ALIWAL QUARRY
ERF 2928 (A PORTION OF ERF 1) & A PORTION OF PORTION 5 OF THE FARM MELK SPRUIT NO 12, WALTER SISULU MUNICIPAL AREA, EASTERN CAPE PROVINCE

ENVIRONMENTAL MANAGEMENT PROGRAMME

NOVEMBER 2025

DMPR REFERENCE NUMBER	**EC 30/5/1/2/2/0215 MR & EC0017MR/102**
DOCUMENT VERSION	**Revision 02**

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EXECUTIVE SUMMARY

Aliwal Dolerite Quarry (Pty) Ltd holds a mining right (EC 30/5/1/2/2/0215 MR) to mine dolerite over 55.5166 ha of Erf No 2928 (a portion of Erf 1), near Maletswai in the Walter Sisulu Municipality of the Eastern Cape. The Mining Right (MR) is valid until 24 March 2040, with the possibility of renewal. The Department of Mineral and Petroleum Resources (DMPR) approved a Section 102 application (EC0017MR/102) in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) in December 2022 to expand the mining footprint. This approval increased the mining footprint of 55.5166 ha with an additional 6.7824 ha that extends over a portion of Portion 5 of the farm Melk Spruit No 12.

The 2025 environmental performance audit concluded that the 2011 Environmental Management Programme (EMPR) of Aliwal Quarry does not fully comply with Appendix 4 of the EIA Regulations (GNR 982 of 2014) (as amended). The Quarry has since made various changes and/or improvements on site, and management identified the need to amend/update the EMPR to adequately manage and/or mitigate the environmental impacts associated with the activity as well as ensure legal compliance. The Quarry would also like to consolidate the 2011 EMPR and 2018 EMPR, that was approved as part of the Section 102 amendment application.

This 2025 Amended EMPR will replace the 2011 and 2018 EMPRs, upon approval by the DMPR, and will serve as the guiding document for all environmental management aspects of the mine. The competent authority will evaluate the amended EMPR in terms of Regulation 35 of GNR 982, ensuring it provides sufficient measures for the avoidance, mitigation, and management of environmental impacts while allowing for continued compliance with legal requirements and industry best practices.

Aliwal Dolerite Quarry (Pty) Ltd remains committed to sustainable mining practices, environmental stewardship, and responsible resource extraction that balances economic development with environmental protection and community well-being.

LIST OF ABBREVIATIONS

ASTM	American Standard Test Method
BGIS	Biodiversity GIS
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DMPR	Department of Mineral and Petroleum Resources
DoL	Department of Labour
DoT	Department of Transport
DPW	Department of Public Works
DRDAR	Department of Rural Development and Agrarian Reform
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
ECO	Environmental Control Officer
EIA Regulations	Environmental Impact Assessment Regulations, 2014 (as amended)
EMPR	Environmental Management Programme
EPA	Environmental Performance Assessment
GNR	Government Notice
GPS	Global Positioning System
HSA	Hazardous Substances Act, 1973 (Act No. 15 of 1973)
I&AP's	Interested and Affected Parties
IUCN	International Union of Conservation of Nature
JGDM	Joe Gqabi District Municipality
MHSA	Mine Health and Safety Act, 1996 (Act No 29 of 1996)
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MR	Mining Right
MR Holder	Aliwal Dolerite Quarry (Pty) Ltd
MSDS	Material Safety Data Sheet
NCR	Noise Control Regulations, 1992
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Control Act, 2004 (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NRTA	National Road Traffic Act, 1996 (Act No. 93 of 1996)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
OHSA	Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
OHSAS	Occupational Health and Safety Management Systems
PCB's	Polychlorinated Biphenyl
PCO	Pest Control Officer
PHRA-EC	Provincial Heritage Resources Agency – Eastern Cape
PPE	Personal Protective Equipment
RoM	Run of Mine
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SLP	Social and Labour Plan
SWMP	Stormwater Management Plan
TMM's	Trackless Mobile Machinery
VU	Vulnerable
WMA	Water Management Area
WSLM	Walter Sisulu Local Municipality

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mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT:	Aliwal Dolerite Quarry (Pty) Ltd
TEL NO:	051 633 3346
FAX NO:	-
POSTAL ADDRESS:	P.O. Box 314, Maletswai, 9750
PHYSICAL ADDRESS:	Erf 2928 (a portion of Erf 1), Maletswai, Buffelsbaden
FILE REFERENCE NUMBER:	**E**C 30/5/1/2/2/0215 MR & EC0017MR/102

A. INTRODUCTION

Aliwal Dolerite Quarry (Pty) Ltd (Aliwal Quarry) holds a mining right (EC 30/5/1/2/2/0215 MR) to mine dolerite over 55.5166 ha of Erf No 2928 (a portion of Erf 1), near Maletswai in the Walter Sisulu Municipality of the Eastern Cape. The Mining Right (MR) is valid until 24 March 2040, with the possibility of renewal. The DMPR approved a Section 102 application (EC0017MR/102) in terms of the MPRDA in December 2022 to expand the mining footprint. This approval increased the mining footprint of 55.5166 ha with an additional 6.7824 ha that extends over a portion of Portion 5 of the farm Melk Spruit No 12 (hereafter referred to as the "S102 Extension Area").

The 2025 environmental performance audit concluded that the 2011 Environmental Management Programme (EMPR) of Aliwal Quarry does not fully comply with Appendix 4 of GNR 982. The Quarry has since made various changes and/or improvements on site, and management identified the need to amend/update the EMPR to adequately manage and/or mitigate the environmental impacts associated with the activity as well as ensure compliance with the requirements of Appendix 4 of GNR 982 (as amended). The Quarry would also like to consolidate the 2011 EMPR and 2018 EMPR, that was approved as part of the Section 102 amendment application.

Accordingly, this document serves as the amended and consolidated EMPR for Aliwal Quarry, submitted to the DMPR in compliance with Section 35 of the EIA Regulations, 2014 (as amended). As per regulation 35: "*The competent authority must consider the environmental audit report and amended EMPr and, where applicable the amended closure plan, contemplated in regulation 34 and approve such amended EMPr, and where applicable the amended closure plan, if it is satisfied that it sufficiently provides for avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity, or where applicable the closure of the facility, and that it has been subjected to an appropriate public participation process*."

Should the DMPR approve this document (hereafter referred to as the "2025 EMPR"), this EMPR will replace the previously approved 2011 and 2018 EMPRs of the Quarry and will be applicable to all aspects of the mining activity throughout the operational- and decommissioning phases.

(GNR 982 APPENDIX 4 SECTION 1(1)(a))

B. DECLARATION OF INDEPENDENCE BY EAP

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) the proponent must appoint an independent Environmental Assessment Practitioner (EAP) to undertake any activities regulated in terms of the Act. Aliwal Dolerite Quarry (Pty) Ltd (hereafter referred to as the "MR Holder") appointed Greenmined Environmental (Pty) Ltd (hereafter referred to as "Greenmined") to undertake the amendment of the mine's EMPR. Greenmined has no

vested interest in Aliwal Dolerite Quarry (Pty) Ltd or the mining project and declares its independence as required by the Environmental Impact Assessment Regulations, 2014 (as amended) (EIA Regulations).

a) DETAILS OF THE EAP

Name of the Practitioner:	Ms Christine Fouché (Senior Environmental Specialist)
Tel No.:	021 851 2673
Cell No:	082 811 8514
E-mail address:	christine.f@greenmined.co.za

b) EXPERTISE OF THE EAP

Ms. Fouché has a Diploma in Nature Conservation and a B.Sc. in Botany and Zoology. Full cirriculum vitae with evidence is attached as Appendix I

Ms Fouché has twenty years' experience in doing Environmental Impact Assessments related projects in South Africa. Ms. Fouche is a registered Environmental Assessment Practitioner (registration no: 2019/1003) with EAPASA (Environmental Assessment Practitioners Association of South Africa). See a list of past projects attached as Appendix I.

(GNR 982 APPENDIX 4 SECTION 1(1)(b))

C. DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

a) LOCATION OF THE ACTIVITY

Table 1: Location of the activity.

Farm Name	Θ Erf 2928 (a portion of Erf 1) Θ Portion 5 of the farm Melk Spruit No 12
Mining Area (Ha)	Θ Mining Right Footprint: 55.5166 ha Θ S102 Extension Area: 6.7824 ha **Total Mining Footprint**: 62.299 ha
Magisterial District	Joe Gqabi District Municipality
Distance and direction from the nearest town	Aliwal Quarry is located ±3 km south-west of Maletswai, near the R58 travelling to Burgersdorp.
21 digit Surveyor General Code for each farm portion	Θ C00500010000292800000 Θ C00500000000001200005

Mining Right Site Coordinates	A	-30° 42’ 13.85311”	26° 40’ 50.67110”
	B	-30° 42’ 14.52522”	26° 40’ 51.96911”
	C	-30° 42’ 15.26281”	26° 40’ 54.15002”
	D	-30° 42’ 16.69336”	26° 40’ 55.80857”
	E	-30° 42’ 19.43279”	26° 40’ 57.71013”
	F	-30° 42’ 26.37506”	26° 41’ 00.95086”
	G	-30° 42’ 28.79195”	26° 41’ 03.75398”
	H	-30° 42’ 29.36976”	26° 41’ 05.68111”
	J	-30° 42’ 29.87858”	26° 41’ 08.08949”
	K	-30° 42’ 29.49021”	26° 41’ 12.78943”
	L	-30° 42’ 33.91468”	26° 41’ 13.13291”
	M	-30° 42’ 43.18546”	26° 41’ 16.53533”
	N	-30° 42’ 53.37863”	26° 41’ 22.20009”
	P	-30° 42’ 56.47420”	26° 41’ 24.52185”
	Q	-30° 42’ 58.77362”	26° 41’ 27.55764”
	R	-30° 43’ 09.95726”	26° 41’ 09.97288”
	S	-30° 42’ 19.06215”	26° 40’ 53.01130”
S102 Extension Area Coordinates	T	-30° 42’ 44.17218”	26° 40’ 57.47018”
	U	-30° 42’ 43.41183”	26° 41’ 01.12263”
	V	-30° 43’ 02.59775”	26° 41’ 07.51693”
	W	-30° 43’ 03.67082”	26° 41’ 03.18488”

b) DESCRIPTION OF THE MINING ACTIVITIES

1. PROJECT DESCRIPTION – OPERATIONAL PHASE

(Information obtained from the 2011 EMPR compiled by Umhlaba Environmental Consulting CC)

Aliwal Quarry has been in existence since 1976, and Aliwal Dolerite Quarry (Pty) Ltd commenced with the mining of the area in 2010. In the last 20 years, low cost and informal housing have encroached towards the eastern edge of the mine, resulting in the development of a residential area along the entire eastern boundary of the Quarry.

The dolerite that the mine exploits is an intrusive formation that pushed through the underlying Tarkastad Subgroup of the Beaufort Group. The mine is an opencast operation whereby aggregates of all sizes are produced at the on-site processing plant. The solid dolerite deposit is blasted and loaded by excavator onto dumper trucks that transports the rock to the crusher. The mine is one of the major suppliers of aggregate for the construction industry in the Maletswai area. Products are transported from the site by road.

The Quarry periodically operates 24-hours, 7-days a week especially when material is needed for road related projects. Blasting is permitted only between 08:00 and 19:00, Mondays to Saturdays, and is not allowed on Sundays and public holidays. The day time shift entails the following main activities:

- Drilling and blasting;
- Excavations, loading and hauling material to the processing plant;
- Crushing, screening and stockpiling of material;
- Dispatch; and
- Maintenance and cleaning of the plant.

During the night shift activities are limited to the following:

- Drilling;
- Excavations, loading and hauling of material to the processing plant;
- Crushing, screening and stockpiling of material; and
- Cleaning and maintenance of the plant.

Sub-contractors are periodically engaged for contract crushing and mining activities and typically establish temporary site camps within the mining boundaries during operations.

1.1 Mining Footprint

The approved mining footprint of Aliwal Quarry extends over ±62.299 ha (including the S102 extension area). However, the MR Holder currently (2025) utilises only ±28 hectares of the total footprint for mining-related activities. The northern and most southern parts of the property remain largely in a natural state. The active mining area is fenced off from the remaining property.

Historical the western section of the quarry pit extended over the mining boundary, and the MR Holder subsequently applied for approval of the Minister in terms of Section 102 of the MPRDA to expand the mining footprint with 6.7824 ha. The S102

Extension Area (approved in 2022) now allows the development of the quarry pit in a western direction. It further contributes to the softening of the high walls that were historically mined up to the mine's boundary.

1.2 Mining Activities

The mine consists of a single main quarry pit covering ±9.8 hectares (as of 2025) within the mining footprint. The pit extends in a north–south direction along the length of the ridge on the property. Dolerite is extracted using conventional drilling and blasting techniques. The frequency of blasting is determined by product demand, and each blast is carefully monitored to ensure safety and compliance.

Following a blast, boulders that are too large (>500 mm) to be loaded into the primary crusher are broken by means of a hydraulic hammer. The muck pile (blasted rock) is removed from the pit using excavators and trackless mobile machinery (TMM's) and either deposited directly into the jaw crusher or deposited on the Run of Mine (RoM) stockpile for later processing through the secondary-, tertiary- and quaternary crushing and screening processes to result in the desired products. The material is stockpiled until transported to or collected by clients. All material removed from site is sent over the weighbridge to ensure the correct weight and prevent overloading.

Aliwal Quarry ("the Quarry") also has the ability to wash the products if required by the client. Water from the washing plant is directed to the nearby settling ponds from where it can be recycled for reuse.

1.3 Site Infrastructure

Aliwal Quarry has well-established buildings and infrastructure that support its mining operations. The Quarry is accessed via a gravel road that turns off the R58 connecting Maletswai and Burgersdorp. In addition, the Burgersdorp – Dreunberg - Aliwal North – Zastron - Sannaspos railway line (no longer in use) runs along the north/north-eastern boundary of the mine, and the access road crosses the railway line before entering the mine.

The office building accommodates the administrative personnel. The mine has well established workshops, storage rooms, a wash bay that drains to an oil sump, and a paved area used for services. Ablution facilities associated with the office complex and workshops drain to a septic tank and French drain system, which is serviced as

required. Offices and/or stores are also associated with the wash plant, crusher plant, and weighbridge. A change/break room with ablutions is available to the employees near the workshop.

The following main areas are defined at the mine as shown in the following figure:

A. Entrance Gate and Guard House;
B. Office Block;
C. Workshops and Storage Areas;
D. Change Room and Ablutions;
E. Washing Plant Area;
F. Settling Ponds;
G. Stockpile Areas;
H. Processing Area;
I. Control Room;
J. Eskom Substation;
K. Salvage Yard;
L. Quarry Pit;
M. Waste Rock Dump;
N. Diesel Depot;
O. Eskom Transformer Station.

Figure 1: Satellite view of the various operational areas at Aliwal Quarry where the yellow line shows the mine boundary and the green line indicates the S102 extension area (image obtained from Google Earth).

Also refer to Appendix B for the General Surface Plan of Aliwal Quarry.

1.4 Water Use

Potable water for domestic purposes is obtained from the onsite borehole. The water is pumped to a tank prior to use.

Production water (for dust suppression and washing of material) is extracted from the quarry sump (which originates from rainwater). The water used at the plant for the washing and screening of material flows via gravity to the nearby settling ponds. The water captured in the settling ponds is recirculated to the plant for reuse. Sediment within the settling ponds is allowed to dry out and then mixed into the product or used to rehabilitate mined areas.

Aliwal Quarry has a water use authorisation (reference no: 23086205) to:

- use water from the borehole on the farm in terms of Section 21a of the National Water Act, 1998 (Act No. 36 of 1998) (NWA);

- Θ abstract water from the quarry sump/dam in terms of Section 21a of the NWA;
- Θ reuse water from the last tank of the oil sump in terms of Section 21a of the NWA;
- Θ store water in the quarry in terms of Section 1b of the NWA;
- Θ spray water for dust suppression purposes in terms of Section 21g of the NWA.

1.5 Electricity Use

The mining operation is supplied with Eskom power, and Gensets are used as back-up power.

1.6 Servicing and Maintenance

The well-equipped workshops of the Quarry, that form part of the office complex, are used for the repair and maintenance of all mining related equipment and machinery. Water from the wash bay and service areas drains into an oil separator.

Fuel is stored in a 9 000 l tank in a roofed and bunded area. Chemicals are stored in designated storage areas in accordance with the product specific material safety data sheets.

1.7 Waste Management

The MR Holder has an integrated waste management policy, and the company strives to recycle where possible. All non-polluting equipment / material which could potentially have a future use is stored within the salvage yard.

Presently, waste is separated into waste that can be re-used, and those that must be removed from the site. General waste (that cannot be reused) is removed to the Maletswai landfill site. Hazardous waste is removed from site by qualified hazardous waste handling contractors.

The ablutions of the mine drains into a septic tank with French drain system that is serviced by a registered liquid waste removal service provider when needed.

1.8 Labour Component

Presently (as of September 2025), Aliwal Quarry has a permanent labour component of 21 employees. Sub-contractors are periodically employed for contract crushing and mining operations, who then bring their own personnel. The

permanent employees of the Quarry mainly reside in Maletswai and are daily transported to site. No employees (permanent and/or sub-contractor) reside on site.

2. DECOMMISSIONING OBJECTIVES

The overall objective of a rehabilitation plan is to minimise adverse environmental impacts associated with the quarrying activities whilst maximising the future utilisation of the property. The idea, therefore, is to leave the mined area in a condition that reduces all negative impacts normally associated with mining.

The primary objective, at the end of this project's life cycle, is to obtain a closure certificate in compliance with the requirements of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [MPRDA]. To achieve this, the following key objectives must be met:

- Demolish and remove all buildings and/or infrastructure that will no longer be required by the landowner, as well as all waste material, in accordance with the requirements of this EMPr and/or the Provincial Department of Mineral and Petroleum Resources (DMPR).
- Shape and contour all disturbed areas in accordance with the approved Closure Plan.
- Ensure that permanent changes to the topography resulting from mining activities are sustainable and do not pose erosion risks or safety hazards to the landowner or surrounding community.
- Effectively utilise available topsoil to promote the re-establishment of vegetation.
- Ensure that all rehabilitated areas are stable and self-sustaining with adequate vegetation cover.
- Eradicate all invasive and alien plant species by intensive management of the mining area.

The site-specific closure objectives are discussed in the attached Closure Plan (Appendix D), however, a summary of the closure objectives for the mine were included below.

The decommissioning phase will entail the reinstatement of the processing- and stockpile areas by removing the stockpiled material, and site infrastructure and equipment (not required by the landowner) and landscaping the disturbed footprints. It is anticipated that the buildings and roads will be retained for future use.

Due to the impracticality of importing large volumes of fill to restore the excavation to its original topography, the rehabilitation option is to develop the quarry pit into a landscape

feature. This will entail creating a series of irregular benches along the quarry faces, the top edges of each face being blasted away to form scree slopes on the benches below, thereby reducing the overall face angle. The benches will be softened with overburden, top-dressed with topsoil and vegetated with an appropriate grass mix if vegetation does not naturally establish in the area within six months of the replacement of the topsoil.

The decommissioning activities will therefore consist of the following:

- Sloping and landscaping the quarry pit;
- Removing all stockpiled material;
- Removing all mining machinery, equipment and waste from site;
- Landscaping all disturbed areas and replacing the topsoil;
- Vegetating the reinstated area; and
- Controlling/monitoring the invasive plant species for at least one growth season.

Once the mining area was rehabilitated the MR Holder is required to submit a closure application to the DMPR in accordance with Section 43(4) of the MPRDA, 2002 that states: "*An application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion contemplated in subsection (3) and must be accompanied by the prescribed environmental risk report*". The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

2.1 Residual Impacts After Closure

Overburden will be used to soften the benches of the quarry pit and assist with the shaping of the excavation during post-quarrying rehabilitation. Provided all final slopes are maintained at 1:3 batters (quarry rim and mine residue infill) and successfully revegetated, there will be no long term instability in the rehabilitated area. The quarry cliffs precision blasted to angles of not steeper than 85˚ also provide an element of stability to hard rock quarry cliffs.

Once adequately rehabilitated, the quarry will nevertheless behave as a sump and collect surface run-off after wet periods. The floor of the quarry may, therefore, reveal fluctuating water levels depending on rainfall patterns. Considering this, it is important to adequately block access to the excavation (soil berm / oversize rock in entrance) to prevent unauthorized access by humans (especially children) and animals upon closure of the mine.

(GNR 982 APPENDIX 4 SECTION 1(1)(c))

c) COMPOSITE MAP

The mine plans showing the land and mining area to which the right relates, in accordance with Regulation 42 of the Mining Titles Registration Act, 1967 (Act No 16 of 1967), are attached as Appendix A1 for the Mining Right area and Appendix A2 for the S102 Extension Area. Also refer to Appendix B for the General Surface Plan of the operation.

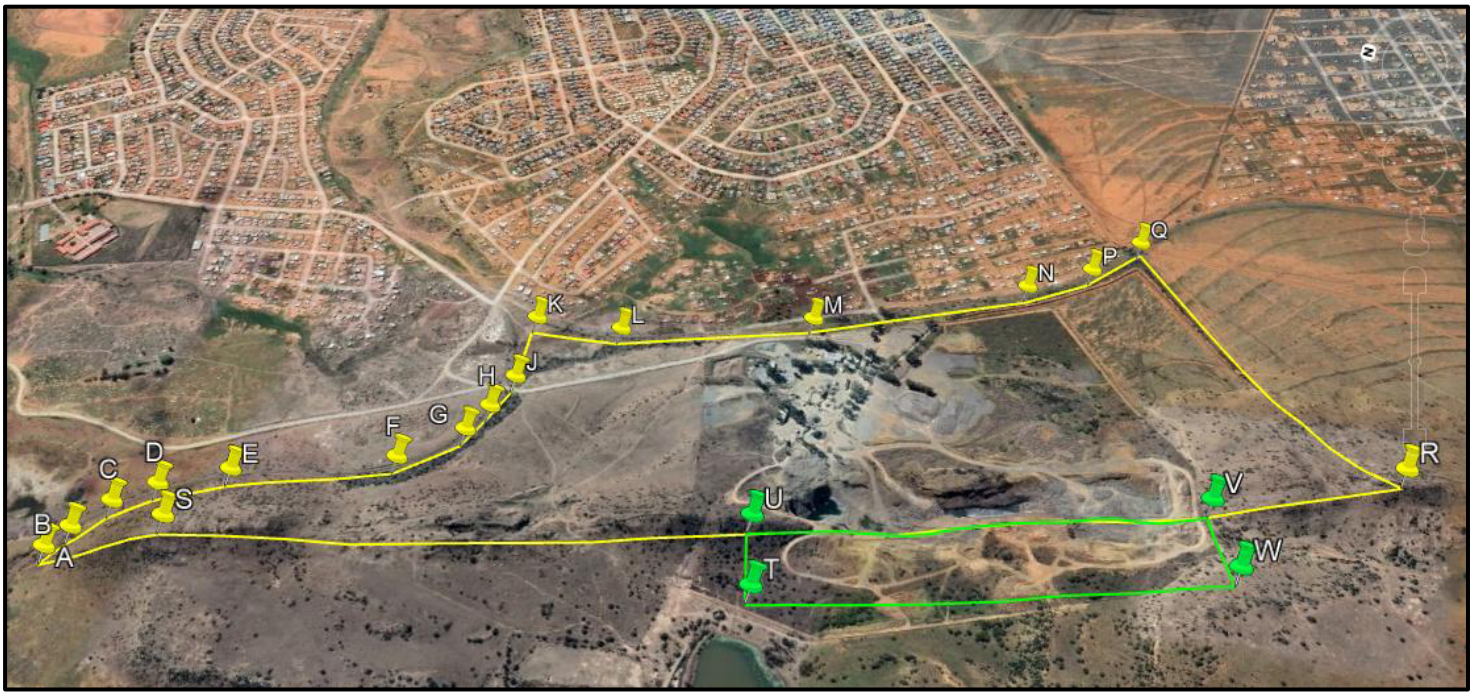

Figure 2: Satellite view of the Aliwal Quarry mining footprint (yellow polygon). The S102 Extension Area is indicated by the green polygon (image obtained from Google Earth). Note: To optimise space, true north is directed to the left.

D. POLICY AND LEGISLATIVE CONTEXT

a) APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT

Table 2: Policy and Legislative Context.

LEGISLATION	REFERENCE WHERE APPLIED	POLICY CONTEXT APPLICABLE TO PROJECT
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).	Section G(b) Impacts to be mitigated in their respective phases.	The mitigation measures proposed for the site includes specifications of the CARA, 1983.
Mine Health and Safety Act, 1996 (Act No 29 of 1996) read together with applicable amendments and regulations thereto including relevant OHSA regulations.	Section H Impact Management Actions and Outcomes. Section I – M Mechanisms for Monitoring Compliance.	The mitigation measures proposed for the site includes specifications of the MHSA, 1996 (as amended).
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) read together with applicable amendments and regulations thereto. Θ Section 39(6)(a)	Section A Introduction.	The 2011 EMPR of Aliwal Quarry must be amended as a result of an environmental performance audit (2025). The MR Holder further wishes to consolidate the 2011 and 2018 EMPRs of the mine.
National Environmental Management Act,1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended) Θ Section 35 of GNR 982 (as amended)		
National Environmental Management: Air Quality Control Act, 2004 (Act No 39 of 2004) read together with applicable amendments and regulations thereto specifically the National Dust Control Regulations, GN No R827.	Section G(b) Impacts to be mitigated in their respective phases. Section H Impact Management Actions and Outcomes. Section I – M Mechanisms for Monitoring Compliance.	The mitigation measures proposed for the site consider the NEM:AQA, 2004 and the National Dust Control Regulations.
National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) read together with applicable amendments and regulations thereto.		The mitigation measures proposed for the site includes specifications of the NEM:BA, 2004.
National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) read together with applicable amendments and regulations thereto.		The mitigation measures proposed for the site consider the NEM:WA.

LEGISLATION	REFERENCE WHERE APPLIED	POLICY CONTEXT APPLICABLE TO PROJECT
NEM:WA, 2008: National norms and standards for the storage of waste (GN 926)		
National Heritage Resources Act. 1999 (Act No 25 of 1999).	Section G(b) Impacts to be mitigated in their respective phases. Section H Impact Management Actions and Outcomes. Section I – M Mechanisms for Monitoring Compliance.	The mitigation measures proposed for the site includes specifications of the NHRA, 1999.
National Water Act, 1998 (Act No 36 of 1998) read together with applicable amendments and regulations thereto.		The mitigation measures proposed for the site includes specifications of the NWA, 1998.
Noise Control Regulations GNR 154 of January 1992 and Application of Noise Control Regulations, CNR 155 of January 1992 framed under the ECA.		The mitigation measures proposed for the site consider the NCR requirements.

b) TABLE OF LEGAL TRIGGERS FOR THE MINING OPERATION

Table 3: Table of Legal Triggers applicable to the Mining Operation.

LEGISLATION	TRIGGER	APPLICABILITY TO ALIWAL QUARRY	RESPONSIBLE AUTHORITY	COMPLIANCE STATUS
National Environmental Management Act (NEMA) (Act 107 of 1998)	Environmental Authorisation (EA) required for listed activities.	The 2011 EMPR is deemed equivalent to an EA in accordance with the provisions of the NEMA, 1998. An Environmental Authorisation (EA) regarding the Section 102 amendment of the mining right was approved in 2019.	DMPR	**Compliant:** Amended EMPR to be submitted for approval.
Mineral and Petroleum Resources Development Act (MPRDA) (Act 28 of 2002)	Mining right required for mineral extraction.	Aliwal Dolerite Quarry (Pty) Ltd holds a mining right (EC 30/5/1/2/2/0215 MR) and permission was granted in terms of Section 102 of the MPRDA for the amendment of the mining footprint (EC0017MR/102).	DMPR	**Compliant:** Mining Right valid until March 2040.

LEGISLATION	TRIGGER	APPLICABILITY TO ALIWAL QUARRY	RESPONSIBLE AUTHORITY	COMPLIANCE STATUS
National Water Act (NWA) (Act 36 of 1998)	Water use licensing / General authorisation (Section 21 activities).	Aliwal Quarry has a water use authorisation (reference no: 23086205) to: Θ use of water from a borehole, Θ abstract water from the quarry sump/dam, Θ reuse of water from the last tank of the oil sump, Θ store water in the quarry, Θ spray water for dust suppression.	DWS	**Potentially Non-Compliant:** The water uses of the Quarry is due for reviewed to ensure compliance with Section 21 of the NWA.
National Environmental Management: Air Quality Act (NEM:AQA) (Act 39 of 2004)	Dust control and potential air emission licensing.	Dust suppression measures required to comply with the National Dust Control Regulations.	Municipality Air Quality Officer	**Compliant:** Emissions does not trigger an air emission licence. Dust suppression in place and monthly fallout dust monitoring implemented on site.
National Environmental Management: Waste Act (NEMWA) (Act 59 of 2008)	Waste management licensing for hazardous and general waste.	Waste is removed by registered contractors; no on-site disposal occurs.	DMPR	**Compliant:** Waste managed per legal requirements.
National Heritage Resources Act (NHRA) (Act 25 of 1999)	Heritage impact assessment required if archaeological finds occur.	No heritage resources within the mining footprint.	SAHRA / Provincial Heritage Resources Agency – Eastern Cape (PHRA-EC)	**Compliant:** No heritage sites in the mining area.
Occupational Health and Safety Act (OHSA) (Act 85 of 1993)	Workplace safety and hazard management.	Compliance with safety regulations for workers and mining equipment.	Department of Labour (DoL)	**Compliant:** Safety regulations followed, but ongoing audits required.
Conservation of Agricultural Resources	Land degradation and soil conservation measures.	Measures required for erosion control and vegetation restoration.	Department of Rural Development	**Compliant**: Stormwater Management Plan implemented on site. Rehabilitation plan in

LEGISLATION	TRIGGER	APPLICABILITY TO ALIWAL QUARRY	RESPONSIBLE AUTHORITY	COMPLIANCE STATUS
Act (CARA) (Act 43 of 1983).			and Agrarian Reform	place but requires ongoing monitoring
Noise Control Regulations (GNR 154 of 1992, under the Environment Conservation Act).	Noise level monitoring and control.	Blasting and mining operations generate noise, requiring mitigation measures.	DMPR	**Compliant:** Noise monitoring in place.
National Road Traffic Act (NRTA) (Act 93 of 1996)	Regulation of transport for heavy mining vehicles.	Trucks transport material via public roads; overloading must be prevented.	Department of Transport	**Compliant:** Transport regulations followed, but monitoring required.

E. DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

The relevant landowner (regarding the S102 Extension Area), stakeholders and I&AP's were informed of the proposed EMPR amendment by means of an advertisement in The Reporter newspaper, and on-site notices that were placed at conspicuous places. A notification letter inviting comments on the EMPR amendment over a 30-days commenting period (ending 11 November 2025) was sent to the landowners, neighbouring landowners, stakeholders, and other I&AP that may be interested in the project and could be identified. Flyers were distributed in the Joe Gqabi Residential Area bordering the Quarry to the east. Notifications were available in both English and isiXhosa. No comments were received on the draft EMPR amendment that could be incorporated into this report, the final EMPR amendment, to be submitted to the DMPR for consideration.

Table 4: List of the I&AP's and stakeholders that were notified of the EMPR amendment.

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Θ Number Two Piggeries (Pty) Ltd Portion 5 of Melk Spruit No 12 Θ Transnet Ltd Portion 11 of Melk Spruit No 12 Portion 12 of Melk Spruit No 12 Θ Raumix (Pty) Ltd Portion 11 of Buffels Vallei No 60	Θ Department of Economic Development, Environmental Affairs and Tourism Θ Department of Labour Θ Department of Public Works Θ Department of Rural Development and Agrarian Reform Θ Department of Transport

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Θ Group YWO Trading Enterprises CC Portion 29 of Buffels Vallei No 60 Θ Mr and Me Gebuza Portion 30 of Buffels Vallei No 60 Θ Dr RM Ntsaba-Surtie Portion 120 of Buffels Vallei No 60 Portion 121 of Buffels Vallei No 60 Θ Grootste Geluk Boerdery (Pty) Ltd Vaalkop No 61 Θ Walter Sisulu Municipality Remainder of Portion 12 of Buffels Vallei No 60 Portion 6 of Vaalkop No 61 Portion 3 of Melk Spruit No 12 Portion 0 of Erf 1	Θ Department of Water and Sanitation Θ Eastern Cape Provincial Heritage Resources Agency Θ Eskom Θ Joe Gqabi District Municipality Θ SAHRA Θ Transnet Θ Walter Sisulu Local Municipality Θ Walter Sisulu Local Municipality Ward No 10

Refer to the following table for an explanation on how the public participation process of this project took the methods stipulated in Regulation 41 of the NEMA Regulations into account.

Table 5: Table comparing the required methods with the public participation process of this project.

REQUIREMENTS IN TERMS OF NEMA REGULATION 41	PUBLIC PARTICIPATION PROCESS FOLLOWED
Θ Regulation 41(2)(a): *Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of-* *(i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and* (ii) *Any alternative site.* Θ Regulation 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;*	Notice boards were placed at four conspicuous and publicly accessible areas, namely the: Θ Entrance to the mine; Θ Pick and Pay; Θ Fruit and Vegetable store; and Θ Community Hall. The notice boards complied with the requirements of Regulation 41(3). The notices were printed on boards of 60 x 42 cm in Arial font of sufficient size. The notice boards were available in both English and isiXhosa.

REQUIREMENTS IN TERMS OF NEMA REGULATION 41	PUBLIC PARTICIPATION PROCESS FOLLOWED
(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.* Θ Regulation 41(4): *A notice board referred to in subregulation (2) must—* *(a) be of a size of at least 60cm by 42cm; and* (b) *display the required information in lettering and in a format as may be determined by the competent authority.*	
Θ Regulation 41(2)(b): *giving written notice, in any of the manners provided for in section 47D of the Act, to-* (i) *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;* (ii) *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;* (iii) *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;* *(iv) the municipality which has jurisdiction in the area;* *(v) any organ of state having jurisdiction in respect of any aspect of the activity;* *(vi) any other party as required by the competent authority;*	(i) The Right Holder is the landowner of Erf 2928 (Portion of Erf 1). The landowner of Portion 5 of Melk Spruit No 12 was informed of the project and invited to comment on the EMPR amendment. (ii) The directly surrounding landowners, and lawful occupiers of the land were informed of the project and invited to comment on the EMPR amendment through notification letters/flyers. (iii) The Ward Councillor applicable to the mining footprint was invited to comment on the project and the EMPR amendment. (iv) Representatives from the local and district municipalities were invited to comment on the project and EMPR amendment. (v) As listed in Table 4 the relevant state departments and entities were invited to comment on the project and the EMPR amendment.
Θ Regulation 41(2)(c): *Placing an advertisement in-* *(i) One local newspaper; or* *(ii) 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.*	The project and availability of the amended EMPR were advertised in The Reporter newspaper on 10 October 2025.

REQUIREMENTS IN TERMS OF NEMA REGULATION 41	PUBLIC PARTICIPATION PROCESS FOLLOWED
Θ Regulation 41(2)(d): *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…*	The Reporter is a bilingual provincial newspaper distributed in the region applicable to this application.
Θ Regulation 41(2)(e): *Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to—* *(i) illiteracy;* *(ii) disability; or* (iii) *any other disadvantage.*	Where applicable, I&AP's were messaged via Whatsapp or SMS. Persons not answering their telephones were also messaged to explain the reason for the call from the consultants.
Θ Regulation 41(5): *Where public participation is conducted in terms of this regulation for an application or proposed application, subregulation (2)(a), (b), (c) and (d) need not be complied with again during the additional public participation process contemplated in regulations 19(1)(b) or 23(1)(b) or the public participation process contemplated in regulation 21(2)(d)…*	Not applicable to this application.
Θ Regulation 41(6): *When complying with this regulation, the person conducting the public participation process must ensure that—* *(a) information containing all relevant facts in respect of the application or proposed application is made available to potential interested and affected parties; and* (b) *participation by potential or registered interested and affected parties is facilitated in such a manner that all potential or registered interested and affected parties are provided with a reasonable opportunity to comment on the application or proposed application.*	The amended EMPR containing all the facts in respect of this application was available to the landowner (of the S102 Extension Area), stakeholders and potential I&AP's for perusal and commenting over a 30-days commenting period. The amended EMPR was also available on the Greenmined website. I&AP's and stakeholders were invited to contact the EAP should additional information be required. No comments were received on the draft EMPR amendment that could be incorporated into this report, the final EMPR amendment, to be submitted for departmental consideration.
Θ Regulation 41(7): *Where an environmental authorisation is required in terms of these Regulations and an authorisation, permit or licence is required in terms of a specific environmental management Act, the public participation process contemplated in this Chapter may be combined with any public participation processes prescribed in terms of a specific environmental management Act, on condition that all relevant authorities agree to such combination of processes.*	Not applicable to this project.

a) SUMMARY OF ISSUES RAISED BY I&APS

Table 6: Summary of issues raised by IAPs

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE MR HOLDER	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
AFFECTED PARTIES	**X**	-	-	-	-
Landowner/s	**N/A**	-	-	-	-
Aliwal Doloriet Groewe (Pty) Ltd Θ Erf 2928 (portion of Erf 1)	-	The Right Holder is also the landowner.			
Number Two Piggeries (Pty) Ltd Θ Portion 5 of Melk Spruit No 12	X	No comments were received from the landowner that could be incorporated into the final EMPR amendment.			
Lawful occupier/s of the land	-	-			
N/A	-	There are no lawful occupiers of the land other than the landowners.			
Landowners or lawful occupiers on adjacent properties	**X**	-			
Transnet Ltd Θ Portion 11 of Melk Spruit No 12 Θ Portion 12 of Melk Spruit No 12	X	No comments were received from the surrounding landowners that be incorporated into the final EMPR amendment.			
Raumix (Pty) Ltd Θ Portion 11 of Buffels Vallei No 60	X				
Group YWO Trading Enterprises CC	X				

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE MR HOLDER	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
Θ Portion 29 of Buffels Vallei No 60					
Mr and Me Gebuza Θ Portion 30 of Buffels Vallei No 60	X				
Dr RM Ntsaba-Surtie Θ Portion 120 of Buffels Vallei No 60 Θ Portion 121 of Buffels Vallei No 60	X				
Grootste Geluk Boerdery (Pty) Ltd Θ Vaalkop No 61	X				
Walter Sisulu Municipality Θ Remainder of Portion 12 of Buffels Vallei No 60 Θ Portion 6 of Vaalkop No 61 Θ Portion 3 of Melk Spruit No 12 Θ Portion 0 of Erf 1	X				
Municipal councillor	**X**	-	-	-	-
Walter Sisulu Local Municipality (Ward 10)	X	No comments were received from the ward councillor that could be incorporated into the final EMPR amendment.			

INTERESTED AND AFFECTED PARTIES		**DATE COMMENTS RECEIVED**	**ISSUES RAISED**	**EAPS RESPONSE TO ISSUES AS MANDATED BY THE MR HOLDER**	**SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED**
Municipality		-	-	-	-
Walter Sisulu Local Municipality (WSLM)	X	No comments were received from the municipality that could be incorporated into the final EMPR amendment.			
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e	-	-	-	-	-
Department of Public Works (DPW)	X	No comments were received from the DPW that could be incorporated into the final final EMPR amendment.			
Department of Transport (DoT)	X	No comments were received from the DoT that could be incorporated into the final final EMPR amendment.			
Department of Water and Sanitation (DWS)	X	No comments were received from the DWS that could be incorporated into the final EMPR amendment.			
Eskom	X	No comments were received from Eskom that could be incorporated into the final EMPR amendment.			
Transnet	X	No comments were received from Transnet that could be incorporated into the final EMPR amendment.			

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE MR HOLDER	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
Communities	X	No comments were received from the community to the east of the mining area, that could be incorporated into the final EMPR amendment.			
Dept. Land Affairs	X	No comments were received from the Department of Land Affairs that could be incorporated into the final EMPR amendment.			
Traditional Leaders	N/A	N/A	N/A	N/A	N/A
Other Competent Authorities affected	X	-	-	-	-
Department of Economic Development, Environmental Affairs and Tourism (DEDEAT)	X	No comments were received from DEDEAT that could be incorporated into the final EMPR amendment.			
Department of Rural Development and Agrarian Reform (DRDAR)	X	No comments were received from DRDAR that could be incorporated into the final EMPR amendment.			
Department of Labour (DoL)	X	No comments were received from DoL that could be incorporated into the final EMPR amendment.			
Eastern Cape Provincial Heritage Resources Agency (PHRA-EC)	X	No comments were received from PHRA-EC that could be incorporated into the final EMPR amendment.			
Joe Gqabi District Municipality (JGDM)	X	No comments were received from JGDM that could be incorporated into the final EMPR amendment.			

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES AS MANDATED BY THE MR HOLDER	SECTION AND PARAGRAPH REFERENCE IN THIS REPORT WHERE THE ISSUES AND OR RESPONSE WERE INCORPORATED
South African Heritage Resources Agency (SAHRA)	X	No comments were received from SAHRA that could be incorporated into the final EMPR amendment.			

F. ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE MINING AREA

(Information obtained from the 2011 EMPR compiled by Umhlaba Environmental Consulting CC)

a) CLIMATE

The following graph shows the maximum, minimum and average temperatures of the Maletswai region. Maletswai experiences its highest temperatures during the summer months from November – March with peaks of up to 33°C; thereafter the mercury drops to lows of 0°C during June/July.

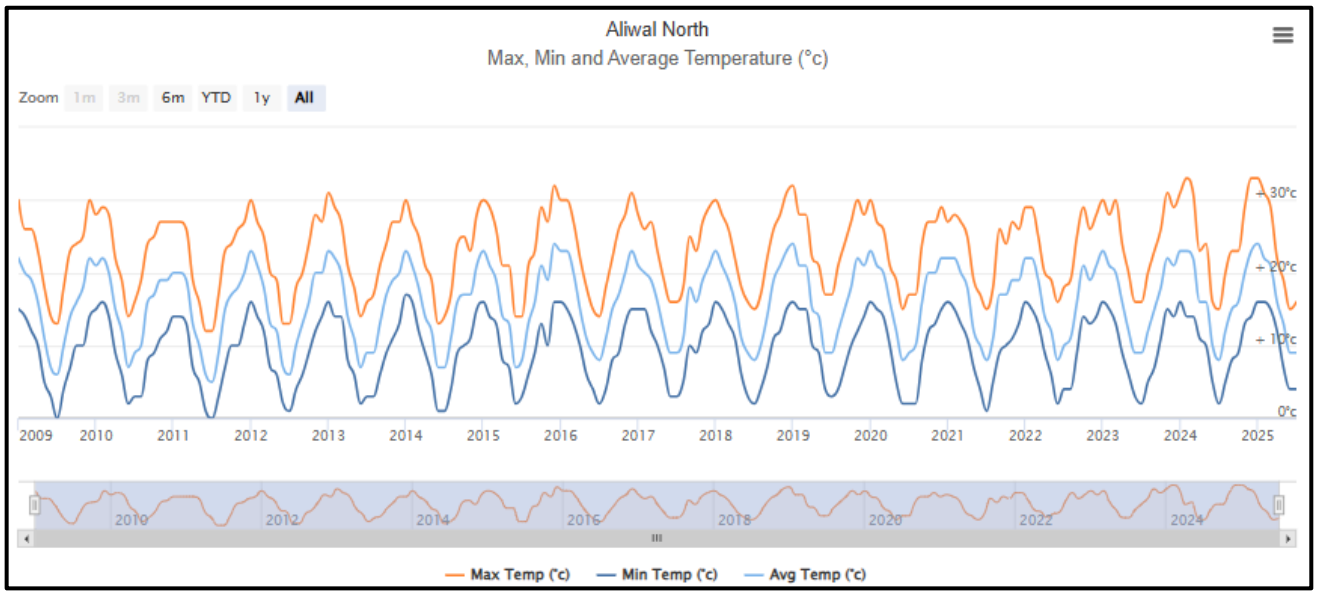

Figure 3: Maximum, minimum, and average temperature of the Maletswai region where the orange line indicates the maximum temperature, the light blue line shows the averages, and the dark blue line shows the minimum temperatures (chart obtained from http://www.worldweatheronline.com)

According to the 2011 EMPR the average rainfall of the Maletswai area is ±569 mm that mainly occurs as summer thunderstorms, while the evaporation is generally well in excess of the rainfall. The following chart, obtained from World Weather Online, shows that the measured rainfall for the period January 2024 to January 2025 was ±332 mm, while the area received the lowest rainfall during July/August 2024 and the highest in April 2024.

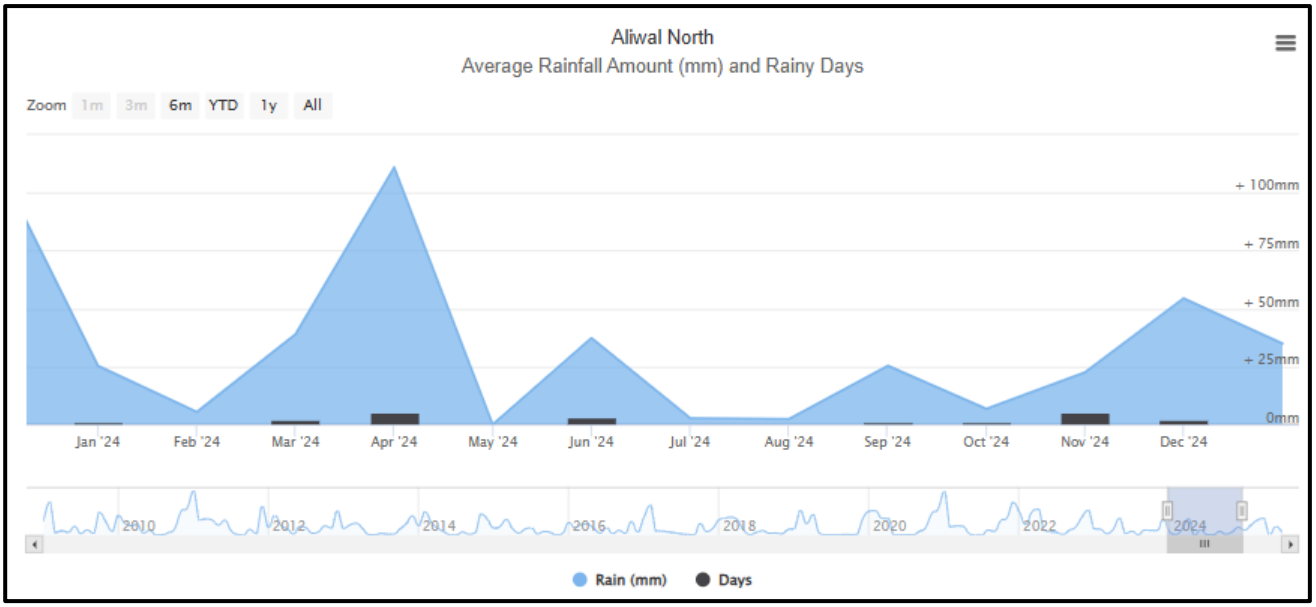

Figure 4: Average rainfall amount and rainy days count for the Maletswai region between January 2024 and January 2025 (chart obtained from http://www.worldweatheronline.com)

The Aliwal North Airstrip is the nearest weather station to the mine that provides wind statics. According to the data, the dominant wind direction of the region is fairly constant in a north to north-north-western direction (south / south-easterly wind), with the average wind speed being ±5 knots as shown in the figure below.

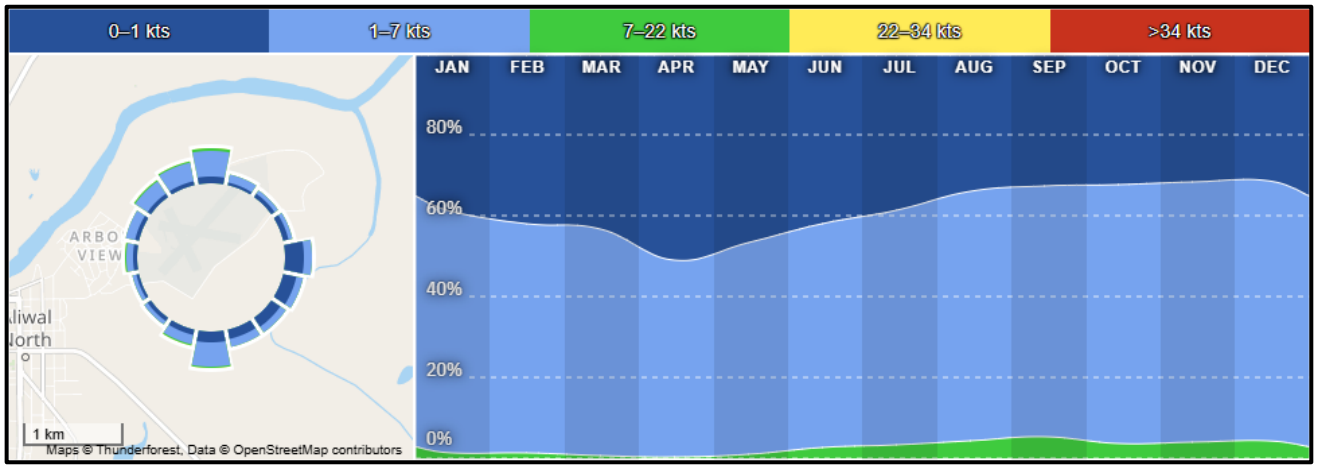

Figure 5: Image showing the dominant wind direction (first panel) and average wind speed over a 12 month period as measured at the Aliwal North Airstrip (image obtained from http://www.windfinder.com/windstatistics/aliwal_north_airport).

b) TOPOGRAPHY

The natural (pre-mining) topography of the site can be described as flat along the eastern section (±1 360 asml) of the mining environment, while the western section is dominated by a ridge that rises some 50 m from the flat eastern section to ±1 420 asml. The excavation associated with the mine is mining into this ridge. Areas where mining took place have historically resulted in steep gradients that are most obvious on the western side of the excavation. The approval of the Section 102 Extension Area and subsequent increase in the mining footprint now allows the gradual correction of these steep gradients. The route indicated below shows an average slope of 11.3% over 2.85 km, with a maximum elevation gain of 174 m (or -182 m elevation loss).

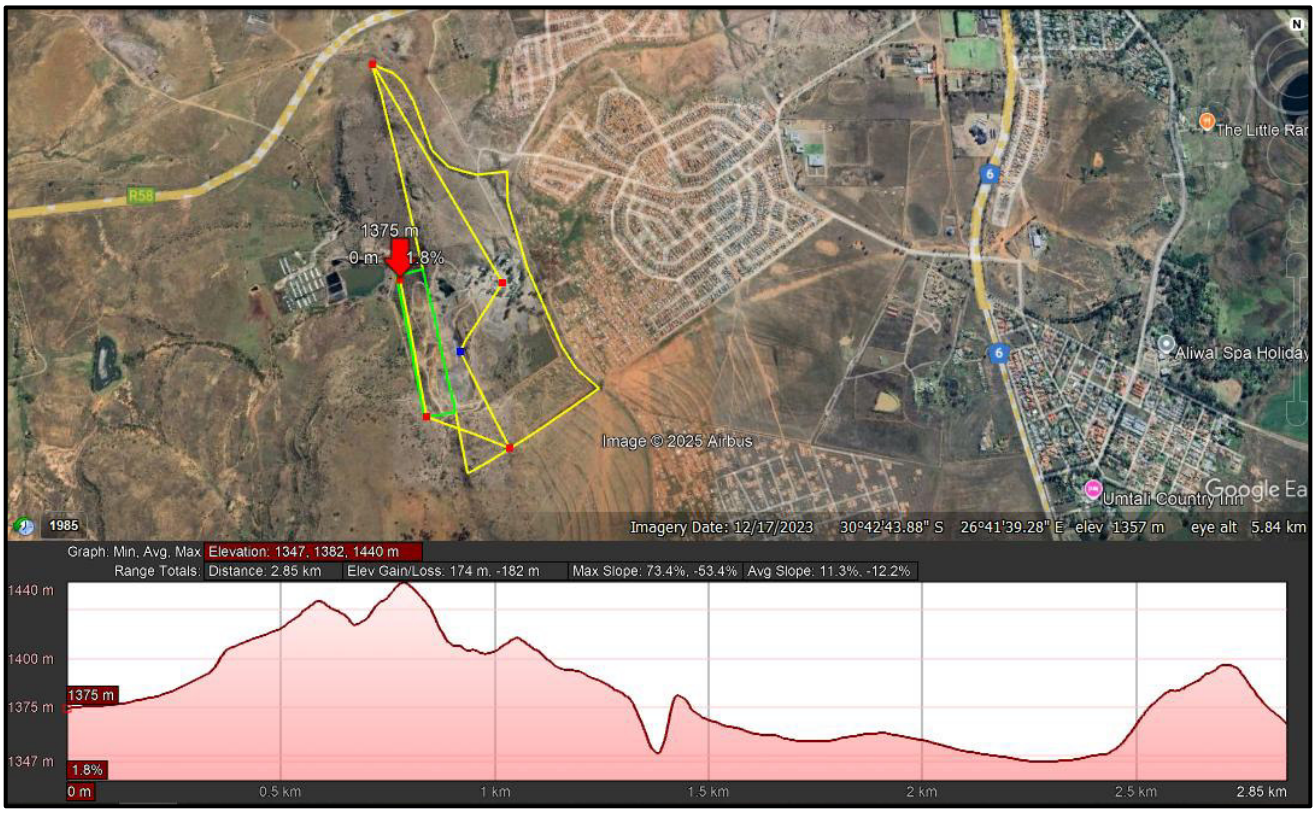

Figure 6: Elevation profile of the mining area (Image obtained from Google Earth).

c) VISUAL CHARACTERISTICS

The visual environment surrounding the Quarry is characterised by a combination of natural rural landscape elements and existing human interventions. While the broader setting is generally open with wide horizons, the mining area is bordered by a number of roads, a railway line, and the Joe Gqabi Residential Settlement to the east. These features introduce a strong anthropogenic component to the local visual character and reduce the overall sense of visual naturalness.

As a result, the visual absorption capacity (landscape's ability to incorporate visual elements without significantly altering its overall visual character or quality) of the immediate area is relatively higher than in a purely natural or agricultural setting. The presence of established infrastructure and the residential development means that the Quarry, although visually prominent, is less dissimilar than it would be in an undisturbed rural landscape. Nevertheless, exposed quarry faces, stockpiles, and operational equipment still present as noticeable features, particularly where they contrast sharply with the surrounding natural areas.

Overall, the visual character of the area can be described as open and moderately transformed, with the quarry forming one of several human-induced landscape modifications visible within a setting that already accommodates roads, rail, and residential development.

d) AIR QUALITY AND NOISE AMBIANCE

Air Quality

The air quality in the surrounding area is influenced by both natural and anthropogenic factors. Baseline conditions are shaped by the semi-arid climate, which results in naturally dusty conditions, particularly during dry and windy months. Existing sources of particulate matter include unpaved roads, vehicle movement, and domestic activities within the adjacent Joe Gqabi settlement. The surrounding road network also contributes intermittently to localised emissions from vehicle exhaust and entrained dust.

Aliwal Quarry contributes to the air quality of the area through the following:

- Quarrying operations, including blasting, crushing, and materials handling.
- Heavy vehicle movement on unpaved haul roads, which can further increase dust levels.
- Windblown dust from cleared areas, stockpiles and exposed rock surfaces.

Overall, ambient air quality can be described as moderately affected by dust and local emissions, with background concentrations elevated relative to purely rural areas due to the proximity of housing, transport infrastructure, and quarry-related activities. Sensitive receptors include the nearby Joe Gqabi community, where dust deposition and potential nuisance from suspended particulates may be more pronounced.

Noise Ambiance

The ambient noise environment in the vicinity of the Quarry reflects the influence of road traffic, community activities, and quarry operations. Existing sources of sound include vehicle movement on surrounding roads, localised household and community noise from the Joe Gqabi settlement, and intermittent agricultural activity in the broader area. Consequently, baseline noise levels are elevated above those typical of remote rural areas due to the presence of settlement and road activity.

Within and around the Quarry, elevated noise levels are associated with:

- Θ Blasting, which produces sharp, short-duration noise events.
- Θ Drilling, crushing, and screening operations, which generate continuous mechanical noise during operational hours.
- Θ Heavy machinery and truck movement, both within the site and on access routes.

Overall, the noise environment can be described as moderately elevated due to community and traffic activity, with quarry operations being the principal contributor to high-intensity and peak noise events.

e) GEOLOGY AND SOIL

The region which the Quarry is currently exploiting comprises a dolerite extrusion that overlies the sedimentary sandstones & mudstones of the Burgersdorp Formation of the Tarkastad Subgroup belonging to the Beaufort Group that forms part of the Karoo Supergroup.

The Tarkastad Subgroup had formed during the late Mesozoic – to early Palaezoic eras some 250 to 285 million years ago. The early Triassic Period, of which the upper sequences of the Tarkastad Subgroup had formed, is characterized by an abundance of sandstone and red mudstone rhythmite formations. This red mudstone is the marker and indicator between the Adelaide – and Tarkastad Subgroup that both form part of the Beaufort Group. The Tarkastad Subgroup is furthermore spilt into an upper Burgersdorp Formation (red mudstone rich) and a lower Katberg Formation (sandstone rich).

The sandstones & mudstones of the Burgersdorp Formation contain about 42% quarts, 9% feldspar, 34% lithic fragments and about 14% matrix (Johnson, 1991). Volcanic rock fragments continue to be an important component of the Burgersdorp Formation. The dolerite extrusion at Aliwal Quarry resulted in a steeply ascending hill-shaped mountain ridge. It is a dark grey dolerite (higher concentration of feldspar) with a consistent texture. The targeted mineral in the quarry is therefore the dolerite.

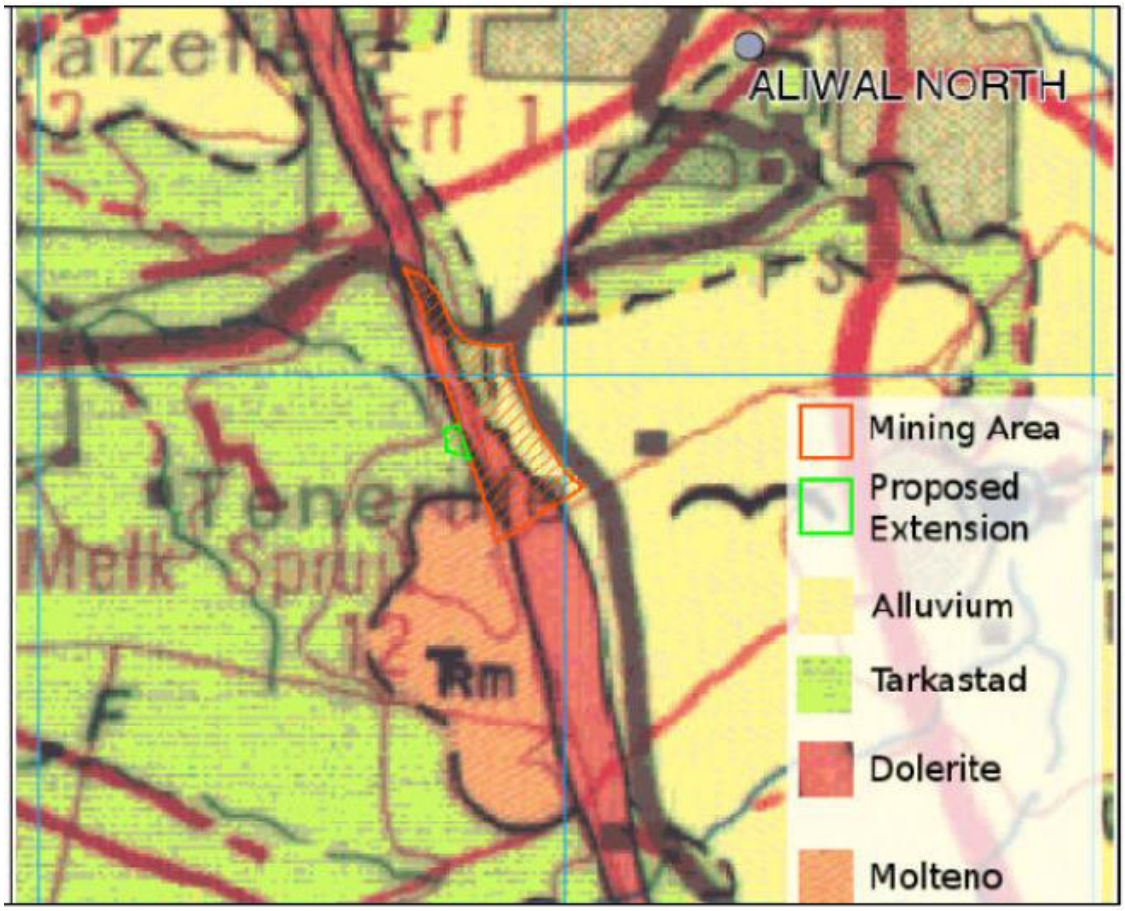

Figure 7: Typical east-west geological section (Umhlaba, 2011).

According to the 2011 EMPR the soil present at the mining area is a shallow covering of weathered dolerite material. The adjoining area consists of sandstone and a mixture of brown and grey mudstone. Further away the soils are of an alluvial nature.

f) HYDROLOGY

The area surrounding Aliwal Quarry falls within a semi-arid catchment characterised by low and variable rainfall, with surface water flow occurring primarily in the form of ephemeral drainage lines during seasonal rainfall events. Permanent water bodies are limited, and groundwater is an important resource for both domestic and agricultural use in the region. Drainage features in the immediate vicinity of the Quarry are typically shallow and weakly defined.

Surface Water

The mine is situated within the Kraai sub-water management area that forms part of the Upper Orange Water Management Area (ID 12). The following figure shows that the Quarry falls within a River FEPA (Freshwater Ecosystem Priority Area) associated with the Orange River that passes the mine ±1.9 km to the north. The FEPA designation is intended to guide the protection of remaining natural ecosystems and prevent new incompatible land uses. In this case, the Quarry does not represent a new or expanding threat to the FEPA, as its extent and operational area are already formalised and managed under authorisation. With appropriate ongoing compliance to environmental management measures the location of the quarry within the FEPA does not present a significant additional risk to the ecological functioning or hydrological integrity of the Orange River system.

Figure 8: Hydrology of the Maletswai area as presented on the National Wetland and NFEPA BGIS map viewer. The Orange River passes the mine to the north, and the River FEPA is indicated by the green shading.

Due to the topography of the site, most of the rain water falling within the mining footprint will flow in an easterly direction. The majority of water emanating from the western section of the mine will end up in the quarry sump. Once in the quarry pit the water is used for processing and dust suppression purposes. Runoff from the opposite (western) side of the ridge will flow down the hill and dissipate into the surrounding veld. Rain falling east of the quarry pit will flow overland in an easterly direction towards the access road and Joe Gqabi settlement. From the road there is a series on non-perennial streams that directs water in a northerly direction through some of the suburbs of Aliwal towards the Orange River. The Orange River is ±1.9 km to the north of the mine. Only in times of extremely high rainfall does water from the mine flow towards these non-perennial streams. In the majority of rainfall events water runoff from the mine infiltrates into the ground without reaching the streams.

Aliwal Quarry installed stormwater control berms that are maintained to direct runoff water away from sensitive areas and prevent erosion. Seepage berms were installed along the eastern boundary of the mine to dissipate flow and prevent sediment rich water from leaving the mine.

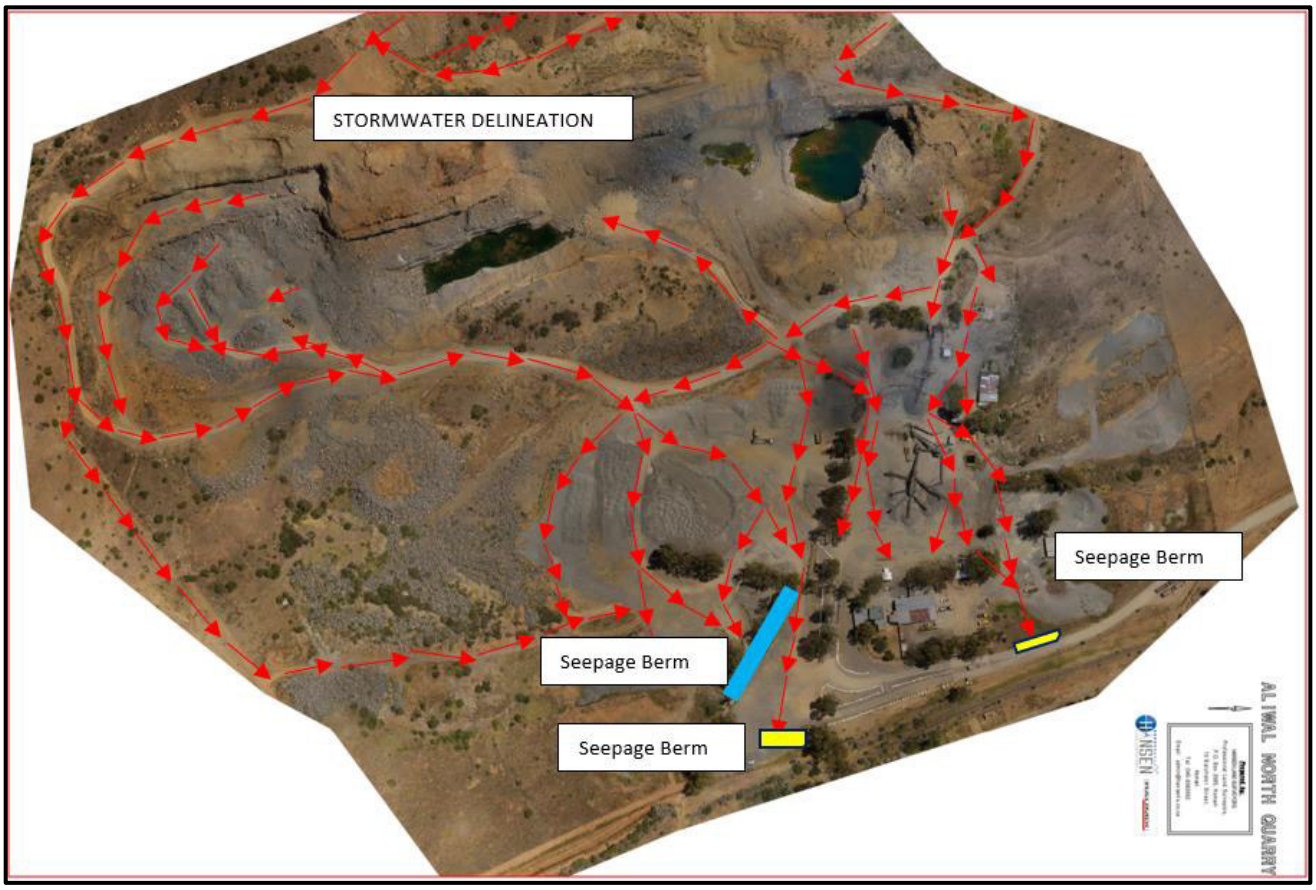

Figure 9: Plan showing the stormwater flow and structures at Aliwal Quarry (Aliwal Quarry (Pty) Ltd).

Groundwater

According to the 2011 EMPR, the largest part of the Joe Gqabi District Municipality (formerly known as the Ukhahlamba DM) falls within the Minor Groundwater System type. A CSIR study conducted into groundwater potential of South Africa defines a Minor Groundwater System as a systems which can supply a community of 1 510 people from a single borehole at 30 ℓ/c per day. Properly managed boreholes in these systems can generate an average yield of 1.58 ℓ/s. The borehole of the quarry is ±60 m deep.

Importance of Water Quality Monitoring

Water quality monitoring is a critical component of environmental management at mining operations, as it enables the early detection of potential contamination and ensures compliance with legal and regulatory standards, including those set by the National Water Act (Act No. 36 of 1998). Regular monitoring helps to protect surrounding surface and groundwater resources from degradation due to mining-related activities such as excavation, material washing, and hydrocarbon use in workshops. It also provides essential data for assessing the effectiveness of pollution control measures, safeguarding the health of local ecosystems, downstream users, and the broader environment. By implementing a proactive surface water quality monitoring programme, Aliwal Quarry demonstrates its commitment to sustainable resource use and environmental protection throughout the life of the mine and into closure.

It is proposed that the annual surface water quality monitoring programme of the Quarry must include key parameters such as pH, electrical conductivity (EC), total dissolved solids (TDS), sulphates, nitrates, phosphates, and total petroleum hydrocarbons (TPH), among others. These parameters are aligned with the Department of Water and Sanitation (DWS) Water Quality Guidelines for aquatic ecosystems and domestic use. The full list of applicable parameters and sampling requirements is provided in Appendix G of this EMPr.

g) TERRESTRIAL BIODIVERSITY AND GROUNDCOVER

According to Mucina and Rutherford (2012) the natural vegetation types of the study area comprises the Upper Gariep Alluvial Vegetation (AZa4) as indicated in the following figure.

Figure 10: BGIS National Vegetation Map showing the vegetation type of the study area, where the blue shading indicates the Upper Gariep Alluvial Vegetation (AZa4), and the black stripped polygons indicate the mine. (Image obtained from the BGIS Map Viewers website).

Upper Gariep Alluvial Vegetation (Aza4)

The vegetation and landscape features of this vegetation type mainly comprise of flat alluvial terraces supporting complex riparian thickets dominated by native *Vachellia karroo* and *Diospyros lycioides*, flooded grasslands, reed beds and ephemeral herblands populating mainly sand banks within rivers and the banks.

The dominate vegetation consist of Small Trees: *Vachellia karroo, Celtis africana, Salix mucronata subsp. mucronata. Tall Shrubs: Diospyros lycioides, Melianthus comosus, Searsia pyroides. Low Shrubs: Asparagus setaceus, A. suaveolens. Woody Climber: Clematis brachiata. Succulent Shrubs: Lycium arenicola, L. hirsutum. Herb: Rubia cordifolia.*

The vegetation type is classified as Vulnerable and according to Mucina and Rutherford (2012) only 3% is statutorily conserved in the Tussen Die Riviere, Gariep Dam and Oviston Nature Reserves. More than 20% has been transformed for mainly cultivation and the building of dams. A conservation target of 31% was set for the vegetation type.

2018 SANBI Vegetation Map

According to the latest vegetation map provided for South Africa (SANBI, 2018), the project site is still within the Upper Gariep Alluvial Vegetation.

Site Specific Conditions

As the mine has been in operation since 1976, the majority of the vegetation cover is disturbed. According to the land use maps of the area, it is recognised that there is no natural vegetation remaining in the vicinity of the quarry. This is a result of extensive overgrazing by community owned cattle. The recent extension of the excavation into the S102 extension area also caused the removal of the vegetation along the side and top of the ridge.

Blue Gum trees were historically planted along the perimeter of the crushing plant and stockpile areas. These trees have the beneficial impact of reducing the dispersal of dust from the mine and lowering the visibility of mining related structures towards the east.

Based on an ecological walk-through, conducted by Nkurenkuru in 2018, it is known that the species listed in the following table occurred within the mining area. Five of these species are listed under Schedule 4 of the Eastern Cape Nature and Environmental Conservation Ordinance, 1974 (No 19 of 1974) (ECNCO), meaning the species is legally protected within the province. No red data species were identified by the ecologist during the 2018 site assessment. The two tree species (Cabbage Tree and Wild Olive) that were identified, are not protected but are regarded as important species as they provide valuable ecological functions and services.

Table 7: List of protected species (conservation importance) identified in 2018 (Nkurenkuru).

SPECIES	COMMON NAME	ECNCO SCHEDULE 4
Aloe broomii	Mountain / Snake Aloe	YES
Aloe ferox	Bitter Aloe	NO
Euphorbia clavarioides	Lion's Spoor	NO
Anacampseros telephiastrum	-	YES
Rabiea albinota	Clock Plant	YES
Ruschia spp.	-	YES
Stapelia grandiflora	Carrion Flower	YES
Cussonia spicata	Cabbage Tree	NO
Olea earopaea subs. *africana*	Wild Olive Tree	NO

Based on the above, it is important that site management familiarise themselves with the protected species and should any of these plants need to be removed the activity will have to be permitted by the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism.

Invasive plant species known to occur in the mining areas include (but is not limited to) the following:

Θ *Argemone mexicana*	Mexican Poppy	NEM:BA Category 1b
Θ *Datura ferox*	Large Thorn Apple	NEM:BA Category 1b
Θ *Nicotiana glauca*	Wild Tobacco	NEM:BA Category 1b
Θ *Opuntia engelmannii.*	Round Leaved Prickly Pear	NEM:BA Category 1b
Θ *Opuntia ficus-indica*	Sweet Prickly Pear	NEM:BA Category 1b
Θ *Solanum sisymbrifolium*	Dense-thorned Bitter Apple	NEM:BA Category 1b
Θ *Xanthium strumarium*	Large Cocklebur	NEM:BA Category 1b

h) FAUNA

The 2011 EMPR mentions that apart from small game and rodents occurring on the steeper slopes to the south of the mine, there are no other wild animals close to the mine. Rock hare, steenbok and rodents are present but not plentiful in the area surrounding the mine. The 2018 walk-through by Nkurenkuru confirmed the presence of Rock hyrax and steenbok within the mining area. The community's cattle, sheep, and goats also (illegally) enter the mining footprint on occasion.

The 2011 EMPR includes a list (following table) of red data bird species that may occur in the greater study area. However, no red data bird species are known to reside within the mining footprint, nor is the area conducive to these species.

Table 8: Bird list of species common in the greater study area.

SPECIES	COMMON NAME	RED DATA STATUS
Gyps coprotheres	Cape Vulture	Vulnerable
Polemaetus bellicosus	Martial Eagle	Endangered
Anthropoides paradiseus	Blue Crane	Near Threatened
Mirafra cheniana	Melodious Lark	Near Threatened
Balearica regulorum	Grey Crowned Crane	Endangered
Sagittarius serpentarius	Secretarybird	Vulnerable
Neotis denhami	Denham's Bustard	Vulnerable
Circus maurus	Black Harrier	Endangered
Ciconia nigra	Black Stork	Endangered
Phoenicopterus ruber	Greater Flamingo	Near Threatened

The 2011 EMPR lists the Yellow-bellied House Snake (*Lamprophis fuscus*) and Striped Harlequin Snake (*Homoroselaps dorsalis*) as potential red data species that could occur in the region. To date these species have not been observed at the mine. However, it is known that the Skaapsteker (*Psammophylax rhombeatus*), Cape Cobra (*Naja nivea*), and Rinkhals (*Hemachatus haemachatus*) do occur on occasion in the immediate surroundings.

In summary, the Quarry has been operational for at least 49 years, and the faunal component has become accustomed to the mining operations. No endangered and/or protected species reside within the active mining footprint that warrants special consideration.

i) CULTURAL AND HERITAGE ENVIRONMENT

The 2011 EMPR and site management confirmed that there are no sites of archaeological or cultural importance within the mining area. The local community also did not identify any site of historical importance, and to date no complaints with regard to the impact of the mine on surrounding land uses of cultural/heritage concern have been received.

The Quarry has a Chance Find Protocol that all employees receive training on when joining the team. This protocol will be implemented should any discoveries be made during the operational and/or rehabilitation phases.

j) SOCIO-ECONOMIC ENVIRONMENT

The Walter Sisulu Local Municipality (WSLM), situated within the Joe Gqabi District of the Eastern Cape Province, encompasses the towns of Maletswai, Burgersdorp, James Calata, Steynsburg, and Ventersburg. Maletswai is a Sesotho name that means “a place of salt” referring to the thermal springs of the town. The municipality spans approximately 4 358 km² and Aliwal Quarry is located within Ward 10 of the WSLM.

Demographics

As of the 2022 census, the municipality's population stands at ±104 213, reflecting an increase in growth from 77 477 in 2011. The age distribution indicates a youthful demographic, with ±28% under 15 years, 64.6% between 15 and 64 years, and 7.1% aged 65 and above. The racial composition is predominantly Black African (77.7%), followed by Coloured (13%), and White (8.1%) persons.

Economy

At district level, the economy is dominated by community/government services, trade, and finance, with agriculture and tourism identified as catalytic sectors for growth in the IDP/One-Plan discourse. Mining contributes a very small share of district GVA. Local economic participation is therefore highly sensitive to public-sector spending, seasonal agriculture, SMME activity, and visitor flows.

Infrastructure and Services

The WSLM boasts relatively high levels of basic service delivery. As of recent data (2022), 89.7% of households have flush toilets connected to sewerage systems, 84.4% benefit from weekly refuse removal, 66.7% have piped water inside their dwellings, and 94.7% use electricity for lighting.

Challenges

The Joe Gqabi District Municipality's IDP (2024/25 and 2025/26) frames development around infrastructure reliability (water, roads), enterprise development and jobs, agriculture and tourism value-chains, and governance/performance improvements.

Aliwal Quarry

As mentioned earlier, the permanent employees of Aliwal Quarry resides mainly in Maletswai from where they are daily transported to the mine. The mine also contributes to the local economy of the area, both directly and through the multiplier effect that its presence creates. Equipment and supplies are purchased locally, and wages are spent at local businesses, generating both jobs and income in the municipal area. In addition thereto the implementation of the Social and Labour Plan obligations contribute positively to the socio-economic environment of the local community.

The products of the Quarry are principally consumed by the following users:

- Θ Construction industry for concrete products,
- Θ Roads industry for asphalt development,
- Θ Transnet for ballast rock,
- Θ Brick making industry.

k) LAND USE

As previously mentioned, Aliwal Quarry has been operational for many years, with the most northern and southern portions of the mining area fenced off from the active mining area. The railway line and access road separates the mining area from the Joe Gqabi settlement to the east, while the western ridge screens the majority of the mining activities from the western farms. Mining of this ridge and expanding the excavation into the S102 Extension Area will however increase the visibility of the mining operations towards the west. Apart from the Joe Gqabi settlement, the surrounding areas are mainly used for agricultural purposes, with a piggery established on Portion 5 of Melk Spruit No 12.

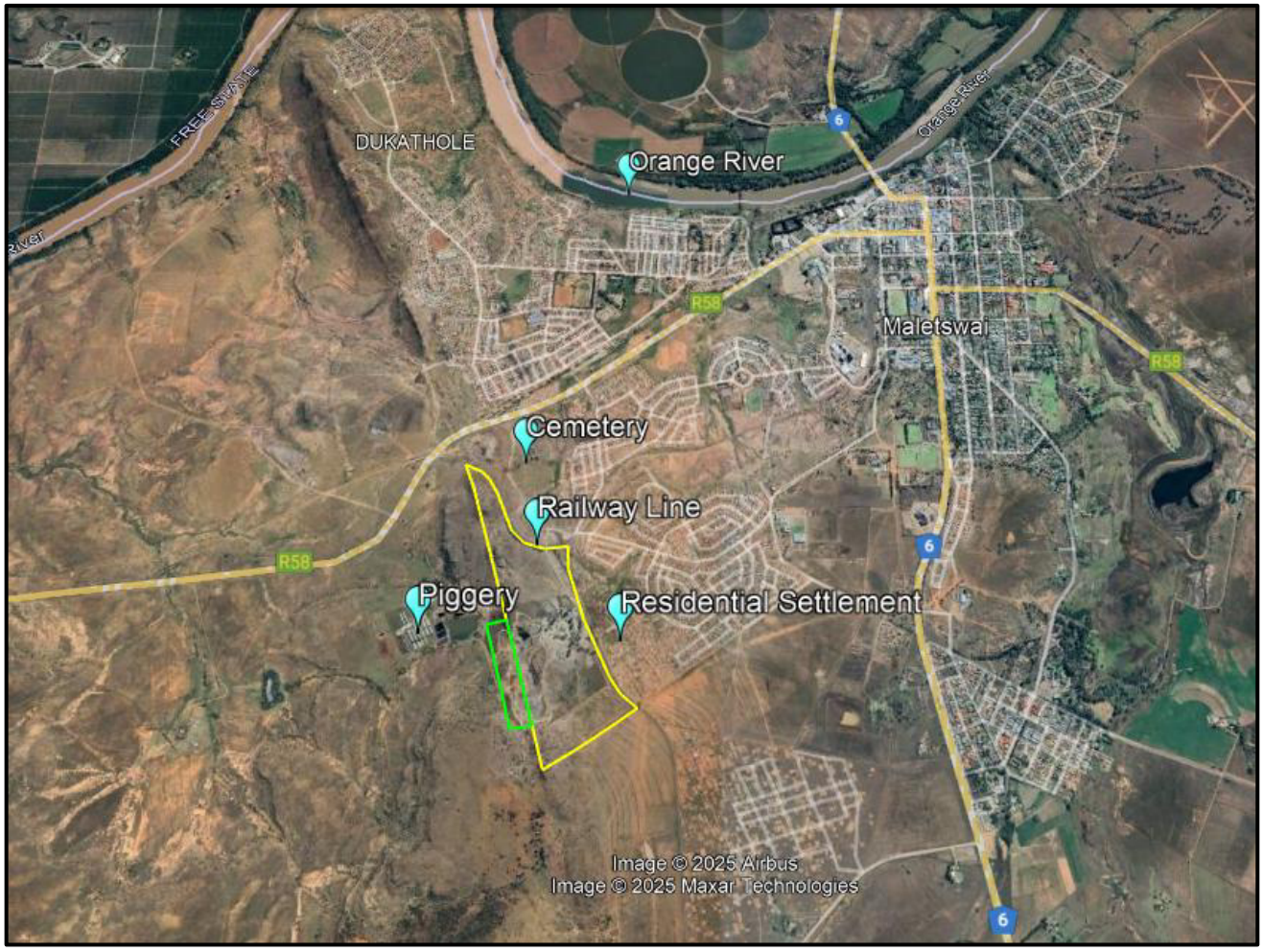

Figure 11: Satellite view of the mining area (yellow and green polygons) in relation to the surrounding land uses (image obtained from Google Earth).

The following table provides a description of the land uses and/or prominent features that currently occur at or within a 500 m radius of the earmarked area:

Table 9: Land uses and/or prominent features that occur at or within 500 m radius of the mining area.

LAND USE CHARACTER	YES	NO	DESCRIPTION
Natural area	**YES**	-	The mining area is surrounded by natural areas used for agricultural purposes.
Low density residential	-	**NO**	-
Medium density residential	-	**NO**	-
High density residential	**YES**	-	The Joe Gqabi settlement with some informal dwellings developed directly east of the mining area.
Informal residential	**YES**	-	
Retail commercial & warehousing	-	**NO**	-
Light industrial	-	**NO**	-
Medium industrial	-	**NO**	-
Heavy industrial	-	**NO**	-
Power station	-	**NO**	-
High voltage power line (132 kV or more)	-	**NO**	Although various power lines (22 kV & 66 kV) occur within 500 m of the mining area, no high voltage power lines (132 kV or more) crosses the area.
Office/consulting room	-	**NO**	-
Military or police base / station / compound	-	**NO**	-
Spoil heap or slimes dam	**YES**	**-**	Various waste rock/overburden dumps occur within the mining footprint.
Quarry, sand or borrow pit	**YES**	**-**	Part of the mining area.
Dam or reservoir	**YES**	**-**	Farm dams occur on the property and surrounding farms.
Hospital/medical centre	-	**NO**	-
School/ crèche	-	**NO**	The Joe Gqabi Secondary School is more than 500 m from the mining area.
Tertiary education facility	-	**NO**	-
Church	-	**NO**	-
Old age home	-	**NO**	-
Sewage treatment plant	-	**NO**	-
Train station or shunting yard	-	**NO**	-
Railway line	**YES**	**-**	The railway line borders the north/north-eastern boundary of the mining area. The line is however no longer operational.
Major road (4 lanes or more)	-	**NO**	-
Airport	-	**NO**	-
Harbour	-	**NO**	-
Sport facilities	-	**NO**	-
Golf course	-	**NO**	-
Polo fields	-	**NO**	-
Filling station	-	**NO**	-
Landfill or waste treatment site	-	**NO**	-
Plantation	-	**NO**	-
Agriculture	**YES**	-	The mine is situated within an area mainly used for grazing of livestock.

LAND USE CHARACTER	YES	NO	DESCRIPTION
			A piggery operates ±300 m west of the Quarry.
River, stream, or wetland	-	**NO**	The Orange River is ±1.9 km north of the mining area.
Nature conservation area	-	**NO**	-
Mountain, hill, or ridge	**YES**	-	The topography of the area is mainly flat with a ridge spanning the western boundary of the mine.
Museum	-	**NO**	-
Historical building	-	**NO**	-
Protected Area	-	**NO**	-
Graveyard	**YES**	-	The access road to the mine passes a graveyard east of the mining footprint.
Archaeological site	-	**NO**	-
Other land uses (describe)	-	**NO**	-

(APPENDIX 4 SECTION 1(1)(d))

G. DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

a) IMPACTS AND RISKS ASSOCIATED WITH THE PROJECT

The table below presents the potential positive and negative environmental impacts associated with this project, identified for each main activity and applicable project phase (operational and decommissioning). This EMPR does not elaborate on the planning-, site establishment- and or construction phases as this is an operational Quarry and these phases are no longer applicable. Refer also to Appendix C for the Environmental Impact Statement.

It should be noted that the listed impacts have not been reassessed in detail, as no significant changes or additions to the mining activities have been identified that were not already assessed during the mining right application process and subsequently approved by the DMPR.

Accordingly, Table 10 provides a summary of the relevant impacts that may arise during the operational and/or decommissioning phases of the project, along with an updated and project-specific list of mitigation and management measures to be implemented on site. For details on compliance monitoring and performance assessment, please refer to the section titled *Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including headings (l)–(m)* as required by Appendix 4 of the EIA Regulations (GNR 982 of 2014) (as amended).

Table 10: Positive and negative impacts associated with the project.

ACTIVITY	PHASE	ENVIRONMENTAL RECEPTOR	POTENTIAL IMPACT	SIGNIFICANCE RANKING (AFTER MITIGATION)
MINING ACTIVITIES				
Θ Stripping of vegetation and topsoil.	Θ Operational Phase	Θ Flora Θ Fauna Θ Soil Θ Visual Charateristics	1. Destruction of vegetation. 2. Loss of faunal habitat due to destruction of vegetaiton. 3. Destruction of topsoil structure. 4. Removal of vegetation resulting in visual impacts.	1. Low-Medium 2. Low-Medium 3. Low-Medium 4. Medium
Θ Stripping, hauling and stockpiling of overburden.	Θ Operational Phase	Θ Air Quality Θ Noise Ambiance Θ Hydrology / Stormwater Θ Visual	1. Dust caused by materials handling (stripping & stockpiling) and vehicle entrainment. 2. Noise caused by materials handling and vehicle movement. 3. Water impacts: greater potential for increased sediment load in stormwater run-off from the overburden dumps. 4. Visual impacts associated with the overburden dump.	1. Medium. Potential I&AP concerns of dust raise the impact to Medium-High. 2. Medium. Potential I&AP concerns raise the impact to Medium-High. 3. Medium 4. Medium
Θ Drilling, blasting and secondary breaking.	Θ Operational Phase	Θ Air Quality	1. Dust caused by drilling and blasting.	1. Medium. Potential I&AP concerns of dust raise the impact to Medium-High.

ACTIVITY	PHASE	ENVIRONMENTAL RECEPTOR	POTENTIAL IMPACT	SIGNIFICANCE RANKING (AFTER MITIGATION)
		Θ Noise Ambiance Θ Socio-economic environment Θ Hydrology	2. Noise generated during drilling and blasting. 3. Vibrations causing structural damage to off-site buildings. 4. Potential for fly-rock which is a risk to human and fauna. 5. Water quality impacts generated as a result of blasting activities.	2. Medium. Potential I&AP concerns raise the impact to Medium-High. 3. Low. Potential I&AP concerns raise the impact to Low-Medium. 4. Medium. Potential I&AP concerns raise the impact to Medium-High. 5. Medium
Θ Loading and hauling.	Θ Operational Phase	Θ Air Quality Θ Noise Ambiance	1. Dust generation from materials handling and vehicle entrainment. 2. Noise generated by materials handling and vehicular activity.	1. Medium. Potential I&AP concerns raise the impact to Medium-High. 2. Medium. Potential I&AP concerns raise the impact to Medium-High.
Θ Concurrent rehabilitation	Θ Operational Phase	Θ Topography Θ Geology and Soil	The implementation of concurrent rehabilitation and alien vegetation removal will result in positive impacts through the reduction of negative impacts associated with mining.	N/A
PROCESSING ACTIVITIES				
Θ Crushing, screening, washing and stockpiling.	Θ Operational Phase	Θ Air Quality Θ Noise Ambiance	1. Dust generation during crushing, screening and washing.	1. Medium. Potential I&AP concerns raise the impact to Medium-High.

ACTIVITY	PHASE	ENVIRONMENTAL RECEPTOR	POTENTIAL IMPACT	SIGNIFICANCE RANKING (AFTER MITIGATION)
		Θ Hydrology	2. Noise generation during crushing, screening and stockpiling. 3. Water pollution as a result of increased sediment load in stormwater run-off from the plant area.	2. Medium. Potential I&AP concerns raise the impact to Medium-High. 3. Medium
Θ Dispatch of products from site.	Θ Operational Phase	Θ Air Quality Θ Noise Ambiance Θ Hydrology Θ Socio-economic Environment	1. Dust caused by materials handling and vehicle entrainment on roads. 2. Noise generated by materials handling and vehicular activity. 3. Water pollution potentially from product spills or hydrocarbon leaks associated with the vehicles. 4. Social impacts from vehicles entering the mine affecting regional air quality.	1. Medium. Potential I&AP concerns raise the impact to Medium-High. 2. Medium. Potential I&AP concerns raise the impact to Medium-High. 3. Medium 4. Medium
SUPPORTING SERVICES AND ACTIVITIES				
Water supply and use.	Operational Phase	Θ Hydrology Θ Groundwater	1. Water loss during mining and processing. 2. Surface water pollution. 3. Water reuse – **Positive Impact.**	1. Medium. 2. Medium. 3. Medium (+).

ACTIVITY	PHASE	ENVIRONMENTAL RECEPTOR	POTENTIAL IMPACT	SIGNIFICANCE RANKING (AFTER MITIGATION)
Stormwater management.	Operational Phase	Θ Hydrology Θ Groundwater	1. Water pollution (sediments) – increased sediment load in stormwater run-off. 2. Water pollution (hydrocarbons) – greater potential for increased hydrocarbon pollution in stormwater run-off.	1. Medium. 2. Medium.
Sanitation handling	Operational Phase	Θ Groundwater Θ Socio-economic environment.	1. Groundwater pollution as a result of overflowing septic tank. 2. Odour as a result of overflowing septic tank.	1. Medium 2. Low
Workshops & Maintenance	Operational Phase	Θ Hydrology Θ Groundwater Θ Visual Characteristics	1. Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. 2. Visual as a result of poor housekeeping.	1. Medium 2. Medium
Fuel Storage	Operational Phase	Θ Hydrology Θ Groundwater	1. Water pollution (hydrocarbon spills) as a result of hydrocarbon spills.	1. Medium
Salvage Yard Management	Operational Phase	Θ Surface Water Θ Groundwater	1. Water pollution (hydrocarbon spills) as a result of hydrocarbon spills.	1. Medium 2. Medium

ACTIVITY	PHASE	ENVIRONMENTAL RECEPTOR	POTENTIAL IMPACT	SIGNIFICANCE RANKING (AFTER MITIGATION)
		Θ Visual Characteristics	2. Visual as a result of poor housekeeping.	
Waste Management	Operational Phase	Θ Hydrology Θ Groundwater Θ Visual Characteristics	1. Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. 2. Visual (waste) impacts as a result of poor waste management. 3. Recycling of waste **(Positive Impact)**	1. Medium 2. Medium 3. Medium (+)
CLOSURE REQUIREMENTS				
Closure of Mine	Decommissioning Phase	Θ Socio-economic Environment.	1. Job losses as a result of retrenchment upon mine closure.	1. Medium-High

b) IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

Table 11: Impacts to be mitigated in their respective phases.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<u>Stripping of vegetation and topsoil.</u> Θ Destruction of vegetation.	Operational Phase	±40 ha	<u>Terrestrial Biodiversity and Groundcover – Management of Vegetation</u> Θ The mining boundaries must be clearly demarcated, and all operations must be contained to the approved mining area. The area outside the mining boundaries must be declared a no-go area, and all staff must be educated accordingly. Θ The Right Holder must be committed to a conservation approach, and the actual footprint of disturbance must be kept to a minimum. Θ Environmental induction must be arranged for all site staff to ensure that basic environmental principles are adhered to. This includes awareness of littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated areas, etc. Θ Cleared vegetation must be retained and may not be burned but can be mulched and stockpiled. Ideally the heaps can be covered with stockpiled topsoil and the material be retained for future site rehabilitation purposes. Θ The ECO must provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment.	Natural vegetated areas must be managed in accordance with the: Θ NEM:BA 2004	Throughout the operational phase.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Θ No provincially protected species may be destroyed/removed prior to receipt of the appropriate permits from the provincial licencing authority. Θ All vehicles must remain on demarcated roads and no unnecessary driving in the veld outside these areas may be allowed. Θ No open fires outside designated areas may be allowed on-site. Θ Spoil heaps and topsoil stockpiles must be provided with a vegetation cover of indigenous grasses. Θ All newly vegetated areas must be protected against grazing by domestic animals. Θ Monitoring of the rehabilitated area/s must take place every six months until mine closure, or for at least one growth season after closure. Photos must be taken at fixed points and must be available for auditing purposes.		
<u>Stripping of vegetation and topsoil.</u> <u>Closure of Mine.</u>	Operational and Decommissioning Phase	±62 ha	<u>Terrestrial Biodiversity and Ground Cover – Management of Invasive Plant Species</u> Θ An invasive plant species management plan (Appendix E) must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Invasive and/or alien plant species clearing must be done on an ongoing basis throughout the life of the activities.	Invasive plant species on site must be managed in accordance with the: Θ CARA, 1983 Θ NEM:BA, 2004	Throughout the operational- and decommissioning phases.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Θ No planting or importing of any alien species to the site for landscaping, rehabilitation or any other purpose may be allowed. Θ All stockpiles (topsoil & overburden) must be kept free of invasive plant species. Θ Management must take responsibility to control declared invasive and/or alien plant species on the rehabilitated areas. The following control methods can be used: ▪ The plants can be uprooted, felled, or cut off and can be destroyed completely. ▪ The plants can be treated chemically by a registered pest control officer (PCO) using an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.		
<u>Stripping of vegetation and topsoil.</u> Θ Loss of faunal habitat due to destruction of vegetation. <u>Closure of Mine</u>	Operational and Decommissioning Phases	±62 ha	<u>Fauna</u> Θ The site manager must ensure no fauna is caught, killed, harmed, sold, or played with. Θ Any fauna directly threatened by the operational activities must be removed to a safe location by the ECO or other suitably qualified person. Θ The handling and relocation of any animal perceived to be dangerous/venomous/poisonous must be undertaken by a suitably trained individual. Θ All personnel must undergo environmental induction regarding fauna management and in particular awareness about not harming or collecting species	Fauna must be managed in accordance with the: Θ NEM:BA 2004	Throughout the operational and decommissioning phases.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			such as snakes, tortoises and owls which are often persecuted out of superstition. Workers must be instructed to report any animals that may be trapped in the working area. Θ No snares may be set, or nests raided for eggs or young. Θ No litter, food or other foreign material may be thrown or left around the site. Such items must daily be removed to the site offices. Θ The excavation must include features (such as sloped edges or escape ramps) to ensure that any animals entering the area can exit safely.		
<u>Stripping of vegetation and topsoil.</u> Θ Destruction of topsoil structure. <u>Closure of Mine</u>	Operational and Decommissioning Phases	±40 ha	<u>Geology and Soil – Topsoil Management</u> Θ The upper 300 mm of the soil (if available) must be stripped and stockpiled before mining/use of a new area. Θ Topsoil is a valuable and essential resource for rehabilitation, and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes. Θ Topsoil stripping, stockpiling, and re-spreading must be done in a systematic way. The mining plan must be such that topsoil is stockpiled for the minimum possible time. Θ The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas. All topsoil heaps must be signposted.	Stockpiles must be managed in accordance with the: Θ CARA, 1983	Throughout the operational and decommissioning phases.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Θ Topsoil stockpiles must be protected against losses by water- and wind erosion. The establishment of plants (indigenous grass) on the stockpiles will help to prevent erosion. Θ Topsoil heaps may not exceed 2.5 m in height and are not to be sloped more than 1:2 to avoid collapse. Θ The topsoil stockpiles must be kept free of invasive plant species. Θ Topsoil heaps to be stored longer than a period of 3 months needs to be vegetated with an indigenous grass seed mix if vegetation does not naturally germinate within the first growth season. Θ Storm- and runoff water must be diverted around the topsoil and overburden stockpile areas to prevent erosion. Θ The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site. Θ The right holder must strive to re-instate topsoil at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, before vegetation is established, is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal. Θ An indigenous grass layer must be planted and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. It is important that rehabilitation be taken up to the point of		

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			stabilization. Rehabilitation cannot be considered complete until the first grass layer is well established. Θ Run-off water must be controlled via temporary berms, where necessary, on the slopes to ensure that accumulation of run-off does not cause down-slope erosion. Θ The rehabilitated area must be monitored for erosion and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.		
<u>Stripping of vegetation and topsoil.</u> Θ Removal of vegetation resulting in visual impacts. <u>Stripping, hauling and stockpiling of overburden.</u> Θ Visual Impacts associated with the overburden dump. <u>Workshops & Maintenance.</u> Θ Visual as a result of poor housekeeping.	Operational and Decommissioning Phases	±62 ha	<u>Visual Characteristic</u> Θ The site must always have a neat appearance and be kept in good condition. Θ Mining equipment must be stored neatly in dedicated areas when not in use. Θ The right holder must limit vegetation removal, and stripping of topsoil may only be done immediately prior to the mining/use of a specific area. Θ All excavation and mining related activities must be contained within the approved mining footprint. Θ Upon closure the site must be rehabilitated to ensure that the visual impact on the aesthetic value of the area is reduced to the minimum. Θ All buildings, equipment and/or infrastructure that will remain on the property after closure, must be left in a good and functional condition.	The mining area must be managed in accordance with the: Θ MPRDA, 2002 Θ NEMA, 1998	Throughout the operational and decommissioning phases.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<u>Salvage yard management.</u> Θ Visual as a result of poor housekeeping. <u>Waste Management.</u> Θ Visual (waste) impacts as a result of poor waste management. <u>Closure of Mine.</u>					
<u>Stripping, hauling and stockpiling of overburden.</u> Θ Dust caused by materials handling (stripping & stockpiling) and vehicle entrainment. <u>Drilling, blasting and secondary breaking.</u> Θ Dust caused by drilling and blasting.	Operational and Decommissioning Phases	±62 ha	<u>Dust Management</u> Θ The liberation of dust into the surrounding environment must be effectively controlled using, inter alia, water spraying and/or environmentally friendly dust-allaying agents that contains no PCB's (e.g. DAS products). Θ Dust suppression must continue during day and night shifts. Θ Water sprayers must be fitted to the processing plant, and the plant may not operate if these sprayers are out of order. Θ The site manager must daily assess the efficiency of all dust suppression equipment. Θ Excess dust and fines must at least weekly be removed from the processing area.	Dust generation on site must be managed in accordance with the: Θ NEM:AQA, 2004 Regulation 6(1) Θ National Dust Control Regulations, GN No R827 Θ ASTM D1739 (SANS 1137:2012)	Throughout the operational and decommissioning phases.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<u>Loading and hauling.</u> Θ Dust generation from materials handling and vehicle entrainment. <u>Crushing, screening, washing and stockpiling.</u> Θ Dust generation during crushing, screening and washing. <u>Dispatch of products from site.</u> Θ Dust caused by materials handling and vehicle entrainment on roads. Θ Social impacts from vehicles entering the mine affecting regional air quality. <u>Closure of Mine.</u>			Θ Speed on the haul roads must be limited to 20 km/h to prevent the generation of excess dust. Θ Areas devoid of vegetation, which could act as a dust source, must be minimized and vegetation removal may only be done immediately prior to mining. Θ Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and resulting impacts. Θ All dust generating activities shall comply with the National Dust Control Regulations, (GN No R827) under NEM:AQA, 2004 and ASTM D1739 (SANS 1137:2012). Θ Best practice measures shall be implemented during the stripping of topsoil, excavation, and transporting of material from site to minimize potential dust impacts. Θ Monthly fallout-dust monitoring must be implemented at the site for the duration of the activities, and the results must be compliant with the standards of the National Dust Control Regulations, 2013 (as amended). When exceedances of performance indicators are recorded the following steps must be taken and documented: ▪ Determine the source of the pollution and prevailing winds. ▪ If pollution is from the mine, determine if it is as a result of a once off incident or routine event. ▪ Determine how the incident / event can be prevented, or how it can be managed in future. Implement appropriate mitigation measures.		

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			▪ Confirm the success of mitigation through continued routine monthly sampling. ▪ If pollution continues after two months of monitoring, alternative preventative / mitigation measures must be implemented, and the success must be confirmed through routine monthly monitoring.		
<u>Stripping, hauling and stockpiling of overburden.</u> Θ Noise caused by materials handling and vehicle movement. <u>Drilling, blasting and secondary breaking.</u> Θ Noise generated during drilling and blasting. <u>Loading and hauling.</u> Θ Noise generated by materials handling and vehicular activity.	Operational and Decommissioning Phases	±62 ha	<u>Noise Management</u> Θ No loud music may be permitted at the work areas. Θ The type, duration and timing of the blasting procedures must be planned with due cognizance of other land users and structures in the vicinity. Surrounding landowners must be notified in writing prior to each blast. Θ A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008. Θ The monitoring of noise pollution during night shift must form part of the noise monitoring regime of the Quarry. If the noise pollution exceed acceptable limits (according to the monitoring specialist) corrective measures must be implemented within one month. Θ Best practice measures shall be implemented to minimize potential noise impacts.	Noise generation on site must be managed in accordance with the: Θ NEM:AQA, 2004 Regulation 6(1) Θ SANS 10103 Θ NRTA, 1996	Throughout the operational and decommissioning phases.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Crushing, screening, washing and stockpiling. Θ Noise generation during crushing, screening and stockpiling. Dispatch of products from site. Θ Noise generated by materials handling and vehicular activity. Closure of Mine.					
Stripping, hauling and stockpiling of overburden. Θ Water impacts: greater potential for increased sediment load in stormwater run-off from the overburden dumps. Crushing, screening, washing and stockpiling.	Operational and Decommissioning Phases	±62 ha	Geology and Soil – Erosion Control and Stormwater Management Θ A stormwater management plan must be implemented for the duration of the mining activities. Θ Clearing of vegetation must be limited to the mining footprint and associated infrastructure. No clearing outside of the minimum required footprint to take place. Θ Vegetation clearing activities must be put on hold when heavy rains are expected. Θ Clean stormwater must be diverted around the topsoil heaps (if possible) and mining areas to prevent erosion.	Soils and stormwater must be managed in accordance with the: Θ CARA, 1983 Θ Closure Plan (Appendix D) Θ MPRDA, 2002 Θ NEM:BA, 2004 Θ NWA, 1998	Throughout the operational and decommissioning phases.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Θ Water pollution as a result of increased sediment load in stormwater run-off from the plant area. <u>Stormwater management.</u> Θ Water pollution (sediments) – increased sediment load in stormwater run-off. <u>Closure of Mine.</u>			Θ Stockpiles must be: ▪ Located on flat, stabilised areas away from drainage lines, ▪ Covered with vegetation to reduce wind and water erosion risks. Θ When mining within steep slopes, it must be ensured that adequate slope protection is provided. Θ Roads and other disturbed areas within the project area must be regularly monitored for erosion and problem areas must receive follow-up monitoring to assess the success of the remediation. Θ Any erosion problems within the mining area because of the mining activities observed must be rectified immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur. Θ Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to stormwater management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose: ▪ Clean water (e.g. rainwater) must be kept clean and be routed to a natural area by a system separate from the dirty water system. Prevent clean water from running or spilling into dirty water systems. ▪ Dirty water must be collected and contained in a system separate from the clean water system.		

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			▪ Dirty water must be prevented from spilling or seeping into clean water systems. Θ Once shaped, all exposed/bare surfaces and embankments must be re-vegetated immediately. If revegetation of exposed surfaces cannot take place immediately, temporary erosion, and sediment control measures must be installed and maintained until such time that revegetation can commence. Θ All erosion and sediment control measures must be monitored (weekly) for the life of the operation and repaired immediately when damaged. The erosion and sediment control structures may only be removed once vegetation cover has successfully recolonised the affected areas. Θ After heavy rainfall events, site management must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gullies must be filled in with appropriate material and/or silt fences until vegetation has recolonised the rehabilitated area. Θ The runoff water from the washing plant must be directed to the settling ponds. Θ The freeboard level (0.8 m) on the settling ponds must be indicated; Θ Training sessions must be conducted to prevent the operational exceedance of this level. Θ Regular maintenance of the settling ponds side walls must be carried out to detect erosion / leakages that could influence the stability of the structure. Θ The settling ponds must be fenced to prevent unauthorised entry.		

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Θ Silt/sediment traps/barriers must be used where there is a danger of topsoil or material stockpiles eroding and entering surrounding areas. These sediment/silt barriers must regularly (at least monthly) be maintained and cleared of sediment and/or vegetation to ensure effective drainage of the areas.		
<u>Drilling, blasting and secondary breaking:</u> Θ Vibrations causing structural damage to off-site buildings. Θ Potential for fly-rock which is risk to human and fauna.	Operational Phase	±62 ha	<u>Blasting and Mining Related Maters</u> Θ Workers must have access to the correct personal protection equipment (PPE) as required by law. Θ The surrounding landowners must be informed in writing ahead of each blasting event. Θ The compliance of ground vibration and airblast levels must be monitored to USBM standards with each blasting event. Θ A vibro recorder must be used to record all blasts. Θ Audible warning of a pending blast must be given at least 3 minutes in advance of the blast. Θ Measures to limit flyrock must be taken. All flyrock (of diameter 150 mm and larger) which falls beyond the working area, together with the rock spill must be collected and removed. Θ Upon closure the entrances to the excavation must be blocked (soil berm / oversize rocks) to restrict access.	Health and safety aspects on site must be managed in accordance with the: Θ MHSA, 1996 Θ OHSA, 1993 Θ OHSAS 18001 Θ HSA,1973	Throughout the operational phase.
<u>Drilling, blasting and secondary breaking:</u>	Operational and Decommissioning Phases	±62 ha	<u>Hydrology</u> Θ All water uses applicable to the operation, as defined under the National Water Act (NWA), must be duly	All hydrology matters must be managed in accordance with the: Θ NWA, 1998	Throughout the operational and decommissioning phases.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Θ Water quality impacts generated as a result of blasting activities. <u>Water Supply and Use:</u> Θ Water loss during mining and processing. <u>Closure of Mine</u>			authorised by the Department of Water and Sanitation (DWS). A copy of the water use authorisation must be kept on-site and made available for inspection or auditing upon request. Θ Annual surface water quality monitoring must be conducted for the following: water within the quarry sump(s), the borehole and water in the final tank of the oil sump. Any deviations from acceptable water quality standards that are attributable to mining activities must be addressed without delay. In addition, water from the oil separator must be tested specifically for the presence of hydrocarbons. Θ To prevent the contamination of the environment: ▪ The employees must notify site management immediately of any pollution incidents. ▪ The contractor must prevent discharge of any pollutants, such as cement, concrete, lime chemicals and fuels into any natural areas. Θ During rehabilitation, the MR Holder must aim to restore surface water flow patterns to align with the natural drainage of the area, as far as is practically feasible.	Θ SWMP	
<u>Dispatch of products from site:</u> Θ Water pollution potentially from product spills or hydrocarbon leaks	Operational and Decommissioning Phases	±62 ha	<u>Waste Management</u> Θ Regular vehicle maintenance, repairs and services may only take place at the workshop and service area. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a	Project related waste must be managed in accordance with the: Θ NWA, 1998 Θ NEM:WA, 2008	Throughout the operational and decommissioning phases.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
associated with veichles. <u>Water supply and use:</u> Θ Surface water pollution. <u>Stormwater management:</u> Θ Water pollution (hydrocarbons) – greater potential for increased hydrocarbon pollution in stormwater run-off. <u>Sanitation handling:</u> Θ Groundwater pollution as a result of overflowing septic tank. Θ Odour as a result of overflowing septic tank. <u>Workshops & Maintenance:</u>			closed container/bin to be removed from the emergency service area (same day) to the workshop to ensure proper disposal. This waste must be treated as hazardous waste and must be disposed of at a licenced hazardous waste handling facility, alternatively collected by a registered hazardous waste handling contractor. The safe disposal certificates must be filed for auditing purposes. Θ If a diesel bowser is used on site, it must always be equipped with a drip tray and/or parked in a bunded area with impermeable surface. Drip trays must be used during each refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. Θ Ablution facilities must be provided to all employees. The ablution facilities must not cause any pollution to water sources or pose a health hazard. In addition, no form of secondary pollution should arise from the disposal of refuse or sewage. Any pollution problems arising from the above are to be addressed immediately by the MR Holder. Θ Site management must ensure drip trays are cleaned after use. The dirty rags used to clean the drip trays must be disposed as hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system. Θ Equipment/tools/vehicles placed in the salvage yard must be drained of all hydrocarbons before placement. The salvage yard must be kept clean and unwanted		

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. <u>Fuel Storage:</u> Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. <u>Salvage yard management:</u> Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. <u>Waste management:</u> Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. <u>Closure of Mine</u>			materials must be removed from the mine as regular as possible. Θ An oil spill kit/s must be available at the mine, and the employees must be trained in the emergency procedures to follow when a spill occurs as well as the application of the spill kit/s. Θ Spills must be cleaned up immediately, within two hours of occurrence, by removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a licenced facility. Proof must be filed. Θ When small volumes of wastewater are generated during the life of the project the following is applicable: ▪ Water containing waste must not be discharged into the natural environment. ▪ Measures to contain the wastewater and safely dispose thereof must be implemented. Θ It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the activities is reported to the Department of Water and Sanitation and other relevant authorities. Θ All decommissioned/rehabilitated areas must be cleared of all waste at the end of the project.		

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<u>Workshops & Maintenance:</u> Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. <u>Fuel storage:</u> Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. <u>Salvage Yard Management:</u> Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills.	Operational Phase	±62 ha	<u>Storage / Handling of Hazardous Substances / Chemicals</u> Θ All chemical stores must: ▪ Be situated on level, impermeable surfaces with secondary containment (bunding). ▪ Have a capacity to contain at least 110% of the largest stored volume, per SANS 10228. ▪ Have access to a spill kit and staff must be trained in the emergency response procedures. Θ Access to the chemicals/substances must be controlled and require prior notification of an appropriate staff member. Θ A Hazardous Substances Register must be maintained, and Material Safety Data Sheets (MSDS) must be kept current for all chemicals used on site. Θ Any fuel/used oil tanks and/or generators must have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. The bund capacity must be sufficient to contain 110% of the tank's maximum capacity. Θ The outlet valve/s of all bunded areas must always be kept closed. Θ The site manager must establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. The bund area must be inspected at least weekly and any accumulated rainwater removed and handled as	Project related chemicals/products must be managed in accordance with the: Θ HSA, 1973	Throughout the operational phase.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			contaminated water. All valves and outlets must be checked to ensure that its intact and closed securely. Θ The base of the bunded area must be sloped to direct runoff towards an appropriately sized oil sump. Contaminated water must be prevented from mixing with clean water and must be contained until it can be collected by a licenced hazardous waste handling contractor or disposed of at a licensed hazardous waste facility. Reuse of this water on site is only permitted if verified proof is available confirming that it is free of hydrocarbons. Θ Drip trays must be used underneath all stationary equipment or vehicles. Used drip trays must be placed within a bunded area and may not be stored on bare soil. The waste water originating from the cleaning of drip trays must be discarded into the oil sump, alternatively removed by the hazardous waste handling contractor. Θ No mining equipment and/or vehicles may be washed on the bare ground. Washing must be done at a formal wash bay with impermeable surface that drains to an operational oil sump. Reuse of the water from the sump is only permitted if verified proof is available confirming that it is free of hydrocarbons.		
<u>Loading and hauling.</u> <u>Dispatch of products from site.</u>	Operational Phase	±2.5 km	<u>Access Road Management</u> Θ Vehicular movement must be restricted to the roads and crisscrossing of tracks through undisturbed areas must be prohibited.	The access road must be managed in accordance with the: Θ NRTA, 1996	Throughout the operational phase.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Θ Rutting and erosion of the access and internal roads caused as a direct result of the mining activities must be repaired by the MR Holder. Θ Overloading of the trucks must be prevented, and proof of load weights must be filed for auditing purposes.		
Stripping of vegetation and topsoil. Stripping, hauling and stockpiling of overburden. Drilling, blasting and secondary breaking.	Operational Phase	±62 ha	Cultural and Heritage Environment Θ All mining must be confined to the development footprint area. Θ If during the operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. Θ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. Θ The senior on-site Manager must inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who must notify the PHRA-EC. Θ Work may only continue once the go-ahead was issued by PHRA-EC.	Cultural/heritage aspects must be managed in accordance with the: Θ NHRA, 1999	Throughout the operational phase.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Θ Should any suspected palaeontological material be at any time encountered during mining, a palaeontologist should likewise be immediately contacted to sample and record such occurrence.		
Closure of Mine	Decommissioning Phase	±62 ha	Rehabilitation / Landscaping of the Mining Area Θ When possible, excavations and/or disturbed areas must be subject to progressive rehabilitation. Θ Rehabilitation must be done to such a standard that the rehabilitated land surrounding the excavation can revert to grazing. Θ The excavated areas must serve as a final depositing area for the placement of overburden. Θ Rocks and coarse material removed from the excavation must be returned to the excavation. Θ Coarse natural material used for the construction of ramps must be removed and dumped into the excavation. Θ Stockpiles must be removed during the decommissioning phase, the area ripped, and the topsoil returned to its original depth to provide a growth medium. Θ No waste may be permitted to be deposited in the excavation. Θ Once overburden, rocks and coarse natural materials have been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.	The mining area must be closed in accordance with the: Θ MPRDA, 2002 Θ Closure Plan	Throughout the decommissioning phase.

ACTIVITY & IMPACT	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			Θ The site shall be seeded with a local or adapted indigenous seed mix to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within six months from closure of the site. Θ If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a vegetation seed mix to his or her specification. Θ Rehabilitation success must be measured by: ▪ At least 70% vegetation cover with indigenous grass species within 12 months of seeding. ▪ Stabilization of slopes to a gradient of 1:3 to prevent erosion. ▪ Regular monitoring for invasive species, with removal interventions implemented quarterly. Θ The entrances to the quarry pit must be adequately blocked to prevent unauthorised access to humans and domestic animals.		

c) ADMINISTRATION OF ENVIRONMENTAL OBLIGATIONS

Copies of this EMPR must be kept at the site office and must be distributed to all senior contract personnel who shall familiarise themselves with its contents. The implementation of the EMPR requires the involvement of all site personnel, to ensure sound environmental management during the operational and decommissioning phases of the project.

1. MINING RIGHT HOLDER

The mining right holder, Aliwal Dolerite Quarry (Pty) Ltd, and anyone acting on behalf of the MR Holder, is accountable for the potential environmental impacts of all activities undertaken and is responsible for the management of the impacts as well as the implementation of the EMPR.

2. SUB-CONTRACTORS

All sub-contractors (when applicable) must receive a copy of the EMPR and be inducted by the MR Holder's representative prior to commencement on site. All sub-contractors that enter the mining area must comply with the requirements of the EMPR and ensure compliance of his/her employees.

3. ENVIRONMENTAL CONTROL OFFICER (ECO)

The holder of the mining right must appoint a site based environmental control officer (ECO). The ECO must be readily available on site at all times to ensure that all activities are conducted in compliance with the approved EMPR.

The ECO must:

- Θ Keep and maintain a detailed incident register (including any spillages or fuel, chemicals and any other materials).
- Θ Keep a complaints register on site indicating the complaint and how the issues were addressed, what measures were taken and what preventative measures were implemented to avoid re-occurrence of complaints.
- Θ Keep records relating to monitoring and auditing and site and avail them for inspection to any relevant authorised officials.
- Θ Keep copies of all environmental reports submitted to the DMPR.
- Θ Keep the records of all permits, licenses and authorisations required by the operation.
- Θ Compile a monthly monitoring report and make it available to the DMPR if requested.

- The duties and responsibility of the ECO must not be seen as exempting the holder of the mining right from the legal obligations in terms of the MPRDA and/or NEMA.

4. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

The holder of the mining right must annually appoint an independent environmental specialist (EAP) to objectively assess the compliance of the mining operations with the conditions of the approved EMPR. The EAP must at least annually report on the compliance of the mine to the DMPR, unless otherwise stipulated by the department.

(APPENDIX 4 SECTION 1(1)(e) & (f))

H. IMPACT MANAGEMENT ACTIONS AND OUTCOMES

Table 12: Impact Management Actions and Outcomes.

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Θ Stripping of vegetation and topsoil.	Θ Destruction of vegetation	This will impact on the biodiversity of the receiving environment.	Operational Phase	Control: Implementing proper housekeeping and the mitigation measures.	Natural vegetated areas must be managed in accordance with the: Θ NEM:BA 2004
Θ Stripping of vegetation and topsoil. Θ Closure of Mine	Θ Infestation of the mining area with invasive plant species.	Infestation of the footprint by invasive and/or alien plant species may affect the biodiversity of the receiving environment.	Operational and Decommissioning Phases	Control & Remedy: Implementation of an invasive plant species management plan.	Invasive plant species on site must be managed in accordance with the: Θ CARA, 1983 Θ NEM:BA, 2004
Θ Stripping of vegetation and topsoil. Θ Closure of Mine	Θ Loss of faunal habitat due to destruction of vegetation.	This will impact on the biodiversity of the receiving environment.	Operational and Decommissioning Phases	Control: Implementing proper housekeeping and the mitigation measures.	Fauna must be managed in accordance with the: Θ NEM:BA 2004
Θ Stripping of vegetation and topsoil. Θ Closure of Mine	Θ Destruction of topsoil structure.	The loss of topsoil will affect the effective rehabilitation of the mined areas.	Operational and Decommissioning Phases	Control: Implementing proper topsoil management measures.	Stockpiles must be managed in accordance with the: Θ CARA, 1983

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Θ Stripping of vegetation and topsoil. Θ Stripping, hauling and stockpiling of overburdern. Θ Workshops & Maintenance. Θ Salvage yard management. Θ Waste Management Θ Closure pf Mine	Θ Removal of vegetation resulting in visual impacts. Θ Visual Impacts associated with the overburden dump. Θ Visual as a result of poor housekeeping. Θ Visual as a result of poor housekeeping. Θ Visual (waste) impacts as a result of poor waste management.	The visual impact may affect the aesthetics of the landscape.	Operational and Decommissioning Phases	Control: Implementing proper housekeeping and progressive rehabilitation (when possible).	The mining area must be managed in accordance with the: Θ MPRDA, 2008 Θ NEMA, 1998
Θ Stripping, hauling and stockpiling of overburden. Θ Drilling, blasting and secondary breaking. Θ Loading and hauling. Θ Crushing, screening, washing and stockpiling.	Θ Dust caused by materials handling (stripping & stockpiling) and vehicle entrainment. Θ Dust caused by drilling and blasting. Θ Dust generation from materials handling and vehicle entrainment.	Increased dust generation will impact on the air quality of the receiving environment.	Operational and Decommissioning Phases	Control: Dust suppression methods, monitoring and proper housekeeping.	Dust generation on site must be managed in accordance with the: Θ NEM:AQA, 2004 Regulation 6(1) Θ National Dust Control Regulations, GN No R827 Θ ASTM D1739 (SANS 1137:2012)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Θ Dispatch of products from site. Θ Closure of Mine	Θ Dust generation during crushing, screening and washing. Θ Dust caused by materials handling and vehicle entrainment on roads. Θ Social impacts from vehicles entering the mine affecting regional air quality.				
Θ Stripping, hauling and stockpiling of overburden. Θ Drilling, blasting and secondary breaking. Θ Loading and hauling. Θ Crushing, screening, washing and stockpiling. Θ Dispatch of products from site. Θ Closure of Mine	Θ Noise caused by materials handling and vehicle entrainment. Θ Noise generated during drilling and blasting. Θ Noise generated by materials handling and vehicular activity. Θ Noise generation during crushing, screening and stockpiling. Θ Noise generated by materials handling and vehicular activity.	Should noise levels become excessive it may have an impact on the noise ambiance of the receiving environment.	Operational and Decommissioning Phases	<u>Control:</u> Noise suppression methods, monitoring and proper housekeeping.	Noise generation on site must be managed in accordance with the: Θ NEM:AQA, 2004 Regulation 6(1) Θ SANS 10103 Θ NRTA, 1996

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Θ Stripping, hauling and stockpiling of overburden. Θ Crushing, screening, washing and stockpiling. Θ Stormwater management. Θ Closure of Mine	Θ Water impacts: greater potential for increased sediment load in stormwater run-off from the overburden dumps. Θ Water pollution as a result of increased sediment load in stormwater run-off from the plant area. Θ Water pollution (sediments) – increased sediment load in stormwater run-off.	These impacts could affect the hydrology of the receiving environment and/or cause erosion.	Operational and Decommissioning Phases	Control: Implementing a SWMP.	Soils and stormwater must be managed in accordance with the: Θ CARA, 1983 Θ Closure Plan (Appendix D) Θ MPRDA, 2002 Θ NEM:BA, 2004 Θ NWA, 1998
Θ Drilling, blasting and secondary breaking.	Θ Vibrations causing structural damage to off-site buildings. Θ Potential for fly-rock which is risk to human and fauna.	Blasting related impacts may affect the labour force, as well as pose a threat to animals and humans that may enter the mining footprint.	Operational Phase	Stop & Control: Adherance to the blasting rules and regulations, monitoring of blasting events. Demarcation of the mining area and proper housekeeping.	Health and safety aspects on site must be managed in accordance with the: Θ MHSA, 1996 Θ OHSA, 1993 Θ OHSAS 18001 Θ HSA,1973
Θ Drilling, blasting and secondary breaking. Θ Water Supply and Use. Θ Closure of Mine	Θ Water quality impacts generated as a result of blasting activities.	These impacts could affect the hydrology of the receiving environment.	Operational and Decommissioning Phases	Control & Remedy: Proper housekeeping, water monitoring and implementation of an emergency response plan and waste management plan.	All hydrology matters must be managed in accordance with the: Θ NWA, 1998 Θ SWMP

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	Θ Water loss during mining and processing.				
Θ Dispatch of products from site. Θ Water supply and use. Θ Stormwater management. Θ Sanitation handling. Θ Workshops & Maintenance. Θ Fuel Storage Θ Salvage yard management. Θ Waste management. Θ Closure of Mine	Θ Water pollution potentially from product spills or hydrocarbon leaks associated with veichles. Θ Surface water pollution. Θ Water pollution (hydrocarbons) – greater potential for increased hydrocarbon pollution in stormwater run-off. Θ Groundwater pollution as a result of overflowing septic tank. Θ Odour as a result of overflowing septic tank. Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills.	Contamination of the footprint areas will negatively impact the soil, surface runoff and potentially the groundwater. It will also incur additional costs to the Right Holder.	Operational and Decommissioning Phase	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	Project related waste must be managed in accordance with the: Θ NWA, 1998 Θ NEM:WA, 2008

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills.				

(APPENDIX 4 SECTION 1(1)(g) – (k))

MECHANISMS FOR MONITORING COMPLIANCE WITH AND PERFORMANCE ASSESSMENT AGAINST THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND REPORTING THEREON, INCLUDING

I. MONITORING OF IMPACT MANAGEMENT ACTIONS

J. MONITORING AND REPORTING FREQUENCY

K. RESPONSIBLE PERSONS

L. TIME PERIOD FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS

M. MECHANISMS FOR MONITORING COMPLIANCE

Table 13: Mechanisms for monitoring compliance with and performance assessment against the EMPR and reporting thereon.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Θ Demarcation of site with visible beacons.	<u>General</u> Θ Maintenance of beacons.	Θ Visible beacons / fences indicating the boundary of the mineable areas.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent Environmental Assessment Practitioner (EPA) during the annual environmental audit.	Applicable throughout operational-, and decommissioning phases. Θ Daily compliance monitoring by site management and ECO. Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			<u>Mitigation / Monitoring to be Implemented:</u> Θ Ensure beacons / fences are in place throughout the life of the mine.	
Θ Stripping of vegetation and topsoil.	<u>Terrestrial biodiversity, and groundcover</u> Θ Destruction of vegetation.	Θ Visible beacons / fences indicating the boundary of the mineable areas. Θ Environmental awareness training material. Θ Plant destruction/removal permits (when applicable). Θ Fire management plan. Θ Alien invasive species management plan. Θ Cover crop to seed rehabilitated areas.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Clearly demarcate the mining boundaries and contain all operations to the approved mining area. Declare the area outside the mining boundaries a no-go area and educate all staff accordingly. Θ Commit to a conservation approach and keep the actual footprint of disturbance to a minimum. Θ Arrange environmental induction for all staff on site to ensure that basic environmental principles are adhered to. This must include awareness of littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated areas, etc. Θ Do not burn cleared vegetation but rather mulch and stockpiled it. Ideally cover the heaps with stockpiled	Applicable throughout and operational phase. Θ Daily compliance monitoring by site management and ECO. Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			topsoil and retain the material for future site rehabilitation. Θ Arrange that the ECO provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment. Θ Do not destroyed/removed provincially protected species prior to receipt of the appropriate permits from the provincial licencing authority. Θ Ensure all vehicles remain on demarcated roads and prevent unnecessary driving in the veld outside these areas. Θ Do not allow open fires outside designated areas. Θ Provide spoil heaps and topsoil stockpiles with a vegetation cover of indigenous grasses. Θ Protect all newly vegetated areas against grazing by domestic animals. Θ Monitor the rehabilitated area/s every six months until mine closure, or for at least one growth season after closure. Take photos at fixed points and keep records available for auditing purposes.	
Θ Stripping of vegetation and topsoil. Θ Closure of Mine.	<u>Terrestrial biodiversity, and groundcover</u> Θ Infestation of the mining area with invasive plant species.	Θ Alien invasive plant species management plan. Θ Designated team to cut or pull-out invasive plant species that germinated on site.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit.	Applicable throughout operational-, and decommissioning phases. Θ Daily compliance monitoring by site management and ECO.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
		Θ Contact details of a Pest Control Officer.	<u>Mitigation / Monitoring to be Implemented:</u> Θ Implement an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. Do invasive and/or alien plant species clearing throughout the life of the mining activities. Θ Do not allow planting or importing of any alien species to the site for landscaping, rehabilitation, or any other purpose. Θ Keep all stockpiles (topsoil & overburden) free of invasive plant species. Θ Control declared invasive and/or alien plant species on the rehabilitated areas through one of the following: ▪ The plants can be uprooted, felled, or cut off and can be destroyed completely. ▪ The plants can be treated chemically by a registered pest control officer (PCO) using an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.	Θ Annual compliance monitoring by independent EAP.
Θ Stripping of vegetation and topsoil. Θ Closure of Mine.	<u>Fauna</u> Θ Loss of faunal habitat due to destruction of vegetation.	Θ Visible beacons / fences demarcating the mining area. Θ Environmental awareness training material.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit.	Applicable throughout operational phase. Θ Daily compliance monitoring by site management and ECO.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
		Θ Snake posters. Θ Refuse bins with lids.	<u>Mitigation / Monitoring to be Implemented:</u> Θ Ensure no fauna is caught, killed, harmed, sold, or played with. Θ The ECO or other suitably qualified person must remove any fauna directly threatened by the operational activities to a safe location. Θ Arrange a suitably qualified individual to handle and relocation any animal perceived to be dangerous/venomous/poisonous. Θ Arrange that all personnel undergo environmental induction regarding fauna management and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. Instruct workers to report any animals that may be trapped in the working area. Θ Ensure no snares are set or nests raided for eggs or young. Θ Prevent litter, food or other foreign material thrown or left around the site. Daily remove such items to the site offices. Θ Add features (such as sloped edges or escape ramps) to all excavation to ensure any animals entering the area can exit safely.	Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Θ Stripping of vegetation and topsoil. Θ Closure of Mine.	<u>Geology and Soil</u> Θ Destruction of topsoil structure.	Θ Earthmoving equipment to strip, stockpile and spread the topsoil. Θ Signage to identify Topsoil Stockpiles. Θ Stormwater control infrastructure. Θ Designated team to control invasive and/or alien plant species that may germinate on the topsoil heaps. Θ Cover crop to vegetate topsoil heaps (when needed) and reinstated soil.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Strip and stockpile the upper 300 mm (if available) of the soil before mining or use of a new area. Θ Carefully manage and conserve the topsoil throughout the stockpiling and rehabilitation process. Θ Ensure topsoil stripping, stockpiling, and re-spreading is done in a systematic way. Plan mining in such a way that topsoil is stockpiled for the minimum possible time. Θ Place the topsoil on a levelled area, within the mining footprint. Do not stockpile topsoil in undisturbed areas. Θ Protect topsoil stockpiles against losses by water- and wind erosion. The establishment of plants (indigenous grass) on the stockpiles will help to prevent erosion. Θ Ensure that topsoil heaps do not exceed 2.5 m and not sloped more than 1:2 to avoid collapse. Θ Keep topsoil stockpiles free of invasive plant species. Θ Vegetate the topsoil heaps to be stored longer than 3 months with an indigenous grass seed mix if vegetation does not naturally germinate within the first growth season.	Applicable throughout operational and decommissioning phases. Θ Daily compliance monitoring by site management and ECO. Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			Θ Divert storm- and runoff water around the on-site stockpile area to prevent erosion. Θ Spread the topsoil evenly, to a depth of 300 mm, over the rehabilitated area upon closure of the site. Θ Strive to re-instate topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, to that erosion of returned topsoil is minimized. The best time of year is at the end of the rainy season. Θ Plant an indigenous grass layer immediately after spreading topsoil to stabilise the soil and protect it from erosion. Rehabilitation extends until the first grass layer is well established. Θ Control run-off water with temporary banks, where necessary, to prevent accumulation of run-off causing down-slope erosion. Θ Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after reinstatement.	
Θ Stripping of vegetation and topsoil. Θ Stripping, hauling and stockpiling of overburden.	<u>Visual Characteristics</u> Θ Removal of vegetation resulting in visual impacts. Θ Visual Impacts associated with the overburden dump.	Θ Parking- and dedicated storage areas for equipment. Θ Good housekeeping practices.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit.	Applicable throughout operational-, and decommissioning phases. Θ Daily compliance monitoring by site management and ECO.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Θ Workshops & Maintenance. Θ Salvage yard management. Θ Waste Management. Θ Closure of Mine.	Θ Visual as a result of poor housekeeping. Θ Visual as a result of poor housekeeping. Θ Visual (waste) impacts as a result of poor waste management.		<u>Mitigation / Monitoring to be Implemented:</u> Θ Ensure that the site has a neat appearance and is always kept in good condition. Θ Store mining equipment neatly in dedicated areas when not in use. Θ Limit vegetation removal and only do stripping of topsoil immediately prior to the mining/use of a specific area. Θ Contain the excavation within the approved footprint of the permitted area. Θ Upon closure, rehabilitate the site and reduce the residual visual impacts to the minimum. Θ Leave all buildings, equipment and/or infrastructure that will remain on the property after closure in a good and functional condition.	Θ Annual compliance monitoring by independent EAP.
Θ Stripping, hauling and stockpiling of overburden. Θ Drilling, blasting and secondary breaking. Θ Loading and hauling.	<u>Air Quality and Noise Ambiance</u> Θ Dust caused by materials handling (stripping & stockpiling) and vehicle entrainment. Θ Dust caused by drilling and blasting.	Θ Dust suppression equipment such as a water car, water dispenser and sprayers on the crusher plant. Θ Signage that clearly reduce the speed on the internal roads.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Control the liberation of dust into the surrounding environment using; inter alia, water spraying and/or other dust-allaying agents.	Applicable throughout operational-, and decommissioning phases. Θ Daily compliance monitoring by site management and ECO. Θ Weekly monitoring of dust and fines at the processing area.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Θ Crushing, screening, washing and stockpiling. Θ Dispatch of products from site. Θ Closure of Mine	Θ Dust generation from materials handling and vehicle entrainment. Θ Dust generation during crushing, screening and washing. Θ Dust caused by materials handling and vehicle entrainment on roads. Θ Social impacts from vehicles entering the mine affecting regional air quality.	Θ Maintenance schedule to remove excess dust from the processing area. Θ Cover crop to re-vegetate denuded areas.	Θ Ensure dust suppression continue during day and night shifts. Θ Fit water sprayers to the processing plant and stop operations if the sprayers are out of order. Θ Ensure continuous (daily) assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. Θ Remove excess dust and fines at least weekly from the processing area. Θ Limit speed on the haul roads to 20 km/h to prevent the generation of excess dust. Θ Minimise areas devoid of vegetation and only remove vegetation immediately prior to mining. Θ Consider weather conditions upon commencement of daily operations. Limit operations during very windy periods to reduce airborne dust and resulting impacts. Θ Ensure dust generating activities comply with the National Dust Control Regulations, (GN No R827) under NEM:AQA, 2004 and ASTM D1739 (SANS 1137:2012). Θ Implement best practice measures during the stripping of topsoil, excavation, and transporting of material from site to minimize potential dust impacts. Θ Implement monthly fallout-dust monitoring at the site for the duration of the activities and ensure the results are compliant with the standards of the National Dust Control Regulations, 2013 (as amended). When exceedances of performance indicators are recorded take the following steps and document outcomes:	Θ Monthly fallout dust monitoring by qualified service provider. Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			▪ Determine the source of the pollution and prevailing winds. ▪ If pollution is from the mine, determine if it is as a result of a once off incident or routine event. ▪ Determine how the incident / event can be prevented, or how it can be managed in future. Implement appropriate mitigation measures. ▪ Confirm the success of mitigation through continued routine monthly sampling. ▪ If pollution continues after two months of monitoring, implement alternative preventative / mitigation measures, and confirm the success through routine monthly monitoring.	
Θ Stripping, hauling and stockpiling of overburden. Θ Drilling, blasting and secondary breaking. Θ Loading and hauling. Θ Crushing, screening, washing and stockpiling.	<u>Air Quality and Noise Ambiance</u> Θ Noise caused by materials handling and vehicle movement. Θ Noise generated during drilling and blasting. Θ Noise generated by materials handling	Θ Personal noise exposure monitoring equipment. Θ Signage indicating noise zones.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Do not permit loud music at the mining area. Θ Plan the type, duration, and timing of the blasting procedures with due cognizance of other land users and structures in the vicinity. Notify the surrounding landowners in writing prior to each blasting occasion.	Applicable throughout operational-, and decommissioning phases. Θ Daily compliance monitoring by site management and ECO. Θ Quarterly reporting by a qualified occupation hygienist. Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Θ Dispatch of products from site. Θ Closure of Mine	and vehicular activity. Θ Noise generation during crushing, screening and stockpiling. Θ Noise generated by materials handling and vehicular activity.		Θ Contract a qualified occupational hygienist to quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring must be in accordance with SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA 2004, SANS 10103:2008. Θ Make the monitoring of noise pollution during night shift part of the noise monitoring regime of the Quarry. If the noise pollution exceed acceptable limits (according to the monitoring specialist) implement corrective actions within one month. Θ Implement best practice measures to minimise potential noise impacts.	
Θ Stripping, hauling and stockpiling of overburden. Θ Crushing, screening, washing and stockpiling. Θ Stormwater management. Θ Closure of Mine	<u>Geology and Soil</u> Θ Water impacts: greater potential for increased sediment load in stormwater run-off from the overburden dumps. Θ Water pollution as a result of increased sediment load in stormwater run-off from the plant area.	Θ Stormwater management plan. Θ Stormwater control structures such as berms to direct storm- and runoff water around the stockpiled topsoil area.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Implement a stormwater management plan for the duration of the mining activities. Θ Limit clearing of vegetation to the mining footprint and associated infrastructure. Ensure no clearing takes place outside the minimum required footprint. Θ Place vegetation clearing on hold when heavy rains are expected.	Applicable throughout operational-, and decommissioning phases. Θ Daily compliance monitoring by site management and ECO. Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	Θ Water pollution (sediments) – increased sediment load in stormwater run-off.		Θ Divert clean stormwater around the topsoil heaps (if possible) and mining areas to prevent erosion. Θ Implement the following regarding stockpiles: ▪ Locate on flat, stabilised areas away from drainage lines, ▪ Cover with vegetation to reduce wind and water erosion risks. Θ Ensure that adequate slope protection is provided when mining within steep slopes. Θ Regularly monitor roads and other disturbed areas within the project for erosion and ensure problem areas receive follow-up monitoring to assess the success of the remediation. Θ Rectify erosion problems within the mining area because of the mining activities immediately (within 48 hours) and monitored thereafter to ensure that it does not re-occur. Θ Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS: ▪ Clean water (e.g. rainwater) must be kept clean and be routed to a natural area by a system separate from the dirty water system. Prevent clean water from running or spilling into dirty water systems. ▪ Dirty water must be collected and contained in a system separate from the clean water system. ▪ Dirty water must be prevented from spilling or seeping into clean water systems. Θ Re-vegetate all exposed/bare surfaces and embankments once shaped. If revegetation of exposed surfaces cannot take place immediately, temporary	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			erosion, and sediment control measures must be installed and maintained until such time that revegetation can commence. Θ Monitor all erosion and sediment control measures weekly for the life of the operation and repaired immediately when damaged. Only remove the erosion and sediment control structures once vegetation cover has successfully recolonised the affected areas. Θ After heavy rainfall events, check the site for erosion damage and rehabilitate this damage immediately. Fill in erosion rills and gullies with appropriate material and/or silt fences until vegetation has recolonised the rehabilitated area. Θ Direct the runoff water from the washing plant to the settling ponds. Θ Indicate the freeboard level (0.8 m) on the settling ponds. Θ Conduct training sessions to prevent the operational exceedance of this level. Θ Do regular maintenance of the settling ponds side walls to detect erosion / leakages that could influence the stability of the structure. Θ Fence the settling ponds to prevent unauthorised entry. Θ Use silt/sediment traps/barriers where there is a danger of topsoil or material stockpiles eroding and entering surrounding areas. Regularly (at least monthly) maintain and clean these sediment/silt barriers of sediment and/or vegetation to ensure effective drainage of the areas.	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Θ Drilling, blasting and secondary breaking.	<u>Blasting and Mining Related Matters:</u> Θ Vibrations causing structural damage to off-site buildings. Θ Potential for fly-rock which is risk to human and fauna.	Θ Vibro recorder. Θ Blasting notifications. Θ Stocked first aid box. Θ Level 1 certified first aider. Θ Oversize rocks/soil berms or other material to block entrance into the pit.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Ensure that workers have access to the correct PPE as required by law. Θ Inform the surrounding landowners and communities in writing ahead of any blasting event. Θ Monitor the compliance of ground vibration and airblast levels to USBM standards with each blasting event. Θ Record all blasts with a vibro recorder. Θ Give audible warning of a pending blast at least 3 minutes in advance of the blast. Θ Limit fly rock and collect and remove flyrock and rock spill that falls beyond the working area. Θ Block the entrance into the excavation upon closure to restrict access.	Applicable throughout the operational phase. Θ Daily compliance monitoring by site management and ECO. Θ Monitoring of each blast by an appropriately qualified person. Θ Annual compliance monitoring by independent EAP.
Θ Drilling, blasting and secondary breaking.	<u>Hydrology</u> Θ Water quality impacts generated	Θ Copy of Water Use Authorisation (if needed). Θ Surface water quality monitoring results.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance.	Applicable throughout operational-, and decommissioning phases.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Θ Water Supply and Use. Θ Closure of Mine	as a result of blasting activities. Θ Water loss during mining and processing.	Θ Emergency Response Plan Θ Waste Management Plan Θ Stormwater Management Plan	Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Ensure all water uses applicable to the operation, as defined under the NWA, are authorised by the DWS. Keep a copy of the water use authorisation on-site for inspection or auditing purposes. Θ Conduct annual surface water quality monitoring for the following: water within the quarry sump(s), the borehole and water in the final tank of the oil sump. Address any deviations from acceptable water quality standards that are attributable to mining activities without delay. In addition, test the water from the oil separator specifically for the presence of hydrocarbons. Θ To prevent the contamination of the environment: ▪ Instruct employees to notify site management immediately of pollution incidents. ▪ Prevent discharge of any pollutants, such as cement, concrete, lime chemicals and fuels into natural areas. Θ During rehabilitation, aim to restore surface water flow patterns to align with the natural drainage of the area, as far as is practically feasible.	Θ Daily compliance monitoring by site management and ECO. Θ Annual compliance monitoring by independent EAP.
Θ Dispatch of products from site.	<u>Waste Management</u> Θ Water pollution potentially from	Θ Waste management plan.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance.	Applicable throughout operational-, and decommissioning phases.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Θ Water supply and use. Θ Stormwater management. Θ Sanitation handling. Θ Workshops & Maintenance. Θ Fuel Storage. Θ Salvage yard management. Θ Waste management. Θ Closure of Mine	product spills or hydrocarbon leaks associated with veichles. Θ Surface water pollution. Θ Water pollution (hydrocarbons) – greater potential for increased hydrocarbon pollution in stormwater run-off. Θ Groundwater pollution as a result of overflowing septic tank. Θ Odour as a result of overflowing septic tank. Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills.	Θ Formal waste disposal system with waste registers. Θ Drip trays. Θ Covered refuse bins for both hazardous- and general waste. Θ Oil spill kit. Θ Bunded areas with impermeable surface. Θ Stormwater management plan.	Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Ensure that regular vehicle maintenance, repairs and services only take place at the workshop and service area. If emergency repairs are needed on equipment not able to move to the workshop, ensure drip trays are present. Dispose all waste products in a closed container/bin and remove it from the emergency service area (same day) to the workshop to ensure proper disposal. Treat this waste as hazardous waste and disposed of it at a licenced hazardous waste handling facility, alternatively arrange collection by a registered hazardous waste handling contractor. File the safe disposal certificates for auditing purposes. Θ If a diesel bowser is used on site, always equip it with a drip tray and ensure that it is parked in a bunded area with impermeable surface. Use drip trays during each refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. Θ Provide ablution facilities to all employees. Ensure that the ablution facilities do not cause any pollution to water sources or pose a health hazard. In addition, no form of secondary pollution may arise from the disposal of refuse or sewage. Any pollution problems arising from the above are to be addressed immediately by the MR Holder.	Θ Daily compliance monitoring by site management and ECO. Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills.		Θ Ensure drip trays are cleaned after use. Dispose of dirty rags used to clean the drip trays as hazardous waste into a designated bin at the workshop, where it is incorporated into the hazardous waste removal system. Θ Drain hydrocarbons from equipment/tools/vehicles placed in the salvage yard. Keep the salvage yard clean and remove unwanted materials from the mine as regular as possible. Θ Obtain an oil spill kit/s and train the employees in the emergency procedures to follow when a spill occurs as well as the application of the spill kit/s. Θ Clean spills immediately, within two hours of occurrence by removing the spillage together with the polluted soil and containing it in a designated hazardous waste bin until it is disposed of at a registered facility. File proof. Θ Do not discharge water containing waste into the natural environment. Θ Implement measures to contain the wastewater and safely dispose thereof. Θ Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the Department of Water and Sanitation and other relevant authorities. Θ Clean all decommissioned / rehabilitated areas of all waste at the end of the project.	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Θ Workshops & Maintenance. Θ Fuel storage. Θ Salvage Yard Management.	<u>Storage / Handling of Hazardous Substances / Chemicals</u> Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills. Θ Water pollution (hydrocarbon spills) as a result of hydrocarbon spills.	Θ Waste management plan. Θ Formal waste disposal system with waste registers. Θ Drip trays. Θ Covered refuse bins for both hazardous- and general waste. Θ Oil spill kit. Θ Bunded areas with impermeable surface. Θ Material Safety Data Sheets Θ Formal inspection routine/programme.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Ensure that all chemical stores: ▪ Are situated on level, impermeable surfaces with secondary containment (bunding). ▪ have a capacity to contain at least 110% of the largest stored volume, per SANS 10228. ▪ Have access to a spill kit and staff must be trained in the emergency response procedures. Θ Control access to the chemicals/substances and require prior notification of an appropriate staff member. Θ Maintain a Hazardous Substances Register and keep the Material Safety Data Sheets (MSDS) current for all chemicals used on site. Θ Ensure all fuel/used oil tanks and/or generators have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. The bund capacity must be sufficient to contain 110% of the tank's maximum capacity.	Applicable throughout the operational phase. Θ Daily compliance monitoring by site management and ECO. Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			Θ Ensure that the outlet valve/s of all bunded areas are always kept closed. Θ Establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. Inspect the bund area at least weekly and remove any accumulated rainwater. Handle as contaminated water. Check all valves and outlets to ensure that its intact and closed securely. Θ Slope the base of the bunded area to direct runoff towards an appropriately sized oil sump. Prevent contaminated water from mixing with clean water and contained it until collected by a registered hazardous waste handling contractor or disposed of at a licensed hazardous waste facility. Only reuse this water on site if verified proof is available confirming that it is free of hydrocarbons. Θ Use drip trays underneath all stationary equipment or vehicles. Used drip trays must be placed within a bunded area and may not be stored on bare soil. The waste water originating from the cleaning of drip trays must be discarded into the oil sump, alternatively removed by the hazardous waste handling contractor. Θ Do not wash mining equipment and/or vehicles on the bare ground. Washing must be done at a formal wash bay with impermeable surface that drains to an operational oil sump. Only reuse the water from the sump if verified proof is available confirming that it is free of hydrocarbons.	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Θ Loading and hauling. Θ Dispatch of products from site.	<u>Access Road Management.</u>	Θ Earthmoving equipment to maintain the gravel pavement structure of the roads. Θ Road signage to control traffic speed. Θ Proof of load weights to prevent overloading.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Restrict vehicular movement to the existing access road to prevent crisscrossing of tracks through undisturbed areas. Θ Repair rutting and erosion of the access road caused as a direct result of the mining activities. Θ Prevent overloading of trucks and file proof of load weights for auditing purposes.	Applicable throughout operational phase. Θ Daily compliance monitoring by site management and ECO. Θ Annual compliance monitoring by independent EAP.
Θ Stripping of vegetation and topsoil. Θ Stripping, hauling and stockpiling of overburden. Θ Drilling, blasting and secondary breaking.	<u>Cultural and Heritage Environment</u>	Θ Contact number of an archaeologist & palaeontologist that can be contacted when a discovery is made on site.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Confine all mining to the development footprint area. Θ Implement the following change find procedure when discoveries are made on site:	Applicable throughout operational phase. Θ Daily compliance monitoring by site management and ECO. Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			▪ If during the operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ▪ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. ▪ The senior on-site Manager must inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who must notify the SAHRA. ▪ Work may only continue once the go-ahead was issued by SAHRA. ▪ Should any suspected palaeontological material be at any time encountered during mining, a palaeontologist should likewise be immediately contacted to sample and record such occurrence.	
Θ Stripping of vegetation and topsoil.	<u>Fire Management</u>	Θ Fire beaters and -extinguishers.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance.	Applicable throughout operational phase.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Θ Stripping, hauling and stockpiling of overburden. Θ Drilling, blasting and secondary breaking. Θ Loading and hauling. Θ Crushing, screening, washing and stockpiling. Θ Dispatch of products from site. Θ Closure of Mine		Θ Toolbox talks and emergency preparedness plan. Θ Contact number of the fire association/-brigade.	Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ Restrict contained fires for heating and cooking (i.e. in a fire drum) to designated areas. Θ Prevent employees from setting fires randomly outside designated areas. Θ Do not store fuel or chemicals under trees. Θ Do not store gas in the same storage area as liquid fuel. Θ Designate smoking to specific areas (>3 m from fuel or chemical storage areas) equipped with sand buckets for the disposal of cigarette buds. Θ Ensure the mine is equipped with adequate firefighting equipment. This includes at least rubber beaters when working in veld areas, and fire extinguishers of the appropriate type. Θ Implement specific fire safety precautions during welding activities associated with construction work. Ensure a working fire extinguisher is immediately at hand if any “HOT WORK” is undertaken e.g. welding, grinding, gas cutting etc, Θ Report any fires noted on site to the responsible SHE rep and/or fire officer. Θ Implement fire emergency procedures for the duration of the operational-, and decommissioning phases. Θ In the event of large fires ensure that all personnel assemble at a safe assembly point to be transported	Θ Daily compliance monitoring by site management and ECO. Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			from site. Inform the fire department or local fire watch of the fire to ensure that the fire is brought under control as soon as possible.	
Θ Closure of Mine	<u>Topography</u>	Θ Earthmoving equipment to rehabilitate mined areas.	<u>Responsible Person:</u> Θ Site Manager and ECO to ensure day-to-day compliance. Θ Compliance to be monitored by the independent EAP during the annual environmental audit. <u>Mitigation / Monitoring to be Implemented:</u> Θ When possible, implement progressive rehabilitation of excavations and/or disturbed areas. Θ Implement rehabilitation to such a standard that the rehabilitated land surrounding the excavation can revert to grazing. Θ Use the excavated areas for the final depositing of overburden. Θ Return rocks and coarse material removed from the excavation into the excavation. Θ Remove coarse natural material used for the construction of ramps and dump it into the excavation. Θ Remove stockpiles during the decommissioning phase, rip the area and return the topsoil to its original depth to provide a growth medium.	Applicable throughout operational-, and decommissioning phases. Θ Daily compliance monitoring by site management and ECO. Θ Annual compliance monitoring by independent EAP.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			Θ Do not permit any waste to be deposited into the excavation. Θ Return the previously stored topsoil to its original depth, once overburden, rocks and coarse natural materials have been added to the excavation and it was profiled with acceptable contours and erosion control measures. Θ Seed the site with a local or adapted indigenous seed mix to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within six months from closure of the site. Θ If required by the Regional Manager (DMPR) the soil must be analysed and any deleterious effects on the soil arising from the mining operation must be corrected and the area be seeded with a vegetation seed mix to his/her specification. Θ Measure rehabilitation success by: ▪ At least 70% vegetation cover with indigenous grass species within 12 months of seeding. ▪ Stabilization of slopes to a gradient of 1:3 to prevent erosion. ▪ Regular monitoring for invasive species, with removal interventions implemented quarterly. Θ Block the entrances to the quarry pit to prevent unauthorised access to humans and domestic animals.	

(APPENDIX 4 SECTION 1(1)(l))

N. FREQUENCY OF SUBMISSION OF THE PERFORMANCE ASSESSMENT / ENVIRONMENTAL AUDIT REPORT

The Environmental Performance Assessment / -Audit Report in accordance with Appendix 7 as prescribed in Section 34 of the EIA Regulations, 2014 (as amended) must annually be submitted to the DMPR for compliance monitoring purposes or in accordance with the period stipulated by the department.

(APPENDIX 4 SECTION 1(1)(m))

O. ENVIRONMENTAL AWARENESS PLAN

Once the 2025 EMPR is approved by the DMPR a copy of the approved document will be handed to the site manager to familiarise himself with the document. Matters such as activity boundaries, waste management, dust and vegetation principals will be discussed. The operations manager must ensure that he understands the EMPR document and its requirements and commitments before any activities take place. The Environmental Control Officer must daily check compliance of the activities with the management programmes described in the EMPR.

An initial environmental induction meeting must be held with all the site employees to inform them of the Basic Rules of Conduct regarding the environment, and proof of attendance must be filed for auditing purposes. Each new employee (including those of sub-contractors) must attend the environmental induction meeting prior to commencement of his/her responsibilities. Subsequently, all employees must attend an annual environmental training refresher.

The environmental awareness plan must be a living document that is regularly reviewed and updated as relevant environmental concerns arise. The following list represents the basic steps towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks.

Θ **Site Management**

- Stay within boundaries of site – do not enter adjacent properties.
- Keep tools and material properly stored.
- Smoke only in designated areas.
- Use toilets provided – report full or leaking toilets.

Θ **Water Management and Erosion**

- Check that rainwater flows around work areas and are not contaminated.
- Report any erosion.

- Check that dirty water is kept from clean water.
- Do not swim in or drink from quarry pit / excavation.

Θ **Waste Management**

- Take care of your own waste
- Keep waste separate into labelled containers – report full bins.
- Place waste in containers and always close lid.
- Don't burn waste.
- Pick-up any litter laying around.

Θ **Hazardous Waste Management (Petrol, Oil, Diesel, Grease)**

- Never mix general waste with hazardous waste.
- Use only sealed, non-leaking containers.
- Keep all containers closed and store only in approved areas.
- Always put drip trays under vehicles and machinery.
- Empty drip trays after rain.
- Stop leaks and spills, if safe:
  - ✓ Keep spilled liquids moving away.
  - ✓ Immediately report the spill to the site manager/supervision.
  - ✓ Locate spill kit/supplies and use to clean-up, if safe.
  - ✓ Place spill clean-up wastes in proper containers.
  - ✓ Label containers and move to approved storage area.

Θ **Discoveries**

- Stop work immediately.
- Notify site manager/supervisor.
- Includes – archaeological finds, cultural artefacts, contaminated water, pipes, containers, tanks and drums, any buried structures.

Θ **Air Quality**

- Wear protection when working in very dusty areas.
- Implement dust control measures:
  - ✓ Water all roads and work areas.
  - ✓ Minimize handling of material.
  - ✓ Obey speed limit and cover trucks.

Θ **Driving and Noise**

- Use only approved access road.
- Respect speed limits.
- Only use turn-around areas – no crisscrossing through undisturbed areas.
- Avoid unnecessary loud noises.
- Report or repair noisy vehicles.

Θ **Vegetation and Animal life**

- Do not remove any plants or trees without approval of the site manager.
- Do not collect firewood.
- Do not catch, kill, harm, sell or play with any animal, reptile, bird or amphibian on site.
- Report any animal trapped in the work area.
- Do not set snares or raid nests for eggs or young.

Θ **Fire Management**

- Do not light any fires on site, unless contained in a drum at demarcated area.
- Put cigarette butts in a rubbish bin.
- Do not smoke near gas, paints, or petrol.
- Know the position of firefighting equipment.
- Report all fires.
- Don't burn waste or vegetation.

(APPENDIX 4 SECTION 1(1)(n))

P. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

The Financial Provision Regulations, 2015 read with the National Environmental Management Act, 1998 (Act No 107 of 1998) stipulates that a mining right holder must determine and make financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of mining as contemplated in the Act and to the satisfaction of the Minister responsible for mineral resources.

Therefore, apart from the information required in terms of Appendix 4 of the EIA Regulations, 2014 (as amended), this EMPR includes information regarding the financial provision of the mine as well as the most recent Closure Plan (see Appendix D).

Aside from the above, no other specific information was requested by the DMPR that had to be incorporated into this document.

d) FINANCIAL PROVISION

The most recent reassessment of the financial provision of the Quarry was for the year 2025 and is attached to this document as Appendix F (Note: non-public document). The MR Holder must annually review and update the financial provision, upon which it must be submitted to DMPR for review and approved as being sufficient to cover the environmental liability at the time and for closure of the mine at that time.

Q. ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE.

The assumptions made in this document which relate to the assessment of the mining environment and mitigation measures proposed, stem from site specific information gathered from site inspections, desktop studies, and background information that were gathered by the EAP. No uncertainty regarding the project or the receiving environment could at this stage be identified.

R. UNDERTAKING BY EAP

The EAP herewith confirms

a) the correctness of the information provided in the reports;
b) the inclusion of comments and inputs from stakeholders and I&AP's;
c) that the information provided by the EAP to interested and affected parties and any response by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein;

Christine Fouché

Signature of the environmental assessment practitioner:

Greenmined Environmental (Pty) Ltd

Name of Company:

13 November 2025

Date:

S. UNDERTAKING BY MINING RIGHT HOLDER

I Edmund William Foster the undersigned and duly authorised thereto by.....*Aliwal Dolerite Quarry (Pty) Ltd*.....hereby undertake to implement all the aspects contained in the EMPR and accept full responsibility therefore.

SIGNED at Aliwal Dolerite this 14 day of November 2025

SIGNATURE

WITNESSES:

1.....

2.....

Official use

APPROVAL

Approved in terms of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998), as amended.

SIGNED at ..... this ..... day ..... 202.....

REGIONAL MANAGER
EASTERN CAPE

Undertaking/eg

-END-

APPENDIX A1

REGULATION 42 MINE PLAN – MINING RIGHT

APPENDIX A2

REGULATION 42 MINE PLAN – SECTION 102 EXTENSION AREA

APPENDIX B

GENERAL SURFACE PLAN

APPENDIX C

ENVIRONMENTAL IMPACT STATEMENT

APPENDIX D

CLOSURE PLAN

APPENDIX E

INVASIVE PLANT SPECIES MANAGEMENT PLAN

APPENDIX F

FINANCIAL PROVISION CALCULATION

APPENDIX G

WATER QUALITY TEST PARAMETERS

APPENDIX H1

COMMENTS AND RESPONSE REPORT

APPENDIX H2

PROOF OF PUBLIC PARTICIPATION

APPENDIX I

CV AND EXPERIENCE RECORD OF EAP