0.005 < Sm/H < 0.02$	Noticeable in flat terrain, smooth, cracks 2–10 cm wide, compression ridges 1 to 5 cm high
D	$0.02 < Sm/H < 0.05$	Noticeable in most terrains, visible vertical displacements across cracks, cracks 10 to 50 cm wide, compression ridges 5 to 50 cm high
E	$Sm/H > 0.05$	

The most likely expected surface influence was derived from a 3D finite element numerical model. The expected maximum vertical displacement at the underground stopes is depicted in **Figure 36**. Note that some 4mm of displacement is expected to have occurred in the historic mined stopes (as mined). Maximum expected vertical displacement of around 1mm is expected towards the center of the proposed mining area and reduces as the stoping progresses to the shallower extends.

A similar plot is depicted in **Figure 37** however, for this plot, the vertical displacement that is expected on the surface above the stoping area is plotted. Note that vertical displacement $< 0.5\text{mm}$ is expected in the shallow areas of the proposed mining area. The vertical displacement resulting from the as-mined stopes is expected to be in the region of 2.5mm. Referring to **Table 27**, both these cases are orders of magnitudes below the criteria for Class A and could thus be regarded as insignificant.

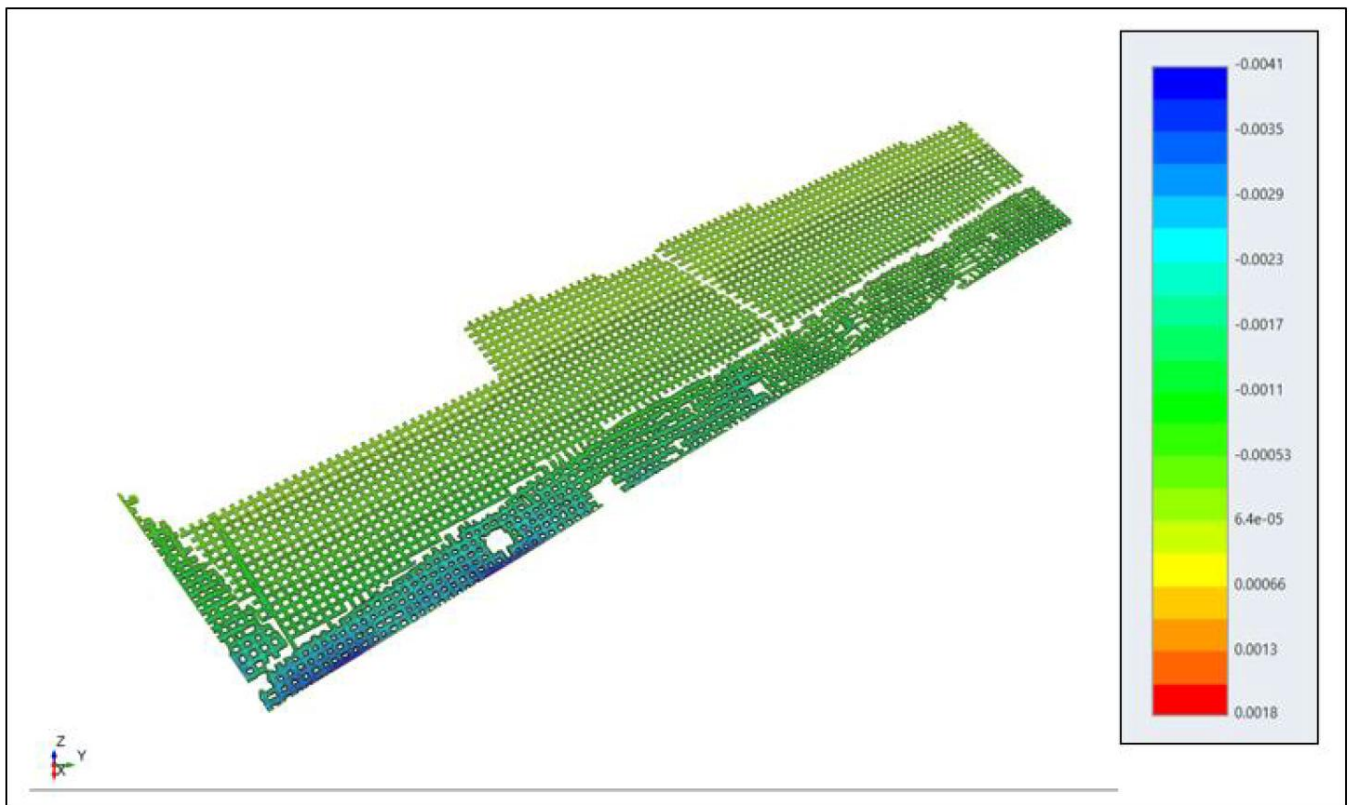


FIGURE 36: MAXIMUM VERTICAL DISPLACEMENT AT THE UNDERGROUND STOPES

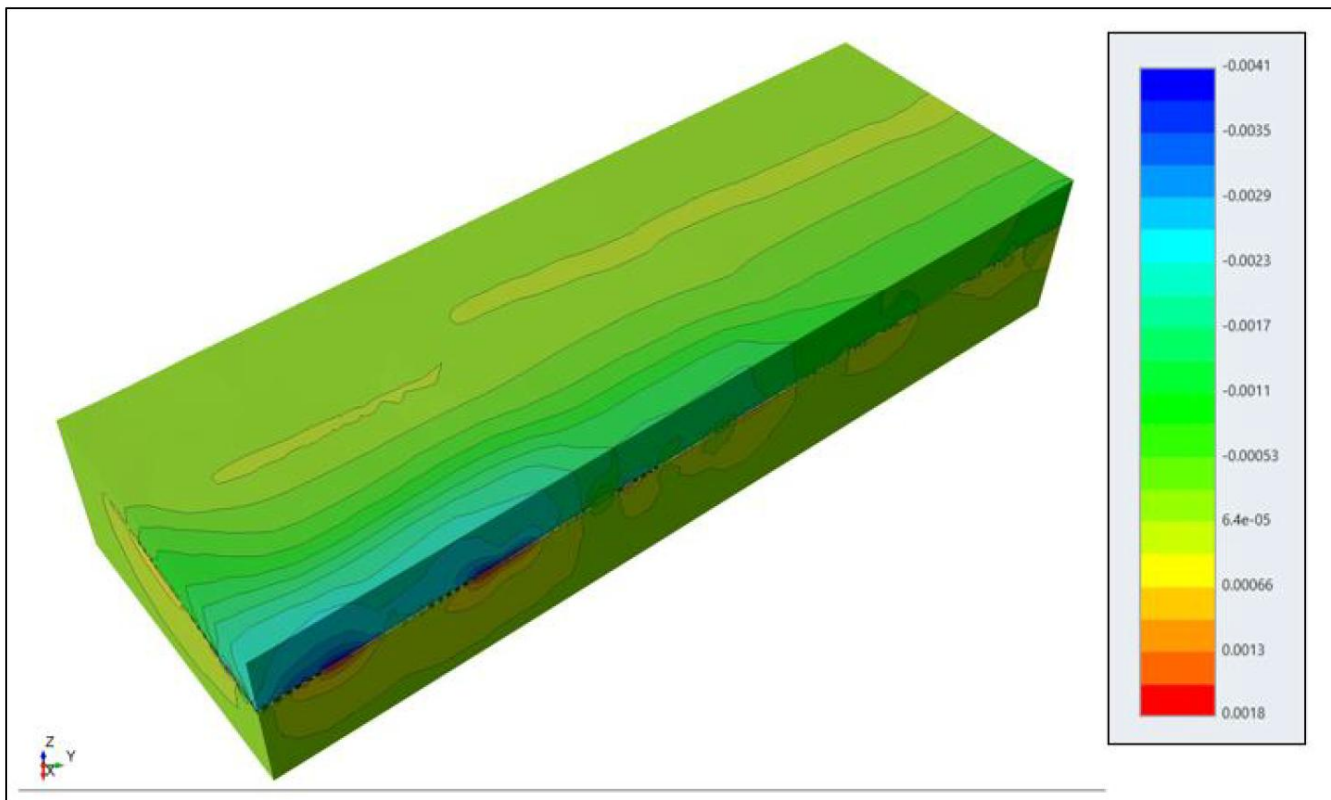


FIGURE 37: MAXIMUM VERTICAL DISPLACEMENT AT THE SURFACE ABOVE THE STOPPING AREA

8.3.6 Groundwater

Aquifer Parameters

Site-specific aquifer parameters were calculated after the pump testing of six (6) of the hydrocensus boreholes. The pump test information is shown in **Table 28** and the calculated aquifer parameters and yield are presented in **Table 29**.

TABLE 28: PUMP TEST INFORMATION (MVB CONSULTING, 2024)

BH ID	Coordinates			Depth (m)	Water Level (m below surface)	Available Drawdown (m)	Constant Rate Test			Recovery Test	
	Longitude	Latitude	Collar Elevation (mamsl)				Test Duration (min)	Pumping Rate (lit/sec)	Drawdown (m)	Test Duration (min)	Recovery (%)
BH6	27.2341	-25.6320	1144.52	46	8.80	37.20	720	1.15	12.28	200	100
BH7	27.2341	-25.6327	1144.17	65	8.00	57.00	720	1.14	32.00	600	86
BH13	27.2322	-25.6316	1147.14	60	10.78	49.22	720	2.27	4.76	700	100
BH14	27.2270	-25.6291	1153.09	20	7.95	12.05	720	1.07	2.31	700	97
BH5	27.2265	-25.6353	1155.00	70	7.89	62.11	720	1.07	5.35	710	92
BH24	27.2302	-25.6297	1149.60	70	8.97	61.03	720	1.45	4.53	700	99

TABLE 29: AQUIFER PARAMETERS AND BOREHOLE YIELD (MVB CONSULTING, 2024)

Borehole	BH6	BH7	BH13	BH14	BH5	BH24
Owner	Rustenburg Steel Construction	Flex Self Storage	Afri Ready Mix	Rustenburg Galvanisers	Allied Crane	SA Breweries
Longitude	27.2341	27.2341	27.2322	27.2270	27.2265	27.2302
Latitude	-25.6320	-25.6327	-25.6316	-25.6291	-25.6353	-25.6297
Depth (m)	46	65	60	20	70	70
Water Level (m below surface)	8.8	8	10.78	7.95	7.89	8.97

Available Drawdown (m)	37.2	57	49.22	12.05	62.11	61.03
Transmissivity (m²/day)	14.01	8.9	31.6	34.9	6.11	49.45
Maximum Yield (Litre / Hour)	10 800	6 120	43 200	13 680	12 600	54 000
Safe Yield (Litre / Hour)	8 100	4 590	32400	10 260	9 450	40 500
Maximum Yield (m³/day)	194.4	110.16	777.6	246.24	226.8	972
Recommended Abstraction (Total Litres / 12-hour cycle)	97 200	55 080	388 800	123 120	113 400	486 000
Recommended Abstraction (m³/day)	97	55	389	123	113	486
Actual Usage (according to owners) (m³/day)	10	10	16	?	5	?

Groundwater Quality Assessment²

The latest groundwater quality in the closest monitoring boreholes is summarised in **Table 30**. The groundwater quality is compared against the Water Use License (WUL) specified limits and in the absence of WUL limits the quality is compared against the DWAF Livestock Watering Guidelines (1996).

The hydrocensus boreholes that were tested were also sampled. The results are shown in **Table 31** and is compared against the WUL limits as well as the SANS 241 (2015) Drinking water standards. The laboratory certificates are attached as Appendix B.

The localities of the Kwezi mine monitoring and hydrocensus boreholes are shown on **Figure 38**.

Kwezi (K5) Shaft Monitoring. There are three boreholes (ATG01, ATG05 and NBH02) monitoring the area down-gradient from the Kwezi (K5) Shaft.

- Borehole NBH02 is clean and none of the parameters exceed the WUL limits.
- Borehole ATG01 is located directly downgradient from K5 Shaft: This borehole shows quite deep groundwater levels as compared to ATG05 and NBH02. Groundwater may be flowing into the underground workings at this point. None of the parameters exceed the guideline limits.
- Borehole ATG05 is located downstream of the shaft coffer dam. It shows good quality and none of the parameters exceed the guideline limits.

K6 Shaft Monitoring. There are four boreholes (AK6 G01, AK6 G05, AK6 G07 and AK6 G09) monitoring the area up- and down-gradient from the Kwezi (K6) Shaft.

- The water quality in all four boreholes is good and none of the parameters exceed the guideline limits.

Six groundwater samples were collected from the hydrocensus boreholes. These boreholes are up-gradient from any Sibanye mining activity.

- The water quality in the hydrocensus boreholes is slightly poorer than the mine monitoring boreholes, indicating contaminant sources within the industrial area.
- Borehole BH5 show elevated concentrations for Electrical Conductivity (EC), Total Dissolved Solids (TDS) and sulphate (SO₄).
- All the hydrocensus boreholes, except BH13, are all elevated in terms of magnesium (Mg).

The chemical character of the water at the sampling points is best described with the aid of the Piper diagram. The Piper diagram is one of the most commonly used techniques to interpret groundwater chemistry data.

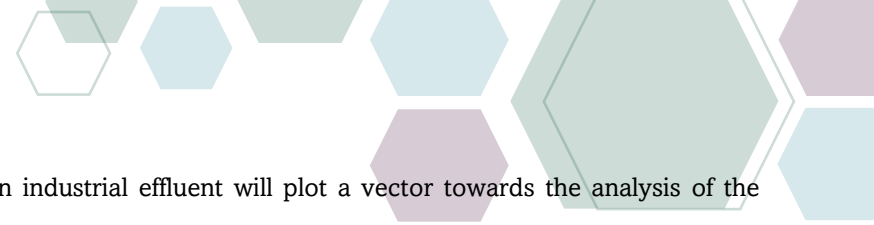
This method proposed the plotting of cations and anions on adjacent trilinear fields with these points then being extrapolated to a central diamond field. Here the chemical character of water, in relation to its environment, could be observed and changes in the quality interpreted. The cation and anion plotting points are derived by computing the percentage equivalents for the main diagnostic cations of Ca, Mg and Na, and anions Cl, SO₄ and HCO₃.

Different waters from different environments always plot in diagnostic areas. The upper half of the diamond normally contains water of static and disordinate regimes, while the middle area normally indicates an area of dissolution and mixing. The lower triangle of this diamond shape indicates an area of dynamic and co-ordinated regimes. Sodium chloride brines normally plot on the right hand corner of the diamond shape while recently recharge water plots on the left-hand corner of the diamond plot. The top corner normally indicates water contaminated with gypsum (mine impact). In general the top half of the diamond contains static waters and other unusual waters high in Mg/Ca Cl₂ and Ca/Mg SO₄. The lower half contains those waters normally found in a dynamic basin environment. The values for mixtures of any two waters in any proportion plot along a line joining their respective points in each of these

² It is very important to understand that a groundwater model (which was used to predict the potential water level drop) is merely a tool that is used to interpret future changes to the aquifer system. This implies that there are always discrepancies associated with groundwater models. A numerical groundwater model is a representation of the real system and is calibrated according to field data.

In this instance the groundwater model was previously developed for the entire mining region and the data that was used consisted of the mine monitoring boreholes. Although there are 153 boreholes to which the model was calibrated (8% deviation), there were no site-specific borehole information available at the time. The closest boreholes are the Kwezi 5 Shaft boreholes that are approximately 1km north-east from the study area.

In view of this, the results from the model should be viewed with good sense based on hydrogeological experience. The model results were nevertheless included as the Geohydrologist (independent specialist) believe that Sibanye-Stillwater should be made aware of this conservative scenario.



diagrams. Water therefore being invaded by an industrial effluent will plot a vector towards the analysis of the invading fluid.

The Piper diagrams for the hydrocensus and Kwezi groundwater monitoring boreholes are shown as **Figure 39**. The mine monitoring boreholes are characterised as Ca-HCO₃ (fresh groundwater) type water. The hydrocensus boreholes are moving towards the Ca-SO₄ type water, which is indicative of impacted water.

.



FIGURE 38: MONITORING AND HYDROCENSUS LOCALITY

TABLE 30: GROUNDWATER CHEMISTRY IN THE KWEZI MONITORING BOREHOLES

BH ID	pH	EC	TDS	Alk.	Cl	SO ₄	NO ₃ -N	NH ₄ -N	PO ₄ -P	F	Ca	Mg	Na	K	Al	Fe	Mn	Cr	Cr ⁶⁺
	pH Units	mS/m	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
RPM WUL 2018	6-9.5	<150			<200	<200	<10			<1	<150	<100	<200						
DWS Livestock 1996			<1000		<1500	<1000	<100			<2	<1000	<500	<2000		<5	<10	<10	<1	<1
Kwezi (K5) Shaft																			
NBH02	8.07	58	392	208	39	45	5.91	1.00	0.04	0.28	37	30.60	36.50	0.85	0.002	0.004	0.001	0.003	0.002
ATG05	7.93	55.8	393	181	36	44	7.42	0.746	0.007	0.23	38.1	32.9	42.3	0.699	0.002	0.004	0.002	0.003	0.002
ATG01	7.25	104	677	506	49	0	0.049	6.78	0.003	0.243	92.3	23.1	102	41.1	0.002	0.004	0.519	0.003	0.002
Kwezi (K6) Shaft																			
AK6 G01	7.80	58	367	276	13	28	0.71	10.80	0.029	0.072	70.6	19.8	21	6.96	0.002	0.004	0.346	0.003	0.002
AK6 G05	7.12	126	721	587	98	0	0.222	35.7	0.005	0.205	68.9	77.6	21.9	6.75	0.002	0.0421	0.411	0.003	0.002
AK6 G07	6.96	87	568	397	60	13	0.08	7.04	0.005	0.202	95.7	56	18.9	4.26	0.002	0.004	0.497	0.003	0.002
AK6 G09	7.30	142	883	638	98	33	0.122	23.9	1.41	0.22	121	96.6	31.7	5.48	0.002	0.004	0.693	0.003	0.002

TABLE 31: GROUNDWATER CHEMISTRY IN TESTED HYDROCENSUS BOREHOLES

Analyses in mg/ℓ (Unless specified otherwise)	RPM WUL 2018	SANS 241 Drinking Water	BH6 (KBH1)	BH7 (KBH2)	BH13 (KBH3)	BH14 (KBH4)	BH5 (KBH5)	BH24 (KBH6)
pH - Value @ 25 °C	6-9.5	≥5 to ≤9.7	7.3	7.5	7.3	7.2	7.2	7.3
Electrical Conductivity in mS/m @ 25°C	<150	≤170	122	123	117	112	196	119
Total Dissolved Solids @ 180°C		≤1 200	802	804	772	744	1 244	722
Total Alkalinity as CaCO ₃			360	348	388	360	572	380
Chloride as Cl	<200	≤300	108	106	80	73	198	102
Sulphate as SO ₄	<200	≤500	124	148	129	129	215	105
Fluoride as F	<1	≤1.5	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate as N	<10	≤11	6.3	4.8	4.7	6.4	6.2	6
Ortho Phosphate as P			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Free and Saline Ammonia as N		≤1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sodium as Na	<200	≤200	27	24	25	25	51	21
Potassium as K			2.2	2.6	0.8	0.8	1.5	0.6
Calcium as Ca	<150		58	63	62	62	107	57
Magnesium as Mg	<100		107	115	99	104	185	115
Aluminium as Al		≤0.3	<0.100	<0.100	<0.100	<0.100	0.146	<0.100
Arsenic as As		≤0.01	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
Barium as Ba		≤0.7	0.033	<0.025	0.049	0.063	0.126	0.053
Boron as B		≤2.4	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Total Chromium as Cr		≤0.05	0.026	<0.025	<0.025	<0.025	<0.025	<0.025
Cobalt as Co			<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Copper as Cu		≤2	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

Analyses in mg/ℓ (Unless specified otherwise)	RPM WUL 2018	SANS 241 Drinking Water	BH6 (KBH1)	BH7 (KBH2)	BH13 (KBH3)	BH14 (KBH4)	BH5 (KBH5)	BH24 (KBH6)
Iron as Fe		≤2	<0.025	<0.025	0.072	<0.025	0.192	<0.025
Lead as Pb		≤0.01	<0.001	<0.001	0.005	<0.001	<0.001	<0.001
Manganese as Mn		≤0.4	<0.025	<0.025	<0.025	<0.025	0.31	<0.025
Mercury as Hg		≤0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel as Ni		≤0.07	<0.025	0.025	<0.025	<0.025	0.03	<0.025
Selenium as Se		≤0.04	<0.001	0.001	<0.001	0.001	<0.001	<0.001
Strontium as Sr			0.262	0.169	0.276	0.29	0.462	0.278
Zinc as Zn		≤5	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025

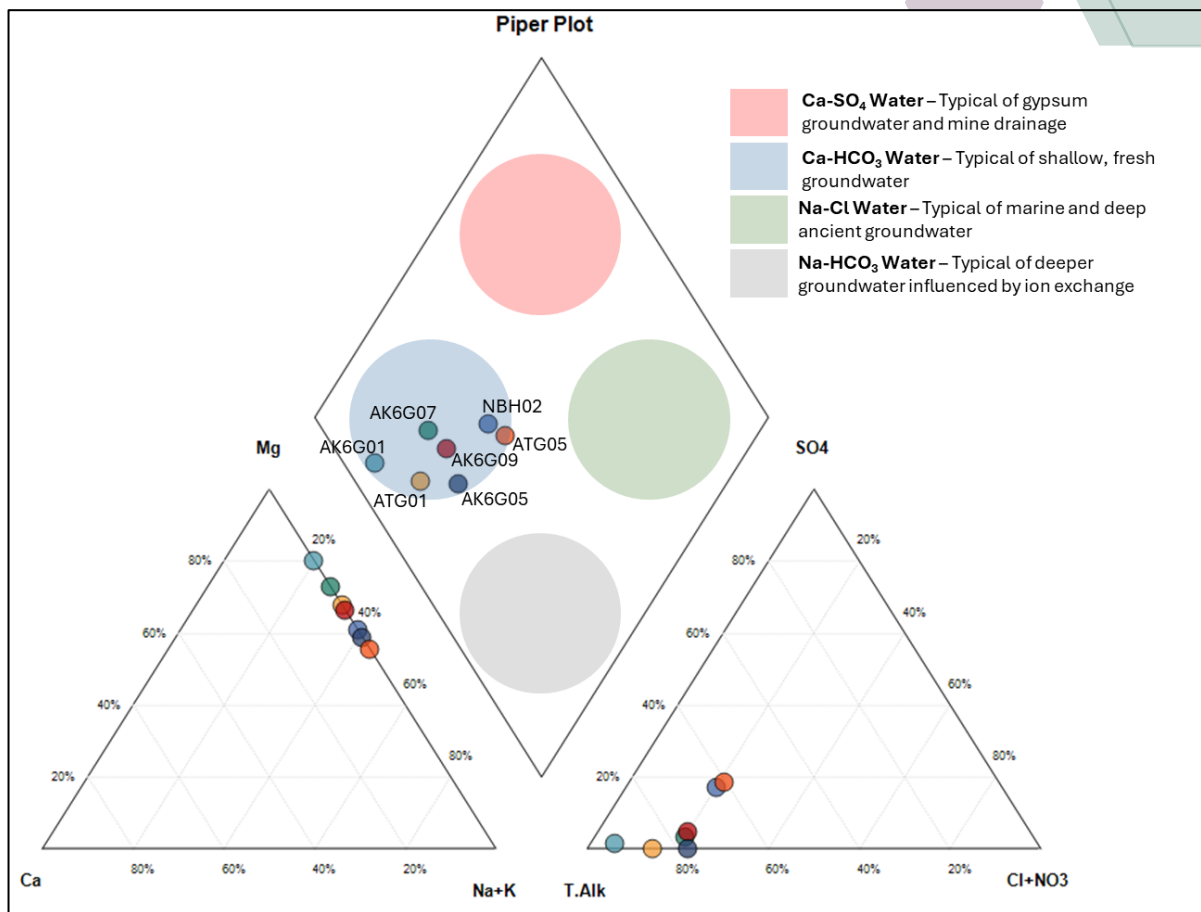


FIGURE 39: PIPER DIAGRAM FOR THE SRPM AQUIFER MONITORING BOREHOLES

Underground mining Environment

The extent of the underground mining on the Merensky and UG2 reefs is shown in **Figure 40** and the 3-dimensional representation of the mined-out area is shown in **Figure 41**.

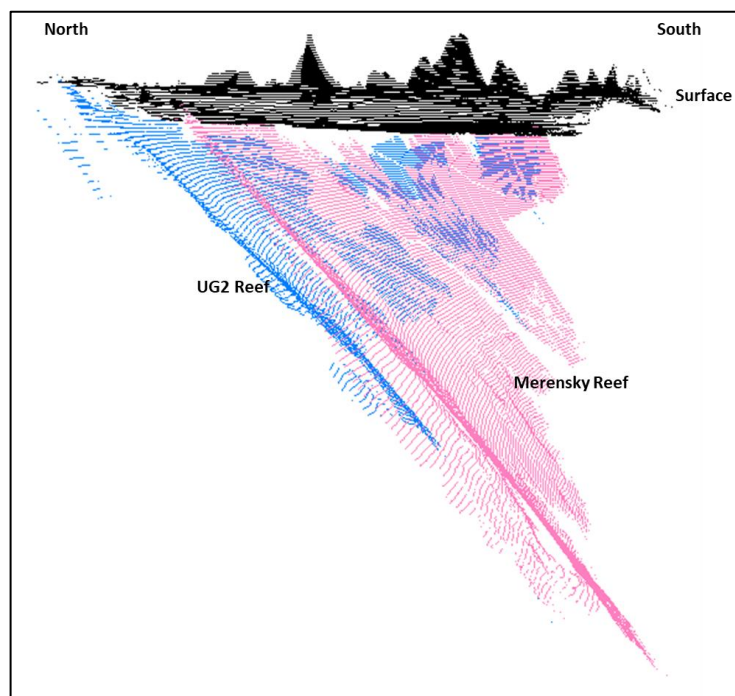


FIGURE 40: 3-DIMENSIONAL MINED OUT MODEL

TABLE 32: MINING ELEVATIONS

Reef	Mining Elevation
Merensky Reef	1 160 mamsl to -180 mbmsl
UG2 Reef	1 210 mamsl to 170 mamsl

The current groundwater inflow into the mines in this region is approximately 3.8 ML/day.

The geochemical risk assessment (GeoDyn, 2021) indicated that the mineral waste is unlikely to leach metal and metalloid contaminants into the groundwater in a post-closure scenario. The geochemical model results for the underground mine voids, indicates that the risk of the development of AMD (Acid Mine Drainage) conditions is negligible. The post-closure underground mine void geochemical system has acid neutralisation capacity, which is far more than the acid production capacity. The quality of the water that will fill the mine void post-closure is therefore expected to be good.

All the shaft collars are above the expected post-closure static groundwater elevation except for Thembelani 2 Shaft, which is 0.6 m below the groundwater elevation. There is therefore a possibility of future mine water decant from this shaft. This elevation of approximately 1 097 mamsl will to some degree control the level to which the mine water level will recover. In the Kwezi extension area, the dewatering cone that could develop may not fully recover if this decant occurs. In the worst-case scenario many of the boreholes that will be dewatered will remain dry after closure. Sealing of the low-lying shafts may be considered, not only to prevent decant, but also to allow the mine water level to rise and the affected boreholes to recover.

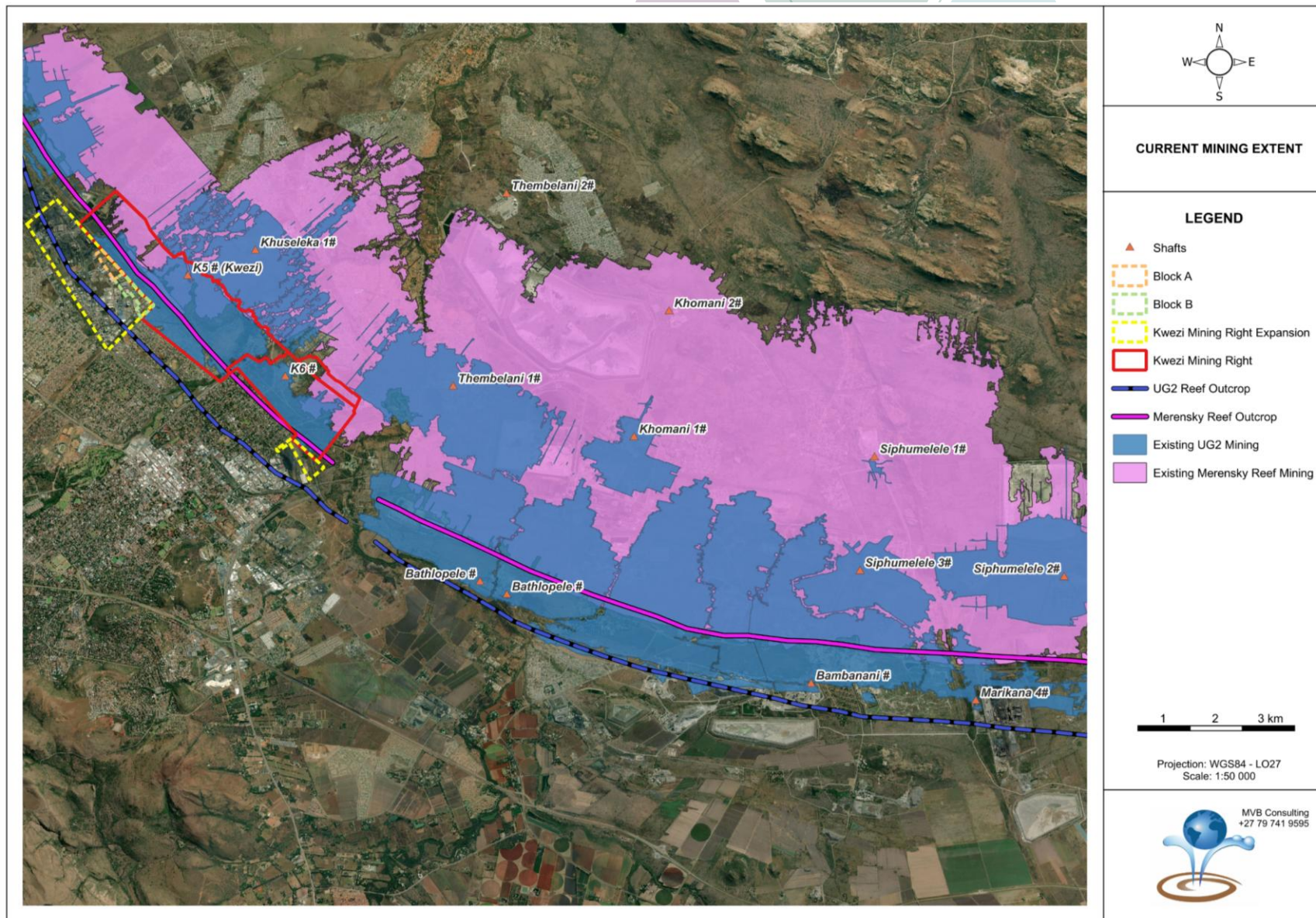


FIGURE 41: UNDERGROUND MINING EXTENT

Numerical Groundwater Model and Risk Assessment

A numerical groundwater model is a useful tool to assess the current and potential future impacts from the project on the groundwater regime. In this instance the potential impacts are:

- Estimated groundwater inflow volumes into the underground workings.
- Impact on the groundwater levels during the operational and post-closure phase of the mine.

The primary risk that the proposed mining extension poses is the risk of dewatering and disruption of private groundwater supply. The hydrocensus identified twenty-five (25) private boreholes in the industrial area to overlying the proposed mining extension.

The numerical model was used to simulate the following:

- Expected groundwater inflow volume into the mining extension.
- The expected groundwater level drawdown as a result of the groundwater inflow.
- The groundwater level recovery post-closure, assuming no decant.

Geohydrological Impacts

The primary risk that the proposed mining extension poses is the risk of dewatering and disruption of private groundwater supply. The hydrocensus identified twenty-five (25) private boreholes in the industrial area to overlying the proposed mining extension.

The numerical model was used to simulate the following:

- Expected groundwater inflow volume into the mining extension.
- The expected groundwater level drawdown as a result of the groundwater inflow.
- The groundwater level recovery post-closure, assuming no decant.

Groundwater Inflow

The modelled groundwater inflow volumes are presented in **Figure 42** and **Figure 43** for Block A and Block B respectively.

The groundwater inflow volumes are as follows:

- Block A Initial Flow: Lower Limit – 703 m³/day; Average – 844 m³/day; Upper Limit – 1 013 m³/day.
- Block A Steady Flow: Lower Limit – 394 m³/day; Average – 473 m³/day; Upper Limit – 567 m³/day.
- Block B Initial Flow: Lower Limit – 1 239 m³/day; Average – 1 486 m³/day; Upper Limit – 1 784 m³/day.
- Block B Steady Flow: Lower Limit – 654 m³/day; Average – 785 m³/day; Upper Limit – 942 m³/day.

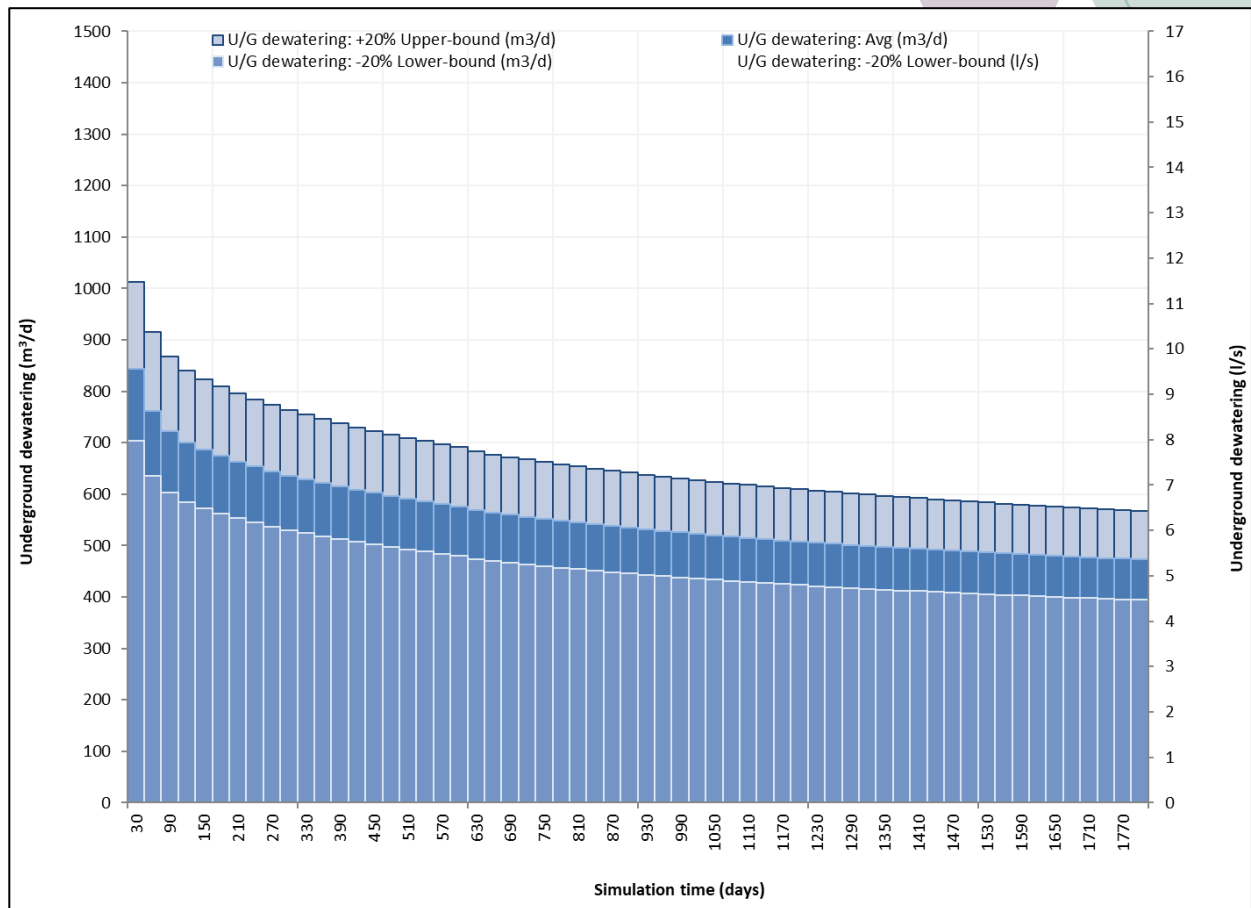


FIGURE 42: ESTIMATED GROUNDWATER INFLOW VOLUME – BLOCK A

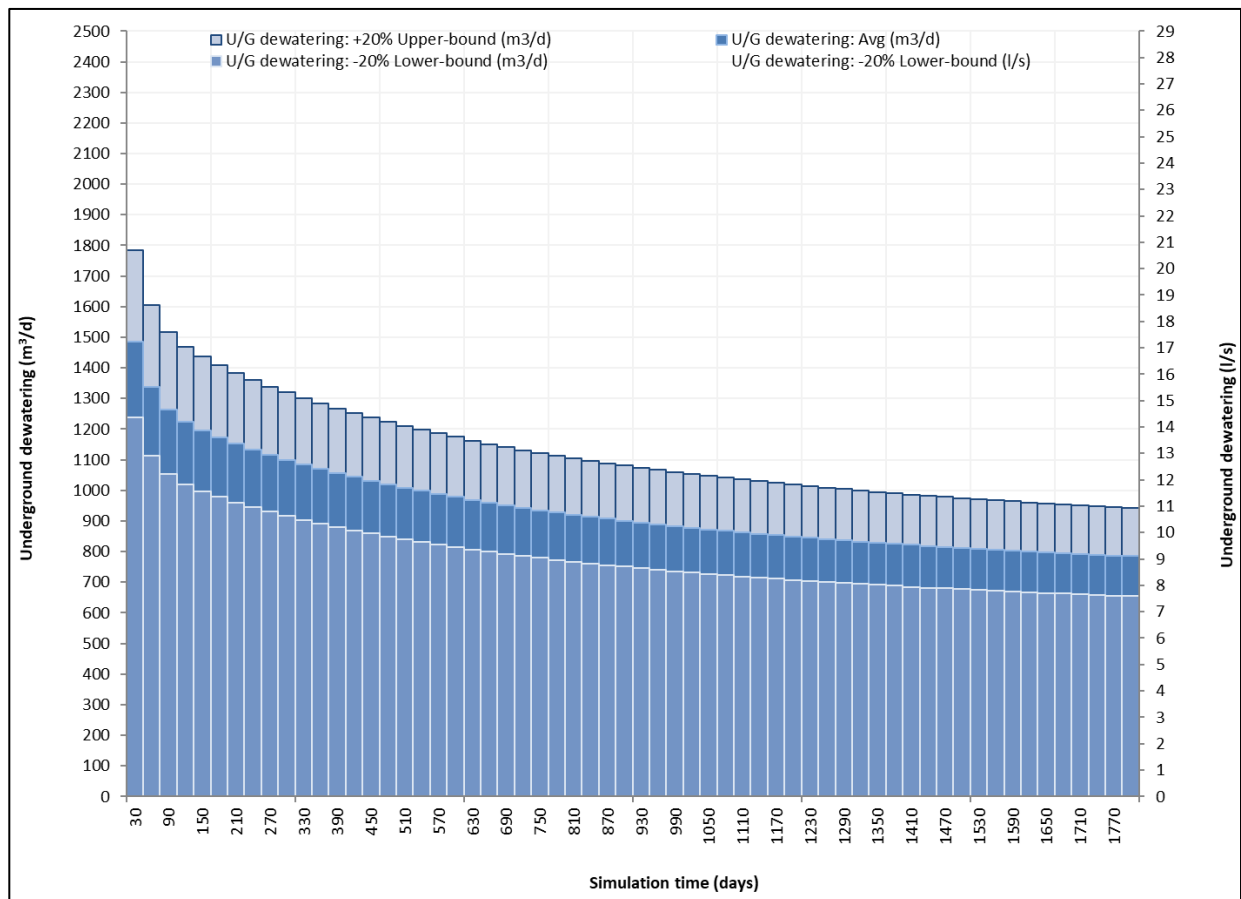


FIGURE 43: ESTIMATED GROUNDWATER INFLOW VOLUME- BLOCK A

Groundwater Level Drawdown and Recovery

The change in groundwater level at the end of an assumed 5-year mining period is shown in **Figure 44**. The groundwater level over the mining blocks is expected to drop to the mining elevation, approximately 60 m. The extent of the impact is within a radius of 1 km from the edge of the mining block. Based on the extent of the simulated groundwater level drop, the risk to the hydrocensus boreholes were assessed (**Table 33**). The boreholes in which the groundwater level can potentially drop below the bottom of the borehole is highlighted in red. This assessment shows that over time many of the boreholes may dry up.

The groundwater level recovery will take approximately 15 years to fully recover post-closure, assuming no decant. The borehole will, however, start to rewater within two years post-closure. **Figure 44** and **Figure 45** shows the groundwater level drawdown and recovery in borehole BH6, which is located within the worst affected area.

TABLE 33: BOREHOLES AFFECTED BY THE LOWERING OF THE GROUNDWATER TABLE (MVB CONSULTING, 2024)

ID	Owner	Depth (m)	Drawdown (m)	Drawdown Elevation (mamsl)	Borehole Bottom Elevation (mamsl)	Waterlevel above / below Borehole (m)
BH1	Euro Steel	25	19.921	1115.48	1124.91	-9.43
BH2	Twin Pack	60	18.962	1113.36	1091.04	22.32
BH3	Mattress & Lounge Corporation	45	22.211	1114.02	1106.23	7.79
BH4	Chemblocks	45	24.305	1113.20	1110.00	3.19
BH5	Allied Crane	70	23.506	1078.92	1085.00	-6.08
BH6	Rustenburg Steel Construction	46	57.396	1073.90	1098.52	-24.63
BH7	Flex Self Storage	65	56.6	1076.44	1079.17	-2.73
BH8	Epol	25	53.552	1084.01	1117.11	-33.10
BH9		25	55.766	1076.49	1117.25	-40.77
BH10	Mmutle Mining Projects	40	58.037	1064.09	1101.68	-37.60
BH11	Khunene Technologies	80	43.342	1081.80	1060.00	21.80
BH12	Khunene Technologies	100	44.422	1078.34	1038.73	39.62
BH13	Afri Readymix	60	53.092	1084.13	1087.14	-3.01
BH14	Rustenburg Galvanisers	50	35.373	1108.91	1103.09	5.83
BH15	Private Owner (Intermine Agencies)	50	0	1127.96	1092.53	35.43
BH16	Steel Services	120	49.84	1089.19	1029.01	60.18
BH17	Q4 Fuel Marolien	45	52.382	1082.22	1100.00	-17.78
BH18	Steel and Pipe	20	25.745	1118.11	1127.68	-9.57
BH20	Glencore	30	47.061	1091.86	1116.97	-25.11
BH21	Glencore	30	45.363	1093.57	1117.01	-23.44
BH22	Glencore	30	47.842	1090.56	1118.15	-27.59
BH23	Glencore	30	49.336	1088.91	1117.07	-28.16
BH24	SAB	70	48.468	1092.16	1079.60	12.56

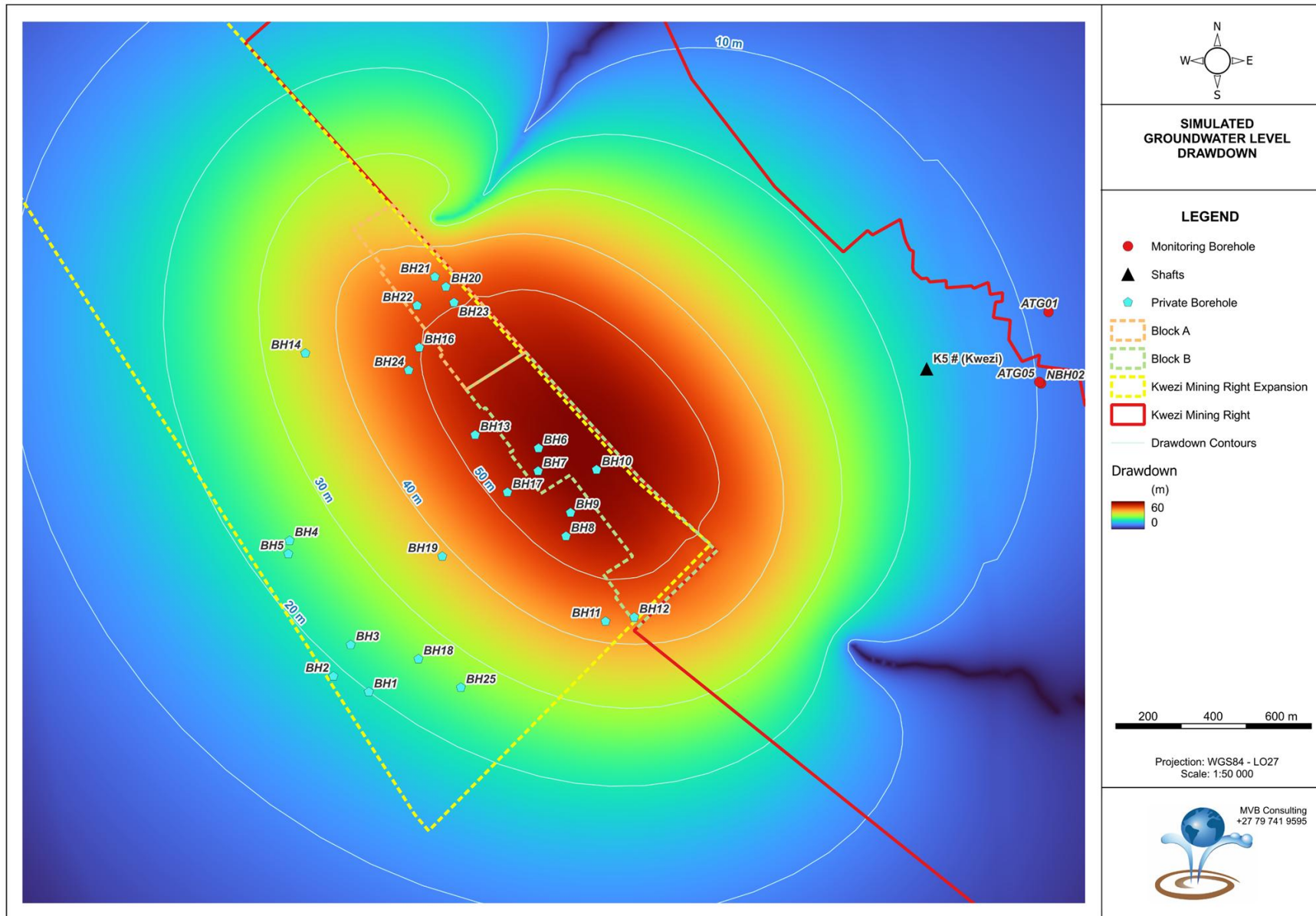


FIGURE 44: SIMULATED GROUNDWATER LEVEL DRAWDOWN WITHIN THE KWEZI MINING EXTENSION (MVB CONSULTING)

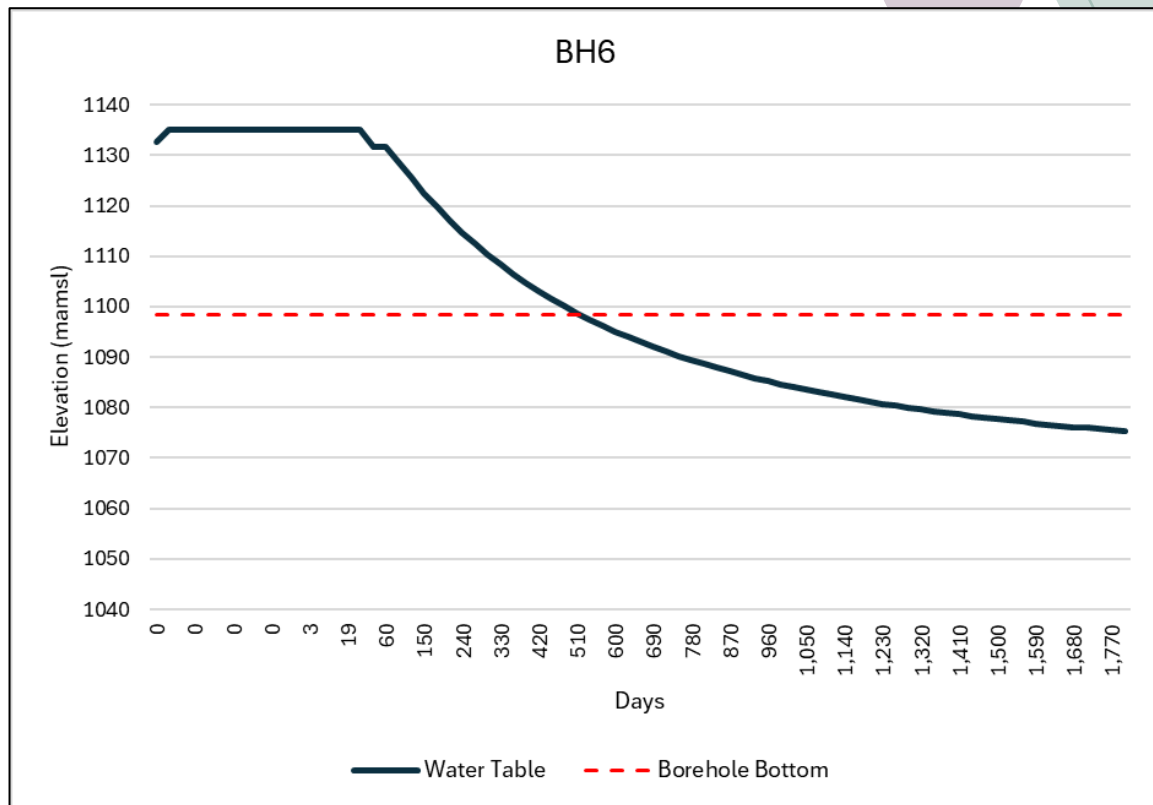


FIGURE 45: SIMULATED GROUNDWATER LEVEL DRAWDOWN IN BOREHOLE BH6

The following impacts have been identified for the operational phase

- The potential lowering of the groundwater level is regarded as the most significant risk associated with this project. It has the potential to impact on private groundwater users, who are solely reliant upon groundwater as their only source of water. If, however, the mitigation measures are implemented this risk can be greatly reduced.
- The potential impact on the groundwater quality is regarded as low and only continued monitoring is recommended.
- The use of heavy machinery can cause various types of spills (especially hydrocarbons) to occur that may potentially infiltrate and contaminate the underlying groundwater system. As no surface infrastructure is proposed and the activity is for underground mining, the impact is seen a low.
- Blasting with nitrate-based explosives will be required in the mining process, the remnants of which are highly soluble in water and will contaminate the material it comes into contact with.

The following impacts have been identified for the Closure phase of the project:]

- The backfilled underground workings will at some point begin to decant as a result of an increase in recharge. The water may potentially be of poor quality and high in nitrate content and will therefore pose a contamination threat to the underlying groundwater.

8.3.7 Socio -economic

Mining is supported by key national, provincial, and local policy and planning documents. The documents indicate that mining is a key economic sector in the North West Province, the Bojanala District Municipality (BDM) and the Rustenburg Local Municipality (RLM). The BDM and RLM IDPs highlights the importance of mining and the need for economic development and job creation. The Kwezi shaft operations is also located within an area that is dominated by mining activities. The expansion of the underground area at the Kwezi operations is therefore supported by key policy and planning documents for the study area. The potential impacts are as follows:

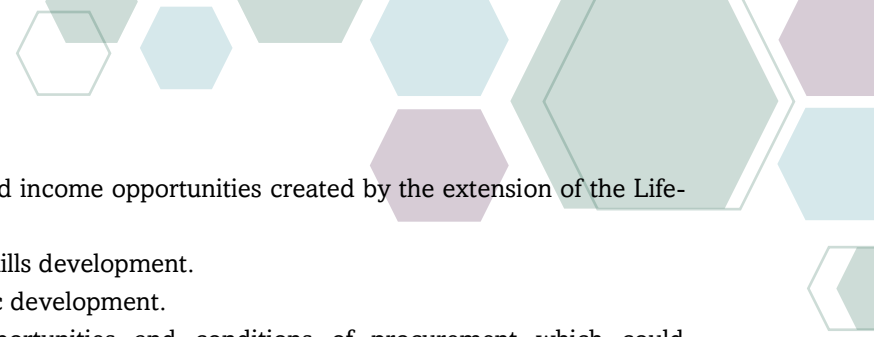
- 
- Benefits resulting from employment and income opportunities created by the extension of the Life-of-Mine of Kwezi Shaft.
 - Benefits associated with training and skills development.
 - Benefits associated with local economic development.
 - Dissatisfaction over employment opportunities and conditions of procurement which could potentially lead to community protests and unrests, as well as conflicts within communities.
 - Loss of employment and business opportunities during the closure phase.

TABLE 34: ASSESSMENT OF IDENTIFIED IMPACTS OF THE PROPOSED PROJECT: 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
Topography																				
Underground mining of Block A and B at Kwezi Shaft	Potential subsidence due to underground mining activities The underground mining activities will remove material from underground by means of bord and pillar mining methods. The removal of the material could potentially lead to surface subsidence.	8	4	1	4	3	3	60	M	Medium	Negative	- Maintain recommended pillar size/safety factor that will ensure that no surface subsidence occurs. - No total pillar extraction mining method to be implemented.	4	3	1	2	2	3	36	L
Soils																				
The proposed expansion of the Kwezi Underground Operations does not constitute of surface infrastructure as the existing shaft area will be used as well as existing surface infrastructure. There are no additional impacts expected on soil resources.																				
Terrestrial biodiversity																				
The proposed expansion of the Kwezi Underground Operations does not constitute of surface infrastructure as the existing shaft area will be used as well as existing surface infrastructure. There are no additional impacts expected on terrestrial biodiversity.																				
Wetlands																				
Operation of the underground mining area related to the undermining of the north eastern CVB wetland.	Potential creation of a cone of depression, which may drain water from the CVB wetland, thus resulting in desiccation of the wetland.	8	4	1	4	3	4	80	MH	Medium	Negative	- Implementation of the mitigation measures as stipulated for groundwater and stability assessment - Water levels need to be strictly managed to ensure that a significant cone of depression impact does not take place.	4	3	1	2	2	3	36	L
Operation of the underground mining area related to the undermining of the north eastern CVB wetland.	Potential destabilisation of the surrounding environment through the extraction of ore and subsequent potential subsidence of the land	8	4	1	4	3	2	40	M	Medium	Negative	Implementation of the mitigation measures as stipulated for groundwater and noise & vibration.	4	3	1	2	2	3	36	L
Groundwater																				

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
Underground mining of Block A and B at Kwezi Shaft - Dewatering of underground mine area	Reduction groundwater levels During opencast and underground mining groundwater flows into the workings, which is then be pumped out. This results in the lowering of the groundwater levels in the vicinity of the mine during the operational phase of the mining operation. The extent of this dewatering cone is important as it can potentially impact on private groundwater users and in extreme situations may cause boreholes to dry up. After mining ceases the groundwater levels are expected to recover and this risk will no longer be applicable.	8	5	2	4	3	4	88	MH	Medium High	Negative	- Sealing of water ingress point by grouting of the fault and dyke geological fractures as to reduce fissure water ingress. - Should existing groundwater users be impacted upon, Sibanye Stillwater should replace the groundwater source by drilling new or deeper boreholes as an alternative water source. - Monitor boreholes for any water level changes together with precipitation as to assess the impacts on the groundwater level and the formation of a cone of depression. This water level monitoring data need to form the baseline data as to determine when existing groundwater sources of existing users require mitigation and replacement. - Existing boreholes from groundwater users should be surveyed and plotted on the mine plan (x,y,z). Pillars should be maintained around boreholes of existing water users that have been drilled deeper than the planned mining block as to protect these boreholes from being destroyed during the mining period. - Additional monitoring boreholes should be installed for the monitoring of water levels as to report on changes in the cone of depression and possible impact on the existing abstraction boreholes. - Prior to the commencement of mining, the hydrocensus must be updated and water levels as well as abstraction volumes recorded to support baseline data and identify additional boreholes. - The Numerical Flow and Contaminant Transport Model (groundwater model) must be updated every two years (in terms of the Life of Mine) with the most recent data and the results thereof shared with the affected users. - The dewatering pipeline and pumping system must be installed with a flow water at strategic places to accurately determine the amount of groundwater inflow into the underground mine workings. - The establishment of an Environmental Monitoring Committee with the potentially affected landowners. Quarterly meetings to be held, whereby the groundwater monitoring (quality and quantity) results are presented and discussed.	4	2	2	2	3	2	26	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
Underground Mining and backfilling of waste rock material to mined out underground areas	Deterioration of groundwater quality Change of the ambient water quality due to backfilling of waste rock material in mine-out underground workings. Waste rock material from Kwezi Shaft has been declassified from a Type 3 to a Type 4 waste and Exemption from NWA GN704 has been applied for as part of the WULA. It is unlikely that leachate from the waste rock material will detrimentally impact the groundwater quality.	4	4	2	1	2	2	26	L	Medium	Negative	- Quarterly monitoring of drilled boreholes for groundwater quality aspects will be undertaken. - Dewatering qualities must be measured at the transfer and pollution control dams. - The results of the water quality monitoring will be used to verify the rate of movement of the groundwater pollution plume.	2	2	1	1	1	2	14	L
Mining Activities	The use of heavy machinery can cause various types of spills (especially hydrocarbons) to occur that may potentially infiltrate and contaminate the underlying groundwater system. As no surface infrastructure is proposed and the activity is for underground mining, the impact is seen a low.	4	4	2	1	2	2	26	L	Medium	Negative	- Machinery should be well maintained and properly operated. - Spills should be cleaned up immediately, and the relevant authorities notified in the event of a significant spill. - Contaminated material must either be stored on-site in an approved waste disposal area or removed by credible contractors.	2	2	1	1	1	2	14	L
Blast and Vibration																				

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
Underground mining of Block A and B at Kwezi Shaft	Ground vibration: Impact on surface infrastructure	4	3	1	2	1	4	44	M	Low	Negative	The proposed mine geometry is fit for purpose, with the following adjustments required: - Update the mine plan to exclude any mining < 35.0mbs as a minimum - Limit advance per blast to 3.0m up to a minimum depth below surface of 50.0m (considering a factor of safety of around 1.4) - Limit advance per blast to a maximum of 2.0m between 35.0mbs and 50.0ms. - Ensure that primary support caters for a fall-out thickness equal to the distance up to the triplets (established to be 2.0m in the area of interest) plus an additional length to cater for adequate anchorage into the solid rock. - Ensure that a monitoring and instrumentation program is developed that is specific to the shallow mining area that considers at least: - The condition of the hanging wall parallel contacts. - Increase or decrease of water flow/presence. - Rock mass conditions, and suitability of support to cater for conditions. - Ground vibration (including frequencies) and air-blast. - High resolution monitoring of surface deformation for comparison to expected vertical displacement. - Third party consultation and monitoring should be considered for all ground vibration monitoring work.	2	3	1	2	1	4	36	L
Underground Mining	Potential ground water impacts due to surface subsidence	6	3	2	2	3	1	16		Low	Negative	- Follow recommended pillar geometry and mining span guidelines - Follow recommended support guidelines - Continuous vibration and surface subsidence monitoring	6	3	2	2	3	1	16	
Underground Mining	Potential surface erosion impacts due to surface subsidence	6	3	2	2	3	1	16		Low	Negative		6	3	2	2	3	2	16	
Air Quality																				
The proposed expansion of the Kwezi Underground Operations does not constitute of surface infrastructure as the existing shaft area will be used as well as existing surface infrastructure. There are no additional impacts expected on 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
Heritage																				
It is the opinion of the heritage consultant that there are no known sites, features or objects of cultural heritage significance that would be compromised in the event of any subsidence occurring as a result of the underground mining. No impacts on heritage resources are expected.																				
Social																				
Underground mining of Block A and B at Kwezi Shaft	Dissatisfaction over employment opportunities and conditions of procurement which could potentially lead to community protests and unrests, as well as conflicts within communities	8	3	2	2	2	3	51	M	Low	Negative	- Before the commencement of the expansion activities, Mine management should establish links with the Local community to share information and ideas about the proposed expansion. - Develop a clear and concise employment policy prioritizing local employment and communicate this through established communication protocols	4	4	2	1	1	3	36	L
Underground mining of Block A and B at Kwezi Shaft	Benefits resulting from employment and income opportunities created by the extension of the Life-of-Mine of Kwezi Shaft The Kwezi Shaft Operations provide employment and a secure income which in turn provide many socio-economic benefits to employees and their dependents, including: Improved material wealth and standard of living; - Enhanced potential to invest in and improve access to social services such as education, health services, etc. (which may be provided directly by the company to employees and/or employees may now have the funds to pay for these services); and, - Employment and training of unskilled workers facilitates skills development and improves the future employment prospects of such workers.	4	2	2	2	1	3	33	L	Low	Positive	- Where feasible, efforts should be made to ensure that the Sibanye Stillwater employment protocols are met whereby the existing workforce will remain as the proposed project is for an expansion. - Where feasible a training and skills development programmes for local workers should be initiated prior to the initiation of the construction phase. - The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. - Implement management and enhancement measures as per the SLP	6	2	2	2	1	4	52	M

TABLE 35: ASSESSMENT OF IDENTIFIED IMPACTS OF THE PROPOSED PROJECT: 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
Topography																				
No impact on Topography is expected during the closure phase of the project.																				
Soils																				
The proposed expansion of the Kwezi Underground Operations does not constitute of surface infrastructure as the existing shaft area will be used as well as existing surface infrastructure. There are no additional impacts expected on soil resources.																				
Terrestrial biodiversity																				
The proposed expansion of the Kwezi Underground Operations does not constitute of surface infrastructure as the existing shaft area will be used as well as existing surface infrastructure. There are no additional impacts expected on terrestrial biodiversity.																				
Wetlands																				
Post closure management activities	Contamination of water within the receiving environment, and subsequent reduction in water quality (increase in salts and specific contaminants of concern and reduced pH);	8	5	2	3	3	4	84	MH	Moderate	Negative	- Implementation of the mitigation measures as stipulated for groundwater and noise & vibration. - Water levels need to be strictly managed to ensure they are kept below any decant level while ensuring that a significant cone of depression impact does not take place.	4	3	1	2	2	3	36	L
Groundwater																				
Underground Mining and backfilling of waste rock material to mined out underground areas	Deterioration of groundwater quality Change of the ambient water quality due to backfilled underground areas with of waste rock material. Waste rock material from Kwezi Shaft has been declassified from a Type 3 to a Type 4 waste and Exemption from NWA GN704 has been applied for as part of the WULA. It is unlikely that leachate from the waste rock material will detrimentally impact the groundwater quality.	4	4	2	1	2	2	26	L	Medium	Negative	- Monitoring of drilled boreholes for groundwater level and quality aspects will be undertaken. - Dewatering qualities must be measured at the transfer and pollution control dams. - The results of the water quality monitoring shall be used to verify the rate of movement of the groundwater pollution plume. - The numerical model will be calibrated using such data and different management and rehabilitation options will be evaluated.	2	2	1	1	1	2	14	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
Re-watering of the mine workings	Water quality impacts from the underground mine rewatering	2	3	1	2	2	2	20	L	Low	Negative	- After closure, groundwater will rebound during a period of 10-15 years, and the underground mine void will fill with fissure water. The potential for decant of water at surface may impact water quality of the surface water resource should poor-quality water be present. Post closure water quality impacts must be confirmed through the development of a 3-dimensional flood model to increase the confidence levels of the following: - Based on the updated geological information gathered during mining update the groundwater inflow mechanisms and inflow rates - Through predictive modelling predict the time it will take for the groundwater to rebound a flood / fill the void. - Through predictive modelling simulate the expected mine water quality over the long term post flooding. - Confirm the potential for long term decant post closure as well as the predicted location of the decant points/zone. - Confirmation of the expected decant quality and volumes. - Predictive modelling should allow for different closure or partial closure scenarios.								
Post closure decant of groundwater	Deterioration of groundwater quality as a result of post closure decant	4	5	1	4	4	4	72	M	Low	Negative		2	5	1	1	3	2	24	L
Groundwater abstraction	Potential over abstraction from groundwater dewatering of the aquifer	4	2	2	2	3	2	26	L	Low	Negative		2	2	1	2	2	2	18	
Air Quality																				
The proposed expansion of the Kwezi Underground Operations does not constitute of surface infrastructure as the existing shaft area will be used as well as existing surface infrastructure. There are no additional impacts expected on Air Quality.																				
Noise and Vibration																				
No impact on Noise and Vibration is expected during the closure phase of the project.																				
Heritage																				
It is the opinion of the heritage consultant that there are no known sites, features or objects of cultural heritage significance that would be compromised in the event of any subsidence occurring as a result of the underground mining. No impacts on heritage resources are expected.																				
Social																				
Closure of Kwezi Shaft	Loss of employment and enterprise development opportunities due to closure of Kwezi Shaft 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	- Implement the Social and Labour Plan Commitments with regards to decommissioning and closure. - The Final Rehabilitation and Closure Plan to take into consideration the needs of the community as it related to the end land use. - Implement strict access control to the site.	4	4	2	1	1	3	36	L



ENVIRONMENTAL MANAGEMENT PROGRAMME

9. ENVIRONMENTAL MANAGEMENT PROGRAMME

9.1 Objective of the Environmental Management Programme Report

An “*Environmental Management Programme*” (“EMPr”) is a plan or programme that sets out guidelines that describe how activities that have or could have an adverse impact on the environment, will be mitigated, controlled, and monitored and subsequently achieve a required operational and/or end state.

The purpose of the EMPr is to provide for preventative, corrective and best practice measures to ensure that activities are undertaken in an environmentally responsible manner and that such activities are sustainable in the long term.

The primary objectives of the EMPr, include, but are not limited to the following:

- Describe actions that, when implemented, will achieve mitigation of environmental impacts, or result in approved management of activities thereby reducing the probability of impacts occurring.
- Define organisational and administrative arrangements for environmental management and monitoring, including defining the responsibilities of staff and co-ordination, liaison and reporting procedures.
- Ensuring that discussions are held with the site supervision staff, regarding pro-active environmental management, such that potential problems can be identified, and mitigation measures adopted prior to any work being carried out.
- Define the procedures to be followed as to ensure environmental control, in the event of pollution occurring that may require actions.

9.2 Implementation of the EMPr

The implementation of the EMPr with specific reference to the identified mitigation measures will lie with the On-Site Environmental Officer.

The ***On-Site Environmental Officer*** (Highest level of control) on site will ultimately be responsible for overseeing the Compliance Monitoring on site. During the operational phase of the development, the On-Site Environmental Officer will be ultimately responsible to:

- Ensure continuously workshopping of the EMPr commitments with the site to ensure full understanding of responsibilities and actions to ensure compliance.
- Setting aside a budget for maintenance.
- Ensure that allocated responsible resources maintain facilities and infrastructure in good working order to effectively fulfil its intended purpose and to prevent negative environmental impacts.
- Immediately remedy any aspects that contribute to negative environmental impacts.

TABLE 36: ENVIRONMENTAL MANAGEMENT PROGRAMME

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)
Topography		
Potential subsidence due to underground mining activities The underground mining activities will remove material from underground by means of bord and pillar mining methods. The removal of the material could potentially lead to surface subsidence.	Underground mining of Block A and B at Kwezi Shaft	Mitigation Objective: - To limit impacts on drainage and the aesthetic quality of the environment due to changes in the topography. - Rehabilitating of topography to landscape that is visually acceptable. Operational Phase: - Maintain recommended pillar size/safety factor that will ensure that no surface subsidence occurs. - Total pillar extraction mining method not to be implemented.
Surface Water		
Operation of the underground mining area related to the undermining of the north eastern CVB wetland. Operation of the underground mining area related to the undermining of the north eastern CVB wetland.	Potential creation of a cone of depression, which may drain water from the CVB wetland, thus resulting in desiccation of the wetland. Potential destabilisation of the surrounding environment through the extraction of ore and subsequent potential subsidence of the land	Mitigation Objective: - Surface water resource protection through: - National Water Act (Act 36 of 1998) GN704 Regulation Compliance (dirty/clean water separation management). - Effective general & hazardous waste management. - Effective chemical & hydrocarbon management. - Protection of catchment yield. - Effective water demand management. Operational and Closure Phase: - Implementation of the mitigation measures as stipulated for groundwater and noise & vibration. - Water levels need to be strictly managed to ensure that a cone of depression impact does not take place. - Development (if not already in place), update (if in place) and implementation of a site-specific Stormwater Management Plan/Procedure which meets the requirements of the National Water Act (Act 36 of 1998) GN704 Regulations inclusive but not limited to: - The design and implementation of effective clean and dirty water separation systems on site. - The design and implementation of suitable barrier systems for dirty water conveyance and storage facilities in accordance with the requirements of the National Environmental Management Waste Act, (Act 59 of 2008), Waste Act Norms and Standards and as approved through the design requirement of the Department of Water and Sanitation (approved Design Drawings) in the Water Use Licence approval process. - The design and implementation of the minimum design requirements to adhere to the capacity requirements for dirty water containment facilities in terms of GN704. - The design and implementation of suitable energy dissipating structure where clean storm water enters the natural receiving water resource. - Aimed at the protection of topsoil stockpiles aimed at curbing soil erosion and siltation - The site-specific Stormwater Management Plan/Procedure should take into consideration when facilities were approved (under which legislation) - The site-specific Stormwater Management Plan/Procedure should take into consideration the approved technical design of the facilities (according to which existing and new facilities should adhere to) - Development (if not already in place), update (if in place) and implementation of a site-specific suitably designed Surface Water Quality Monitoring Programme (including Biomonitoring (Inclusive but limited to the latest South African Scoring System (SASS),

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)
		Habitat Integrity Index (HII) and Riparian Vegetation Assessment)) which meets the requirements of the National Water Act (Act 36 of 1998) and approved Water Use Licences. • Development (if not already in place), update (if in place) and implementation of a site-specific Waste (General and Hazardous) Management Plan/Procedure • Development (if not already in place), update (if in place) and implementation of a site-specific Dangerous Goods and Hazardous Substances Storage and Handling Management Plan/Procedure aimed at the protection of soils and watercourses against spills and leaks. • Development (if not already in place), update (if in place) and implementation of a site-specific Chemical & Hydrocarbon Spill Procedure which: ○ Sets forth an Emergency Protocol for Surface Water Contamination. ○ Sets forth clean-up and protection of soils against accident and incidents. • Development (if not already in place), update (if in place) and implementation of a site-specific Vehicle and Machinery Maintenance and Management Plan/Procedure which: ○ Ensures maintenance is undertaken to prevent spills and leaks (from maintenance related activities, pipelines, vehicles, and electrical reticulation), performance abnormalities and/or failures. All Phases: • Where possible above ground chemical/hazardous storage tanks and containers should be designed, constructed, and maintained with adequate secondary containment measures. • Maintenance of vehicles and machinery shall only be undertaken in dedicated workshop areas which have been constructed with adequate pollution containment measures. • Where possible developments should be designed and constructed to ensure maximum effective diversion of clean water to the environment, minimal surface water runoff contamination and effective maximum containment of dirty water runoff. • The site to implement a water management hierarchy of avoid, reuse, recycle as far as practically possible. • Developments, equipment, and activities to remain outside of the Regulated Zones of watercourses unless specifically authorised to be there under the National Environmental Management Act, 1998 (Act 107 of 1998), the National Water Act (Act 36 of 1998) and GN704 Regulations. • The development (if not in place), update (if in place) and implementation of awareness & training on this subject matter, EMPr objectives and commitments/mitigation measures to all permanent employees, contractors and visitors (where deemed necessary). * Note all documentation (Plan/Procedure) should be updated <u>when and if required</u> and should take into consideration the inclusion of new developments, changes to existing developments and the most-up-to date relevant specialist studies, guidelines and legislation governing its management from the date of being promulgated.
Groundwater		
Lowering of groundwater levels Deterioration of groundwater quality Groundwater contamination due to hydrocarbon spillages	Underground mining of Block A and B at Kwezi Shaft - Dewatering of underground mine area.	Mitigation Objective: • Implementation of Water Conservation and Water Demand Management measures ○ Groundwater resource protection through: ▪ National Water Act (Act 36 of 1998) GN704 Regulation Compliance (dirty/clean water separation management). ▪ Effective general & hazardous waste management.

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)
	Underground Mining and backfilling of waste rock material to mined out underground areas.	- Effective chemical & hydrocarbon management. - Protection of groundwater quality. - Protection of groundwater yield (quantity). Planning Please - SRPM to compile a Monitoring and Management Plan which shall be discussed with the potentially affected landowner owners prior to the undertaking of mining activities Operational Phase: - Sealing of water ingress point by grouting of the fault and dyke geological fractures as to reduce fissure water ingress. - Should existing groundwater users be impacted upon, Sibanye Stillwater should replace the groundwater source by drilling new or deeper boreholes as an alternative water source. - Monitor boreholes for any water level changes together with precipitation as to assess the impacts on the groundwater level and the formation of a cone of depression. This water level monitoring data need to form the baseline data as to determine when existing groundwater sources of existing users require mitigation and replacement. - Existing boreholes from groundwater users should be surveyed and plotted on the mine plan (x,y,z). Pillars should be maintained around boreholes of existing water users that have been drilled deeper than the planned mining block as to protect these boreholes from being destroyed during the mining period. - Additional monitoring boreholes should be installed for the monitoring of water levels as to report on changes in the cone of depression and possible impact on the existing abstraction boreholes. - Prior to the commencement of mining, the hydrocensus must be updated and water levels as well as abstraction volumes recorded to support baseline data and identify additional boreholes. - The Numerical Flow and Contaminant Transport Model (groundwater model) must be updated every two years (in terms of the Life of Mine) with the most recent data and the results thereof shared with the affected users. - The dewatering pipeline and pumping system must be installed with a flow water at strategic places to accurately determine the amount of groundwater inflow into the underground mine workings. - The establishment of an Environmental Monitoring Committee with the potentially affected landowners. Quarterly meetings to be held, whereby the groundwater monitoring (quality and quantity) results are presented and discussed. - Quarterly monitoring of drilled boreholes for groundwater quality aspects will be undertaken. - Dewatering qualities must be measured at the transfer and pollution control dams. - The results of the water quality monitoring will be used to verify the rate of movement of the groundwater pollution plume. - Machinery should be well maintained and properly operated. - Spills should be cleaned up immediately, and the relevant authorities notified in the event of a significant spill. - Contaminated material must either be stored on-site in an approved waste disposal area or removed by credible contractors. - The applicant must be responsible for compliance with the provisions for duly of care and remediation of environmental damage in accordance with Section 28 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended. This principle requires that the responsibility for cleaning up pollution lies with the polluter. The polluter is responsible for remedying or rehabilitating the resulting damage and bears the financial implications thereof. The responsibility of the polluter will not only be limited to the environment but may also include socio-cultural resources and harm to human health and well-being, Rustenburg Local Municipality Integrated Environmental Management Policy. (RLM IEM Policy 2023).

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)
		Decommissioning & Closure Phase: - After closure, groundwater will rebound during a period of 10-15 years, and the underground mine void will fill with fissure water. The potential for decant of water at surface may impact water quality of the surface water resource should poor-quality water be present. Post closure water quality impacts must be confirmed through the development of a 3-dimensional flood model to increase the confidence levels of the following: - Based on the updated geological information gathered during mining update the groundwater inflow mechanisms and inflow rates - Through predictive modelling predict the time it will take for the groundwater to rebound a flood / fill the void. - Through predictive modelling simulate the expected mine water quality over the long term post flooding. - Confirm the potential for long term decant post closure as well as the predicted location of the decant points/zone. - Confirmation of the expected decant quality and volumes. Predictive modelling should allow for different closure or partial closure scenarios. All Phases: - All EMP recommended mitigation measures as applicable for Surface Water Management must be adhered to. - The site to implement a water management hierarchy of avoid, reuse, recycle as far as practically possible. - The development (if not in place), update (if in place) and implementation of awareness & training on this subject matter, EMP objectives and commitments to all permanent employees, contractors and visitors (where deemed necessary). * Note all documentation (Plan/Procedure) should be updated <u>when and if required</u> and should take into consideration the inclusion of new developments, changes to existing developments and the most-up-to date relevant specialist studies, guidelines and legislation governing its management from the date of being promulgated.
Blast, Vibration and Stability		
Ground vibration: Impact on surface infrastructure	Underground mining of Block A and B at Kwezi Shaft	Mitigation Objective: - Minimization and management of safety risks associated with the undertaking of blasting activities. Planning Phase - SRPM to compile a Monitoring and Management Plan which shall be discussed with the potentially affected landowner owners prior to the undertaking of mining activities Operational Phase: The proposed mine geometry is fit for purpose, with the following adjustments required: - Update the mine plan to exclude any mining < 35.0mbs as a minimum - Limit advance per blast to 3.0m up to a minimum depth below surface of 50.0m (considering a factor of safety of around 1.4) - Limit advance per blast to a maximum of 2.0m between 35.0mbs and 50.0ms. - Ensure that primary support caters for a fall-out thickness equal to the distance up to the triplets (established to be 2.0m in the area of interest) plus an additional length to cater for adequate anchorage into the solid rock. - Ensure that a monitoring and instrumentation program is developed that is specific to the shallow mining area that considers at least: - The condition of the hanging wall parallel contacts.

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)
		○ Increase or decrease of water flow/presence. ○ Rock mass conditions, and suitability of support to cater for conditions. ○ Ground vibration (including frequencies) and air-blast. ○ High resolution monitoring of surface deformation for comparison to expected vertical displacement. • Third party consultation and monitoring should be considered for all ground vibration and air blast monitoring work. • Development (if not already in place), update (if in place) and implementation of a Blast Management Plan. • Placement of vibration monitoring equipment within the study area • Continuous vibration and surface subsidence monitoring • Follow recommended pillar geometry and mining span guidelines • Follow recommended support guidelines * Note all documentation (Plan/Procedure) should be updated <u>when and if required</u> and should take into consideration the inclusion of new developments, changes to existing developments and the most-up-to date relevant specialist studies, guidelines and legislation governing its management from the date of being promulgated.
Cultural Heritage Resources		
Destruction/disturbance of cultural heritage resources due to subsidence	Underground Mining	Mitigation Objective: • Cultural heritage resource protection through: ○ Through effective identification, avoidance and mitigation of cultural heritage resources. All Phases: • Continuous implementation of an awareness programme to ensure that permanent employees are equipped to recognize cultural heritage resources. • Continuous workshoping of the "Chance Find Procedure" to ensure protocol implementation is embedded. • Ensuring that any destruction, removal or relocation of cultural heritage resources are undertaken under the correct legislative and social consultation process. • Ensuring that cultural norms and standards are adhered to where feasibly and practically possible • 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA DAU (bmotsodisa@sahra.org.za) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offence in terms of section 51(1)e of the NHRA and item 5 of the Schedule. • 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA DAU (bmotsodisa@sahra.org.za) must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with a section of the NHRA is an offence in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • 38(4)e – The following conditions apply regarding the appointment of specialists: If heritage resources are uncovered during the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA *Note all documentation (Plan/Procedure) should be updated <u>when and if required</u> and should take into consideration the inclusion of new developments, changes to existing developments and the most-up-to date relevant specialist studies, guidelines and legislation governing its management from the date of being promulgated.
Socio-economic		

POTENTIAL ENVIRONMENTAL IMPACT	ACTIVITY	ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)
Dissatisfaction over employment opportunities and conditions of procurement which could potentially lead to community protests and unrests, as well as conflicts within communities Benefits resulting from employment and income opportunities created by the extension of the Life-of-Mine of Kwezi Shaft Loss of employment and enterprise development opportunities due to closure of Kwezi Shaft		Mitigation Objective: • Management of doorstep community expectations and understanding (job opportunities, job opportunity timeframes, project context, project related impacts, community health & safety). • Management of affected doorstep communities (project related impacts). • Realization of social benefits that meet doorstep community needs.
		Operational Phase: • Before the commencement of the expansion activities, Mine management should establish links with the Local community to share information and ideas about the proposed expansion. • Develop a clear and concise employment policy prioritizing local employment and communicate this through established communication protocols. • Where reasonable and practical the Kwezi Operations should appoint local contractors • Where feasible, efforts should be made to employ local contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria. • Before the construction phase commences, the proponent should meet with representatives from the local Traditional Councils (TAs) to discuss and identify measures to enhance opportunities for local employment. This should include setting targets for local employment, specifically for low and semi-skilled work categories. • Where feasible a training and skills development programmes for local workers should be initiated prior to the initiation of the construction phase. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. • Implement management and enhancement measures as per the SLP Closure Phase: • Implement the Social and Labour Plan Commitments with regards to decommissioning and closure. • The Final Rehabilitation and Closure Plan to take into consideration the needs of the community as it related to the end land use. • Implement strict access control to the site.



MONITORING AND REPORTING

10. MONITORING AND REPORTING

The Environmental Impact Assessment (“EIA”) Regulations of 2014 (amended in 2017) as promulgated in terms of NEMA requires compliance auditing of Environmental Authorisations (“EA”), Record of Decision’s (“RoD”), EMPr’s and Closure Plans (“CP”), with the results to be submitted to the Competent Authority (“CA”) at intervals as indicated in the Environmental Authorisation.

10.1 Environmental Awareness Training

The following Environmental Awareness Training will be implemented by SRPM in order to inform employees and contractors of the environmental risk that may result from their work, or the risk of their interaction with the sensitive environment. The training will be conducted as part of the induction process for all new employees (including contractors) that will perform work in terms of the proposed activities.

The environmental awareness training will aim to:

- Promote general environmental awareness as well as awareness specific to the project.
- Inform personnel about the availability and importance of adherence to the EMPr, Environmental
- Authorization as well as any other permits or licenses issued for the project.

The environmental awareness training programme will include:

- Induction of all personnel in a language and method most suitable.
- Signing of an attendance register and declaration of ensuring environmental protection.

Topics that will be included in the induction include:

- What is the environment and why must it be protected?
- What are the environmental sensitivities of the area in which activities are being undertaken?
- How construction activities can adversely impact of the environment?
- What are the mitigation measures for adverse impacts?
- What is the social responsibility of all site employees during construction?
- How should environmental incidents be recorded?

All new employees will be inducted by the Construction Manager prior to commencing with work on site. Proof of the induction will be kept. Refresher environmental awareness training will be conducted as and when the need arises. An example of this is when there are repeated non-compliances. The Construction Manager will ensure daily toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area / habitat in which they are working, etc. Awareness posters and pamphlets must be provided to create environmental awareness throughout the site.

10.2 Performance Assessment and Reporting

Unless otherwise instructed by the Competent Authority (DMPR previously known as 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 DMPR. External environmental compliance audits on the EMPr will be undertaken biennial (once every two years) by an independent EAP, and a copy of the external audit report will be submitted to the DMPR.

The assessment should be a systematic evaluation of activities onsite and aims to determine:

- The level of compliance with the conditions of the EA and EMP, as well as the extent to which the avoidance, management and mitigation measures provided for in the EMP achieve the objectives and outcomes of the EMP;
- Identify shortcomings in the EMP;
- The evaluation of management commitments within the EMP that might require reconsideration or additional mitigation measures in light of current management practices;

- The evaluation and identification of management commitments that may not be appropriate to activities undertaken on site; and
- Identify the need for any changes to the avoidance, management and mitigation measures provided for in the EMP.

The Performance Assessment must include:

- Review of existing EA and EMP reports.
- Review of performance in relation to existing management commitments as documented in the approved EMP; and
- Site inspection and general environmental audit.

10.3 Record Keeping

All records related to the implementation of this EMP must be kept together in an office where it is safe and can be retrieved easily. These records should be kept for two years and should at any time be available for scrutiny by any relevant authorities.

10.4 Incident Reporting

An environmental incident is an unwanted event that has an actual or potential (near-hit) negative impact on the environment, affecting the quality of air, land or water, fauna, or flora, and / or causing stakeholder concern. A causal link must be able to be made between an operational activity and the event.

Environmental Incidents is monitored to establish the following:

- Which repeat incidents occur;
- Has the incident been investigated, and the root cause been identified;
- Effectiveness of implementation of preventative and corrective actions; and
- To monitor trends to check the effectiveness of the mitigation measures.

10.5 Emergency Procedures

The purpose of this procedure is to:

- document the mechanism by which potential emergency situations and accidents will be identified during the operational phase that can have an impact on the environment; and
- provide guidelines on the response to actual emergency situations and accidents to prevent or mitigate associated environmental impacts that may occur.

An environmental emergency situation or accident is an unexpected, sudden occurrence with the potential to endanger people or seriously damage the environment, either immediately or with a delayed effect.

Potential emergencies shall be identified, and response plans shall be developed for all identified emergencies. These include the following:

- how potential emergency situations and accidents will be identified;
- a guideline for developing emergency preparedness and response procedures, for use by the contractors to address specific emergencies, stating how to respond to potential emergencies that might have an impact on the environment;
- the process to be followed in the case where an emergency situation or accident occurs;
- when potential emergency situations or accidents and their associated procedures will be reviewed; and
- the frequency at which the procedures shall be tested.

10.6 Environmental Monitoring

10.6.1 Groundwater Monitoring

Sibanye-Stillwater will continue with an ongoing environmental monitoring programme for its Kwezi Shaft operation. Specifically, groundwater will be monitored.

TABLE 37: GROUNDWATER COMPONENTS TO BE MONITORED

Aspect	Component	Data collection frequency	Reporting frequency
Groundwater	Water quality	Quarterly monitoring	Quarterly reporting
	Borehole level	Monthly	Monthly reporting

Existing groundwater monitoring points are shown in **Table 38** and **Figure 46**.

TABLE 38: CURRENT GROUNDWATER MONITORING POINTS

Site Name	Y co-ord	X co-ord	Site description	Comments
ATG01	-25.62790	27.24979	Downgradient of Kwezi Shaft area (north-east)	
ATG02	-25.62888	27.25138	Downgradient of Kwezi Shaft area (east)	
ATG04	-25.62663	27.24448	Upgradient of Kwezi Shaft area (north-west)	Borehole demolished
ATG05	-25.63008	27.24946	Downgradient of Kwezi Shaft area (south-east)	



FIGURE 46: LOCATION OF KWEZI SHAFT GROUNDWATER MONITORING POINTS

Water quality parameters to be monitored are shown in **Table 39**.

TABLE 39: WATER QUALITY PARAMETERS FOR MONITORING

Parameter	Unit
pH	-
Electrical conductivity	mS/m
Total Dissolved Solids	mg/ℓ
Calcium	mg/ℓ
Magnesium	mg/ℓ
Sodium	mg/ℓ
Potassium	mg/ℓ
Alkalinity	mg/ℓ
Chloride	mg/ℓ
Sulphate	mg/ℓ
Nitrate as N	mg/ℓ
Fluoride	mg/ℓ
Aluminium	mg/ℓ
Iron	mg/ℓ
Manganese	mg/ℓ
Ammonia	mg/ℓ
Total Hardness	mg/ℓ
Nitrite as N	mg/ℓ
Phosphate	mg/ℓ
Boron	mg/ℓ
Cadmium	mg/ℓ
Chrome	mg/ℓ
Copper	mg/ℓ
Nickle	mg/ℓ
Lead	mg/ℓ
Zinc	mg/ℓ

In addition to the monitoring points shown in **Figure 46**, it is recommended that SRPM drill five operational monitoring boreholes within the potentially affected area to monitor the groundwater levels. The recommended borehole positions are shown in **Figure 47**. It must be a dedicated monitoring borehole to prevent pumping water levels from being measured. The groundwater levels in these boreholes should be monitored monthly and the monitoring data should be communicated to the property owners.



FIGURE 47: RECOMMENDED MONITORING BOREHOLES

10.6.2 Blast and Vibration Monitoring

Ground monitoring for ground movement and subsidence will be undertaken. The recommended monitoring points are shown in **Figure 48**.



FIGURE 48: GROUND MONITORING POINTS

10.7 Environmental Management and Monitoring Plan

A Focus Group Meeting was held on the 6 November 2024, with landowners that provided comments on the proposed expansion. During the meeting comments and concerns were raised on groundwater levels and quality and blast & vibration as well as subsidence. SRPM therefore committed to compile an Environmental Management and Monitoring Plan.

The purpose of the document is to outline the mitigation and monitoring plans for the project. The issues raised by Interested and Affected Parties (IAPs) have been taken into consideration during the development of the mitigation action plan in order to ensure environmental impacts are avoided and minimised.

Summary of the Groundwater Management and Monitoring

The management measures as provided in the plan includes the following:

- Seal and grout the mine and ensure water does not flow into mine workings
- Leave pillars around the boreholes to protect the boreholes
- Replace affected boreholes
- Investigate water supply alternatives

The monitoring action plan is as follows:

- Sibanye-Stillwater to monitor water levels to ensure management actions should levels drop

- Water quality to be monitored in all the identified boreholes

The Environmental Management and Monitoring Plan has been attached to **Appendix G**.

Summary of Blast and Vibration Monitors

Mitigation Action Plan

- Follow recommended pillar and geometry mining span guidelines
- Follow recommended support guidelines
- Ensure vibration levels do not exceed guideline limits and achieve maximum vibration levels of 6 mm/s
- Limit the length of round to 2.0m max at depths less than 50 m.
- Employ 8mm delay between shotholes.

Monitoring Action Plan

-
- Conduct house surveys to establish the baseline
- Install continuous monitors in four points around the relevant areas
- Monitor vibration levels continuously



FINANCIAL PROVISION

11. CLOSURE AND FINANCIAL PROVISION

11.1 Key Closure Objectives

Sibanye-Stillwater has an existing Final Rehabilitation, Decommissioning and Mine Closure Plan for its PSA Platinum Mining Operations. The PSA Platinum Mining Operations consist of two geographically separate areas, namely the Kwezi/K6 Shaft area located immediately north east of the town of Rustenburg, and the 4 Shaft/Bambanani Shaft/K2 concentrator around 15km south east of Rustenburg.

The following key closure objectives have been formulated to guide the closure measures to be implemented on site towards achieving the above closure vision (Golder, 2021):

- Creating a safe, physically stable rehabilitated landscape that limits long-term erosion potential and environmental degradation
- Sustaining long term catchment yield and water quality
- Focussing on establishing a functional post-mining landscape that supports the surrounding land uses and is aligned with regional planning
- Interconnecting rehabilitated landscapes with surrounding regionally biologically diverse areas
- Encouraging, where appropriate, the re-instatement of terrestrial and aquatic wetland biodiversity over time
- Creating opportunities for alternative post-mining livelihoods by aligning to regional planning

11.2 Financial Provision

The closure liability for Kwezi Shaft is provided in the form of a bank guarantee. A closure liability assessment is conducted annually whereby the bank guarantee is adjusted accordingly. A Financial Guarantee is in place for the entire Mining Right Area. The guaranteed sum is R214 704 579.72. As the expansion is underground, no additional infrastructure is required on surface which means that all existing infrastructure (as per the Kwezi Property inventory) remains. The potential environmental impacts are assessed annually, and remediation costs (if needed) are adjusted based on the outcome of the assessment.

Important Note:

A pre-application meeting was held on 31 May 2024 with Mr Desmond Makamu from the DMPR previously known as the DMRE, whereby the project proposal was discussed with the Department, of which the discussions included highlighting the fact that a Financial Provision and Rehabilitation Plan has not been commissioned as part of the application process as the application is for the expansion of the Kwezi Underground Mining Area and no surface infrastructure is proposed. The DMPR advised the submission of the Financial Provision is a requirement in terms Section 24P of the National Environmental Management Act (Act 107 of 1998) (NEMA) and that the non-submission will require a formal motivation from the EAP. The detailed motivated has been included as **Appendix E**.



CONCLUSION AND RECOMMENDATIONS

12. CONCLUSION AND RECOMMENDATIONS

12.1 Professional Opinion of the EAP and Impact Statement

SRPM Kwezi Shaft is an existing operational mine undertaking mining activities on a respective property through a Mining Right that has been issued by the DMRE (*now known as the DMPR*). It is the intention of the SRPM to undertake a Basic Assessment Process in support of the proposed expansion of the Kwezi Underground mining area through the inclusion of the UG2 Shallows blocks (Blocks A and B). No surface infrastructure is proposed as part of this application, as the existing Kwezi Shaft Infrastructure will be used.

This Basic Assessment has provided a comprehensive assessment of the potential impacts associated with the proposed expansion. Where impacts were found to be potentially significant, various mitigation measures to manage and monitor the impacts of the proposed project have been proposed. A number of potential medium to medium high impacts have been identified that are associated with the construction and operational phases of the proposed activities. Risks of special mention relate to the impacts on groundwater, wetlands, ground vibration and stability. The Rustenburg Local Municipality is currently facing a severe and escalating water crises. This crisis is exacerbated by the regular water restrictions imposed by Rand Water and daily water interruptions from Magalies Water, further impacting the quality of life for residents. The landowners and land occupiers within the study area are therefore reliant on groundwater supply. It is important that SRPM therefore adhere to the mitigation measures as provided in the geohydrological assessment together to regular monitoring of the groundwater levels. Should for some reason disruption in supply if foreseen, alternative water supply will be required to be provided to the affected landowners/land occupiers.

Other than this Basic Assessment, the mine will be required to apply for a Water Use License Application for the undermining of the identified wetland and the backfilling of the underground workings.

Taking into consideration the findings of the environmental impact assessment, the project benefits outweigh the potential negative impacts provided that mitigation measures are applied effectively including the required permits. The employment opportunities afforded at the SRPM Kwezi Shaft already contribute towards maintaining and improving employment opportunities within the Rustenburg Local Municipality. Such will have a positive spin off on the region and contribute to the provincial Gross Value Added (CVA). Mine revenue will facilitate fund allocation to local economic development through the implementation of projects identified in the Social and Labour Plan. Local contractors and businesses will benefit from supplying the mine with goods and services.

It is the EAP's opinion that, given the already disturbed state of the environment in which the project will be located (due to existing mining activities), these impacts can be mitigated to prevent the environmental integrity from being compromised. Although the proposed project will have a cumulative impact on the already impacted surrounding environment based on all information that was captured in this report, the proposed expansion will not lead to unacceptable/unmanageable impacts or fatal flaws and should be considered plausible in the framework of NEMA.

In terms of collectively considering ecological, social and economic impacts the economic development is justifiable, and also considering the social benefit, the EAP is of opinion that this project should be authorised.

Should the DMPR grant authorization for this proposed project, it should be subject to the following conditions:

- The project should remain in full compliance with the requirements of the EMPr and with all regulatory requirements.
- The EMPr should be implemented by qualified environmental personnel who have the competence and credibility to interpret the requirements of the Basic Assessment and the EMPr. Such persons must be issued with a written mandate by mine management to provide guidance and instructions to employees and contractors.
- Adhere to all monitoring requirements.
- Increase the groundwater monitoring points for the monitoring of groundwater levels and quality
- Preventing the groundwater from entering the mine will negate all the resulting impacts, if it can be successfully implemented. The recommended approach is to seal any water intersection that may be encountered during the mining process. It is recommended to drill cover boreholes ahead of the mining face to identify any water-bearing features. If encountered, these should be sealed using chemical grout. The idea is to seal only the area around the mining and not extensively so as not to seal the boreholes.

- Sealing of the low-lying shafts not only to prevent decant, but also to allow the mine water level to rise and the affected boreholes to recover.
- Leaving pillars around the deeper boreholes to protect the borehole.
- If any borehole is damaged through the mining process it is recommended that such a borehole be replaced with a shallower borehole. However, all the boreholes that may be affected by mining may potentially dry up due to the lowering of the groundwater level. Boreholes that are outside the mining blocks can be drilled deeper if and when the groundwater level drops.
- Water supply from an alternative source to affected owners may be considered. The most likely alternative water source is a well field outside the affected area. This will have to be investigated to find the most suitable site.
- The establishment of an Environmental Monitoring Committee with the potentially affected landowners, whereby monitoring results is presented on a quarterly basis
- SRPM to compile a Monitoring and Management Plan which shall be discussed with the potentially affected landowner owners prior to the undertaking of mining activities
- A Water Use License must be obtained prior to any activities that trigger water uses undertaken on site.
- In terms of the protection of features with cultural and heritage significance, a chance find procedure to be implemented by the operations.
- Accurate blasting management plans and blasting charge calculations should be developed and/or calculated to ensure that good blasts are achieved.

12.2 Period which Environmental Authorisation is required

It is recommended that the period of validity for the Environmental Authorisation be stipulated as the maximum allowance of ten (10) years post Environmental Authorisation.

REFERENCES

- Agreenco. (2015). *Biodiversity Management and Action Plan: Marikana Divisions*. Pretoria: Agreenco Environmental Projects (Pty) Ltd.
- Metaoblue. (2024). *Simulated historical climate & weather data for Rustenburg*. Retrieved from Meteoblue.com: https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/rustenburg_south-africa_958724
- North West Planning Commission. (2013). *Provincial Development Plan*. Rustenburg: North West Planning Commission.
- Parsons, R. (1995). *South African Aquifer System Management Classification*. Water Research Commission. Retrieved from <https://www.wrc.org.za/wp-content/uploads/mdocs/KV%2077-95.pdf>
- Pistorius, J. (2012). *A survey of heritage Resources in the Lonmin Marikana Mine lease area in the Brits (Madibeng) and Rustenburg (Bafokeng) Districts in the North-West Province*. . Pretoria: Beyond Heritage.
- topographic-map. (2024). *Rustenburg topographic map*. Retrieved from topographic-map: <https://en-za.topographic-map.com/map-8v3gt/Rustenburg/>
- OHMS (2024) Kroondal West – vibration, Blast and Stability Assessment
- Scientific Aquatic Services (2024) Freshwater Assessment as Part of the Environmental and Water Use Authorisation Process for the Proposed Additional Areas Associated with the Underground Mining Activities at the Kwezi Shaft
- Zimpande Research Collaborative (Pty) Ltd (Zimpande). (2024). *Hydropedological Opinion as part of the Water Use License (WUL) Application Process, for the proposed Kwezi Underground Mine Expansion in Rustenburg, North West Province*. Reference Number: ZRD 24-4017. August 2024.



APPENDIX A: CV OF THE EAP



APPENDIX B: DFFE SCREENING REPORTS



APPENDIX C: SPECIALIST STUDIES



APPENDIX C1: HERITAGE IMPACT ASSESSMENT



APPENDIX C2: WETLAND ASSESSMENT



APPENDIX C3: HYDROPEDOLOGICAL ASESSMENT



APPENDIX C4: GROUNDWATER ASESSMENT



APPENDIX C5: BLAST AND STABILITY ASSESSMENT



APPENDIX D: PUBLIC PARTICIPATION



APPENDIX D1: STAKEHOLDER DATABASE



APPENDIX D2: PRE-APPLICATION MEETING WITH THE DMRE



APPENDIX D3: SITE NOTICES



APPENDIX D4: BACKGROUND INFORMATION DOCUMENT



APPENDIX D5: PROOF OF NOTIFICATION



APPENDIX D6: KNOCK AND DROP REGISTER



APPENDIX D7: NOTIFICATION LETTER



APPENDIX D8: REGISTERED MAIL



APPENDIX D9: FOCUS GROUP MEETING- SAB



APPENDIX D10: FOCUS GROUP MEETING- STAKEHOLDERS



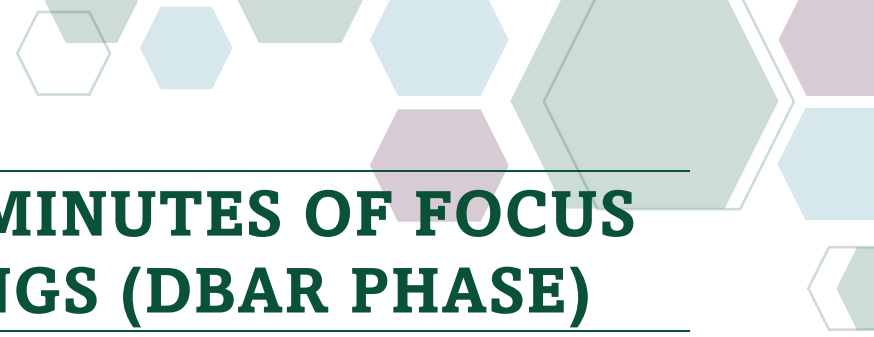
APPENDIX D11: COMMENTS AND RESPONSE REPORT



APPENDIX D12: COMMENTS RECEIVED



APPENDIX D13: NEWSPAPER AVERT



APPENDIX D14: MINUTES OF FOCUS GROUP MEETINGS (DBAR PHASE)



APPENDIX D15 RESPONSES PROVIDED



APPENDIX D16 COMMENTARY

AUTHORITY COMMENTS



APPENDIX D17 DBAR NOTIFICATION



APPENDIX E: FINANCIAL PROVISION MOTIVATION



APPENDIX F: GN704 MOTIVATION



APPENDIX G: ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN
