INZALO BLOEMHOF QUARRY

PROPOSED MINING OF AGGREGATE ON THE REMAINING EXTENT OF THE FARM BLOEMHOF 14, MAGISTERIAL DISTRICT PARYS, FREE STATE PROVINCE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

&

ENVIRONMENTAL MANAGEMENT REPORT

JULY 2020

REFERENCE NUMBER: FS 30/5/1/2/2/10045 MR

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mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: *INZALO CRUSHING AND AGGREGATES (PTY) LTD*
TEL NO: *011 966 4313*
FAX NO: *086 513 7220*
POSTAL ADDRESS: *PO. BOX 26730, East Rand, 1462*
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FILE REFERENCE NUMBER SAMRAD: *FS 30/5/1/3/2/1/10045 MR*

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LIST OF ABBREVIATIONS

BID	Background Information Document
DEDET	Department of Environment, Development and Tourism
DEIAR	Draft Environmental Impact Assessment Report
DMR	Department of Mineral and Resources
DMEC	Desired Ecological Management Class
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Awareness Plan
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EIS	Ecological Importance and Sensitivity
EMC	Ecological Management Class
FEIAR	Final Environmental Impact Assessment Report
FEPA	Fresh Water Priority Areas
FS	Free State Province
FSR	Final Scoping Report
GIS	Geographic Information System
GPS	Global Positioning System
GN	Government Notice
GNR	Government Notice Regulation
HIA	Heritage Impact Assessment
Ha	Hectares
HGM	Hydro-geomorphic
I&AP's	Interested and Affected Parties
IWULA/IWMMP	Integrated Water Use Licence Application / Integrated Waste Water Management Plan
LED	Local Economic Development
MPRDA	Minerals and Petroleum Resources Development Act, 2002
MHSA	Mine Health and Safety Act
m	Metres
mm	Millimetres

NEMA	National Environmental Management Act, Act 107 of 1998
NEMBA	National Environmental Management: Biodiversity Act, 2004
NHRA	National Heritage Resources Act
PPE	Personal Protective equipment
PPP	Public Participation Process
Ptn	Portion
PEMC	Present Ecological Management Class
PES	Present Ecological State
SANBI	South African National Biodiversity Institute
SASS	South African Scoring System
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SHE	Safety, Health and Environment
SLP	Social and Labour Plan
SPLUMA	Spatial Planning and Land Use Management Act
REC	Recommended Ecological Category
RHP	River Health Program
WMA	Water Management Area

1. IMPORTANT NOTICE

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

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulation, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

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

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

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process-

(a) determine the policy and legislative context within the activity is located and document how the proposed activity complies with and responds to the policy and legislative context,

(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location,

(c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment,

(d) determine the –

(i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives, and

(ii) degree to which these impacts-

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources, and

(cc) can be avoided, managed or mitigated;

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to manage, avoid or mitigate identified impacts, and

(h) identify residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of The Practitioner: Yolandie Coetzee
Greenmined Environmental
Tel No: 011 966 4390/ 082 734 5113
Fax No: 086 546 0579
e-mail address: Yolandie.c@greenmined.co.za

ii) Expertise of the EAP.

(1) The qualifications of the EAP

(with evidence).

Mrs. Yolandie Coetzee has a B.Sc. Degree in Microbiology and Biochemistry and an Honours Degree in Envivornmental Sciencies. Please find full CV attached in Appendix *1*.

(2) Summary of the EAP's past experience

(In carrying out the Environmental Impact Assessment Procedure)

Yolandie Coetzee is an Environmental Consultant with 9 years' experience in the environmental sector. She specialized the last 5 years in the rehabilitation of mines where she conducted the conceptual rehabilitation and management designs and the closure plans and programs. She has also been involved in a number of other environmental projects including railway sidings, filling stations, abattoir's, logistics hub and mining sites where she compiled environmental management plans, environmental impact assessments, environmental audits, due diligences, IWULA's / IWWMP's and alien invasive encroachment programs.

She studied at the University of Potchefstroom where she has successfully completed her undergraduate degree in microbiology and biochemistry and her Honours degree in environmental sciences. See a list of past project attached as Appendix 1.

b) Description of the property

Farm Name:	Remaining extent of the farm Bloemhof 14, Parys, Free State Province.
Application area (Ha)	25.4 ha
Magisterial district:	Parys
Distance and direction from the nearest town	Situated approximately 75 km North of Kroonstad Free State Province
21 digit Surveyor General Code for each farm portion	F02500000000001400000

c) Locality map

(show nearest town, scale not smaller than 1:250000)

The requested map is attached as Appendix 5. The project site falls within the quarter degree square 2727 BA.

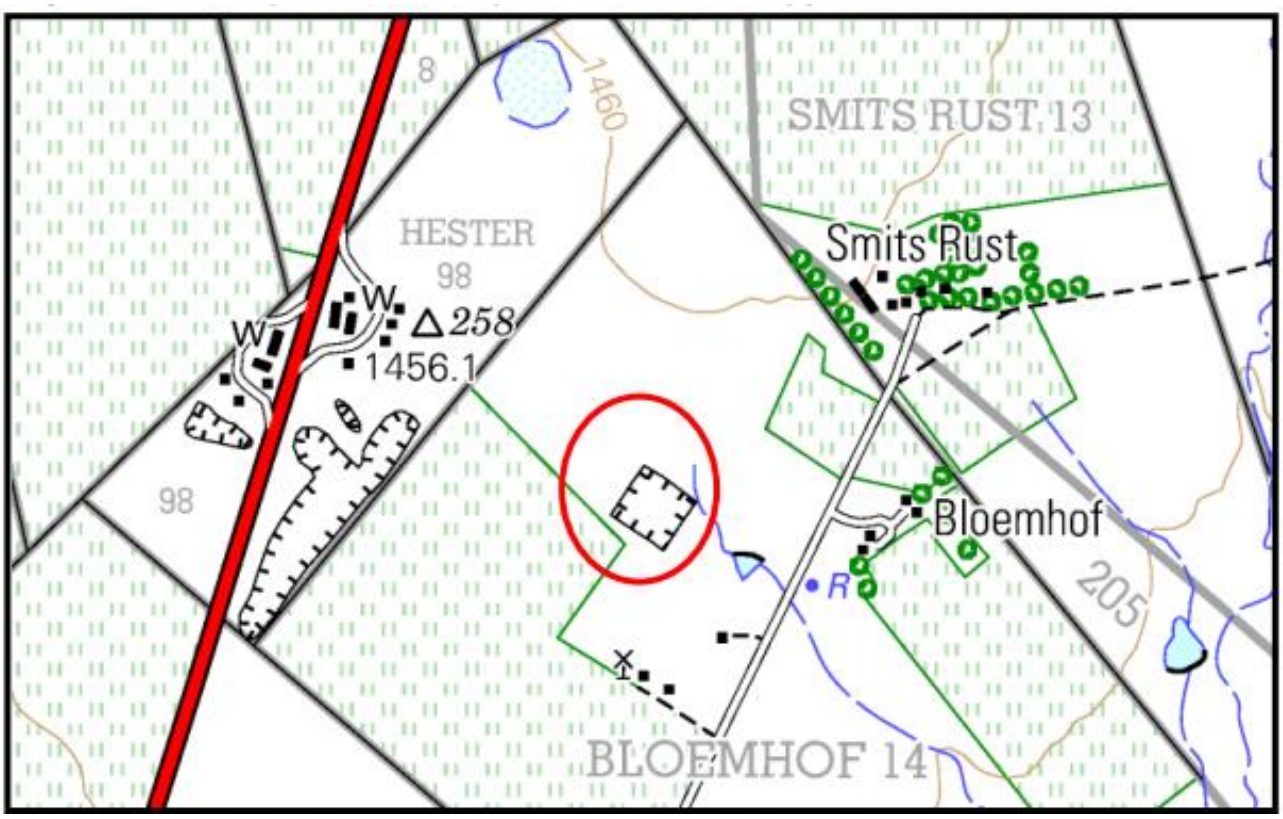


Figure 1: Topographical map of the project site (Preez, July 2018)

d) Description of the scope of the proposed overall activity.

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1:10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site

Inzalo Crushing and Aggregates (Pty) Ltd intends to apply for a Mining Right to mine 25.4 ha of the remaining extent of the farm Bloemhof 14, which falls in the Parys Administrative District, Free State Province.

The area earmarked for the proposed mining falls on a section of the farm that was previously used as an existing quarry (10001MP) and the intention of this application is to increase the existing quarry. The mining methods will make use of blasting means of explosives in order to loosen the hard rock, the material is then loaded and hauled out of the excavation to the mobile crushing and screening plants. The aggregate will be stockpiles and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site. B&E International (Pty) Ltd obtained a mining permit for the existing quarry area in 2012 with permit no 07/2012 and Mining Permit Reference Number FS 30/5/1/3/2/10001MP on the 13th of August 2012. The permit has been renewed for its 3rd renewal period on 10th November 2017 which expired on the 9th of November 2018. B&E International only commenced with the mining activities in August 2018, and therefore Inzalo Crushing and Aggregates

applied for a Mining Right on 15 May 2018 in order for the Mining Right to be approved by the time that the mining permit (10001MP) expires and B&E International (the contractor for Inzalo Crushing and Aggregates) can continue with the quarrying process. The 300 days ended on the 21st of April 2019. The mining infrastructure that will be used under the Mining Permit, will be the same infrastructure to be used during the mining right. Therefore, the mining equipment currently located on site, is to remain until the right has been granted. The decision in the infrastructure to remain until the mining right was made due to the fact that it is a costly process to remove the infrastructure from site, for such a short period. Therefore, Inzalo Crushing and Aggregates and B&E International has made the decision to keep the infrastructure on site as is should the right not get approved, the site will have to be fully rehabilitated by the contractor.

The proposed mining area is approximately 25.4 ha is extent and the applicant, Inzalo Crushing and Aggregates (Pty) Ltd, intents to win material from the area for at least 20 years. The aggregate / stone gravel to be removed from the quarry will be used for road construction in the vicinity.
The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure in and around the Koppies / Parys area.

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Blasting;
- Excavating;
- Crushing;
- Stockpiling and transporting;
- Sloping and landscaping upon closure of the site; and
- Replacing the topsoil and vegetation the disturbed area.

The mining site will contain the following:

- Drilling equipment;
- Excavating equipment;
- Earth moving equipment; and
- Mobile crushing and screening plants.

A generator will be used to power the infrastructure on site until an Eskom connection can be secured. Water from the existing pit will be pumped out of the quarry and reused for mineral processing and dust suppression. Authorisation for this use was received on the 12th of August 2019 in terms of a general authorisation as published in schedule to notice 665 in the Government Gazette of 6

September 2013. Potable water will be transported to site for daily use. The solid waste produced during the operational phase of the project will be transported from site the Koppies landfill site. Approximately thirty-six (36) workers will be employed at the site See the requested map attached as Appendix 6.

There is an Eskom servitude (Parys Rural TVL 11kV) located approximately 350m south-east of the proposed mining area. This servitude area will not be impacted by the mining right activities on site

i) Listed and specified activities

NAME OF ACTIVITY **(E.g. For prospecting –** drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc **E.g. for mining –** excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity Ha or m^2**	**LISTED ACTIVITY Mark with an X where applicable or affected**	**APPLICABLE LISTING NOTICE (GNR 324, GNR 325, GNR 326 OR GNR 327)**
Demarcation of site with visible beacons	25.4 ha	N/A	Not listed
Establishment Of Temporary Buildings And Infrastructure Within Boundaries Of Site.	120 000 m^2	N/A	Not listed
Strip and Stockpile of topsoil	25.4 ha	X	GNR 325 Environmental Impact Assessment Regulations Listing Notice 2 of 2014 Activity 17 (Mining Right area): *Any activity including the operation of that activity which requires a mining right in terms of section 22 of the Mineral and Petroleum Resources Development Act, 2002 (act No. 28 of 2002), including associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource or the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.*

NAME OF ACTIVITY **(E.g. For prospecting –** drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc **E.g. for mining –** excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected**	**APPLICABLE LISTING NOTICE (GNR 324, GNR 325, GNR 326 OR GNR 327)**
			GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22: *The decommissioning of any activity requiring –* *(i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or* *(ii) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure;* *but excluding the decommissioning of an activity relating to the secondary processing of a –* *(a) mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource; or* *(b) petroleum resource, including the refining of gas, beneficiation, oil or petroleum products; –* *in which case activity 31 in this Notice applies.*

NAME OF ACTIVITY **(E.g. For prospecting –** drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc **E.g. for mining –** excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected**	**APPLICABLE LISTING NOTICE (GNR 324, GNR 325, GNR 326 OR GNR 327)**
			<u>GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 27 (Mining Area):</u> *The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.* <u>GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 28 (Mining and Stockpile area):</u> *Commercial and industrial developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.* <u>GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 35 (Mining and Stockpile area):</u> *The expansion of residential, retail, recreational, tourism, commercial or institutional developments on land previously used*

NAME OF ACTIVITY **(E.g. For prospecting –** drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc **E.g. for mining –** excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected**	**APPLICABLE LISTING NOTICE (GNR 324, GNR 325, GNR 326 OR GNR 327)**
			for mining or heavy industrial purposes, where the increased development footprint will exceed 1 000 square meters; excluding— *(i) where such land has been remediated in terms of part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or* *(ii) where an environmental authorisation has been obtained for the decommissioning of such a mine or industry in terms of this Notice or any previous NEMA notice; or* *(iii) where a closure certificate has been issued in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) for such land.*
Drilling and Blasting	10 ha / 100 000 m²	X	• GNR 325 Environmental Impact Assessment Regulations Listing Notice 2 of 2014 Activity 17 (Mining Right area); and • GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22; Activity 27 (Mining Area): Activity 28 (Mining and Stockpile area); Activity 35 (Mining and Stockpile area).

NAME OF ACTIVITY **(E.g. For prospecting –** drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc **E.g. for mining –** excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected**	**APPLICABLE LISTING NOTICE (GNR 324, GNR 325, GNR 326 OR GNR 327)**
Excavation And Loading Of Aggregates To Be Processed	10 ha / 100 000 m²	X	• GNR 325 Environmental Impact Assessment Regulations Listing Notice 2 of 2014 Activity 17 (Mining Right area); and • GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22; Activity 27 (Mining Area): Activity 28 (Mining and Stockpile area); Activity 35 (Mining and Stockpile area).
Crushing and screening of aggregates	1 ha	X	• GNR 325 Environmental Impact Assessment Regulations Listing Notice 2 of 2014 Activity 17 (Mining Right area); and • GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22; Activity 27 (Mining Area): Activity 28 (Mining and Stockpile area); Activity 35 (Mining and Stockpile area).
Stockpiling and transportation of material from stockpile area to clients	6.8 ha / 60 000 m²	X	• GNR 325 Environmental Impact Assessment Regulations Listing Notice 2 of 2014 Activity 17 (Mining Right area); and • GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22; Activity 27 (Mining Area): Activity 28 (Mining and Stockpile area); Activity 35 (Mining and Stockpile area).

NAME OF ACTIVITY **(E.g. For prospecting –** drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc **E.g. for mining –** excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity Ha or m²**	**LISTED ACTIVITY Mark with an X where applicable or affected**	**APPLICABLE LISTING NOTICE (GNR 324, GNR 325, GNR 326 OR GNR 327)**
Sloping, Landscaping and replacement of topsoil over disturbed area (Final Rehabilitation)	25.4 ha		• GNR 325 Environmental Impact Assessment Regulations Listing Notice 2 of 2014 Activity 17 (Mining Right area); and • GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22; Activity 27 (Mining Area): Activity 28 (Mining and Stockpile area); Activity 35 (Mining and Stockpile area).

ii) Description of the activities to by undertaken

(Describe Methodology or technology to be employed, including the type of commodity to be mined and for a linear activity, a description of the route of the activity)

B&E International (Pty) Ltd obtained a mining permit for the existing quarry area in 2012 with permit no 07/2012 and Mining Permit Reference Number FS 30/5/1/3/2/10001MP on the 13th of August 2012. The permit has been renewed for its 3rd renewal period on 10th November 2017 which expired on the 9th of November 2018. B&E International only commenced with the mining activities in August 2018, and therefore Inzalo Crushing and Aggregates applied for a Mining Right on 15 May 2018 in order for the Mining Right to be approved by the time that the mining permit (10001MP) expires and B&E International (the contractor for Inzalo Crushing and Aggregates) can continue with the quarrying process. The 300 days ended on the 21st of April 2019. The mining infrastructure that will be used under the Mining Permit, will be the same infrastructure to be used during the mining right. Therefore, the mining equipment currently located on site, is to remain until the right has been granted. The decision in the infrastructure to remain until the mining right was made due to the fact that it is a costly process to remove the infrastructure from site, for such a short period. Therefore, Inzalo Crushing and Aggregates and B&E International has made the decision to keep the infrastructure on site as is should the right not get approved, the site will have to be fully rehabilitated by the contractor.

The proposed mining site will be an extension of the existing quarry pit previously distributed by stone aggregate mining activities. The mining methods will make use of blasting means of explosives in order to loosen the hard rock, the material is then loaded and hauled out of the excavation to the mobile crushing and screening plants. The aggregate will be stockpiles and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site.

The GPS coordinates of the proposed mining area are as follow:

Preferred Alternative	
Decimal Degrees	**Degrees; Minutes: Seconds**
A27.0548894°S; 27.5625444°E	A27°3'17.6018"S; 27°33'45.1598"E
B27.0513029°S; 27.5650583°E	B27°3'4.6904"S; 27°33'54.2099"E
C27.0483198°S; 27.5596529°E	C27°2'53.9513"S; 27°33'34.7504"E
D27.0502365°S; 27.5575594°E	D27°3'0.8514"S; 27°33'27.2138"E
A27.0548894°S; 27.5625444°E	A27°3'17.6018"S; 27°33'45.1598"E

ALTERNATIVE SITE DESCRIPTION

The following alternative site was assessed for the proposed mining but found not environmentally and practically suitable. The site still has a green status and the natural area will need to be disturbed for the quarry to be established.

Site Alternative	
Decimal Degrees	**Degrees; Minutes; Seconds**
A27.05248°S; 27.5601234°E	A27°3'8.928"S; 27°33'36.4442"E
B27.0497502°S; 27.5622447°E	B27°2'59.1007"S; 27°33'44.0809"E
C27.0518223°S; 27.5660146°E	C27°3'6.5603"S; 27°33'57.6526"E
D27.0560016°S; 27.5637109°E	D27°3'21.6058"S; 27°33'49.3592"E
A27.05248°S; 27.5601234°E	A27°3'8.928"S; 27°33'36.4442"E

An application for a Mining Right in terms of Section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [MPRDA] was submitted to the Department of Mineral Resources (DMR).

The proposed project triggers the following listed activities in terms of the National Environmental Management Act 1998 (Act No. 107 of 1998) [NEMA] and the Environmental Impact Assessment (EIA) Regulations (as amended by GNR 326 effective 7 April 2017), and therefore requires an environmental impact assessment and environmental management program to obtain environmental authorisation:

- GNR 325 Environmental Impact Assessment Regulations Listing Notice 2 of 2014 Activity 17 (Mining Right area):

  Any activity including the operation of that activity which requires a mining right in terms of section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource or the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case Activity 6 in this Notice applies.

- GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2014 Activity 22 (Mining Area):

The decommissioning of any activity requiring –

(i) a closure certificate in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or

(ii) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure;

but excluding the decommissioning of an activity relating to the secondary processing of a –

(a) mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource; or

(b) petroleum resource, including the refining of gas, beneficiation, oil or petroleum products; –

in which case Activity 31 in this Notice applies.

- GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2014 Activity 27 (Mining and Stockpile Area):

  The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.

- GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2014 Activity 28 (Mining and Stockpile area):

  Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or before 01 April 1998 and where such development will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.

- GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2014 Activity 35 (Mining and Stockpile area)

  The expansion of residential, retail, recreational, tourism, commercial or institutional developments on land previously used for mining or heavy industrial purposes, where the increased development footprint will exceed 1 000 square meters; excluding—

(i) where such land has been remediated in terms of part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or

(ii) where an environmental authorisation has been obtained for the decommissioning of such a mine or industry in terms of this Notice or any previous NEMA notice; or

(iii) where a closure certificate has been issued in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) for such land.

Other legislation triggered by the proposed project includes:

- An application for a Mining Right in terms of Section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) has been submitted to the Department of Mineral Resource.

B&E International (Pty) Ltd obtained a mining permit for the existing quarry area in 2012 with permit no 07/2012 and Mining Permit Reference Number FS 30/5/1/3/2/10001MP on the 13th of August 2012. The permit has been renewed for its 3rd renewal period on 10th November 2017 which expired on the 9th of November 2018. B&E International only commenced with the mining activities in August 2018, and therefore Inzalo Crushing and Aggregates applied for a Mining Right on 15 May 2018 in order for the Mining Right to be approved by the time that the mining permit (10001MP) expires and B&E International (the contractor for Inzalo Crushing and Aggregates) can continue with the quarrying process. The 300 days ended on the 21st of April 2019. The mining infrastructure that will be used under the Mining Permit, will be the same infrastructure to be used during the mining right. Therefore, the mining equipment currently located on site, is to remain until the right has been granted. The decision in the infrastructure to remain until the mining right was made due to the fact that it is a costly process to remove the infrastructure from site, for such a short period. Therefore, Inzalo Crushing and Aggregates and B&E International has made the decision to keep the infrastructure on site as is should the right not get approved, the site will have to be fully rehabilitated by the contractor.

Site Establishment / Construction phase:

During the site establishment phase the applicant have to fence the footprint area and clear the topsoil from the applied area, it should be noted that there is very little topsoil on site.

Upon stripping, the topsoil will be stockpiled along the boundaries of the mining area to be used during the rehabilitation phase. Topsoil stripping will be restricted to the areas to be used for aggregate stockpiling and mining.

The complete A-horizon (topsoil – the top 100 – 200 mm of soil which is generally darker coloured due to high organic matter content) will be removed. If it is unclear where the topsoil layer ends the top 300 mm of soil has to be stripped. The topsoil will be stockpiled in the form of a berm alongside the boundary of the mining area where it will not be driven over, contaminated, flooded or moved during the operational phase. The topsoil berm will measure a maximum of 1.5 m high and should be planted with indigenous grass species if vegetation does not naturally establish within 6 months of stockpiling to prevent soil erosion and to discourage growth of weeds. The roots of the grass will also improve the viability of the soil for rehabilitation purposes.

The proposed mining area was previously used for aggregate mining and therefore no construction phase is applicable. The area need to be cleared of topsoil and an access road already exist. The expansion of the quarry pit will be handled as part of the operational phase of the quarry. As the infrastructure are temporary the use of infrastructure and machinery that is either track-based or can be removed without difficulty. Temporary infrastructure to be used in the mining method will entail a temporary weighbridge and chemical toilet, with servicing of vehicles and equipment being done on-site at the workshop and wash bay of the applicant. An on-site office will also be used for all administration purposes relating to the project.

During the site establishment phase the applicant, have to demarcate the boundaries of the site and fence the entire mining area.

The applicant will introduce the processing equipment to the area during the site establishment phase. The equipment to be introduced on site will entail the following:

- Drilling Equipment;
- Excavating Equipment;
- Earth Moving Equipment;
- Crushing and Screening infrastructure;
- Site Office (120m^2);
- General Waste Area (25 m^2);
- Hazardous waste storage area (25 m^2);
- Site vehicles;
- Parking area for visitors and site vehicles;
- Vehicle service area (48 m^2);
- Wash bay (24 m^2);

- Workshop (24 m^2);
- Vehicle Service Area (48 m^2)
- Salvage Yard (100 m^2);
- Bunded diesel and oil storage facilities (136 m^2);
- Generator on bunded area;
- Ablution Facilities (2 m^2);
- Weigh Bridge (18 m^2); and
- Stockpiles (6.8 ha).

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Blasting;
- Excavating;
- Crushing;
- Stockpiling and transporting;
- Sloping and landscaping upon closure of the site; and
- Replacing the topsoil and vegetation the disturbed area.

The mining site will contain the following:

- Drilling equipment;
- Excavating equipment;
- Earth moving equipment; and
- Mobile crushing and screening plants.

Operational phase:

During the operational phase Inzalo Crushing and Aggregates (Pty) Ltd makes use of blasting by means of emulsion explosives in order to loosen the hard rock, this material will be crushed and screened to produce aggregate. Blasting occurs approximately twice every month.

Mine area:

- Demarcating the mining area:
- The mining area will be clearly demarcated by means of beacons at its corners, and along its boundaries if there is no visibility between the corner beacons.
- Permanent beacons will be firmly erected and maintained in their correct position throughout the life of the operation.

- The blasted material is loaded with earth moving equipment onto tipper trucks, which carts it to the crushing plant.
- Here it is fed into the crushers by means of a system of conveyor belts. After crushing and screening has taken place in the plant the crushed material is transported to the stockpile area. This activity will be continuous throughout the operation phase.

Mineral Processing:

- The mining methods will make use of blasting by means of explosives in order to loosen the hard rock and the material will then be loaded and hauled out of the excavation and loaded onto a mobile crusher plant in the mining area. The aggregate will then be stockpiled and transported to clients via transporting trucks and trailers. Gravel will be recovered mechanically with drilling equipment, excavating equipment, earth-moving equipment, mobile crushing & screening plants. The aggregate / stone gravel that is recovered will be loaded on tipper trucks from where it will be transport to an area where it will be crushed, screened and stockpiled. Blasting noise will be instantaneous and of short duration. This will only occur once every two to three weeks. The blasted material is primarily crushed in the quarry by the blast. It is then loaded with earth moving equipment into trucks, which carts it to the crushing plant. Here it is fed into the crushers by means of a system of conveyor belts. After the crushing and screening has taken place in the plant the crushed material is transported into stockpile.
- Deliveries are made from the aggregate stockpiles. Delivery is by truck or alternatively it is collected by the client's transport.
- Approximately thirty workers will be employed at the site.

Working hours:

- All proceedings will be undertaken in 24 hours' day shifts to meet schedule demands.
- Two Shifts will be worked:
    - Sunrise to Sunset
    - Sunset to Sunrise

Plant Residue Disposal:

- No plant residue is generated that need to be disposed. Unsuited material will be put back into the excavations.

Roads and Transport:

- The site is located of the N1 at the R723 Heilbron / Vredefort off ramp. Turn right on the R723 and left in the direction of Heilbron. Continue approximately 1.2 km and turn left at the unnamed public road towards the Bloemhof Farm continue 1.7 km to the farm gates.

Haul trucks will travel along the existing farm road up to the unnamed public road. Turning right they will travel along the existing road, as illustrated below.

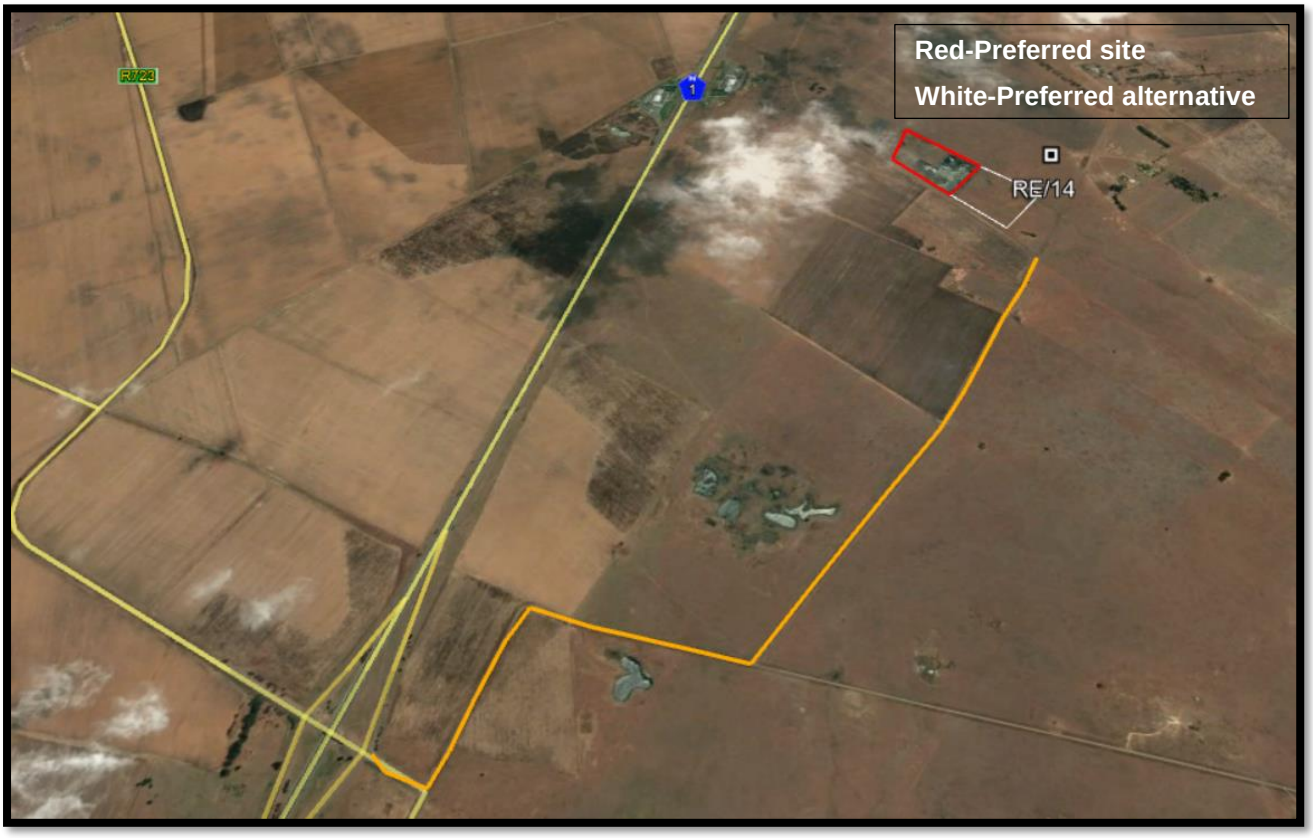


Figure 2: Satellite view indicating the proposed access road to the mining site

- In the event that new roads need to be constructed, these roads will be selected as far as possible to avoid watercourses and steep gradients. Adequate drainage and erosion protection in the form of cut-off berms or trenches will be provided where necessary.
- Any new roads to be established to the site will be below the threshold of the EIA regulations of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended June 2014.

- The existing farm road will be used as access road to the site. Should a portion of the access road need to be newly constructed in future the following will be adhered to:
    - The route will be selected that a minimum number of bushes or trees are felled and existing fence lines will be followed as far as possible.
    - Adequate drainage and erosion protection in the form of cut-off berms or trenches will be provided where necessary.

Water:

- Process water will be obtained from the existing quarry pit. The water will mainly be used for dust suppression purposes on the crusher plant, roads and mining area. The mining activities will require process water that will be sourced from the quarry pit. Authorisation for this use was received on the 12th of August 2019 in terms of a general authorisation as published in schedule to notice 665 in the Government Gazette of 6 September 2013 – see Appendix 19. Potable water will be transported to site daily. The solid waste produced during the operational phase of the project will be transported from site to the nearest landfill site.

Decommissioning phase:

- The existing mining permit area will be enclosed in the mining right area.
- The closure objectives for the mining area is to be made safe, and the remainder of the site to be returned to agricultural use. The perimeter of the site will be subject to 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.
- Control of weeds and alien invasive plant species is an important aspect after topsoil replacement and seeding (if applicable) has been done in an area.
- Site management will implement an alien invasive plant management plan during the 12 months' aftercare period to address germination of problem plants in the area.

The decommissioning activities will consist of the following:

- Landscaping during rehabilitation;
- Replacing of topsoil; and
- Implementation of an alien invader plant management plan.

e) Policy and Legislative Context.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT?** (E.g. In terms of the national water act – water use license has/ has not been applied for)
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) • Section 22	Application for a Mining Right Ref No: FS 30/5/1/2/2/10045 MR	Act No. 28 of 2002 • Section 22
National Environmental Management Act 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2017 • GNR 325 Environmental Impact Assessment Regulations Listing Notice 2 of 2017: Activity 2 • GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017: Activity 22 • GNR 325 Environmental Impact Assessment Regulations Listing Notice 2 of 2017: Activity 27 • GNR 325 Environmental Impact Assessment Regulations Listing Notice 2 of 2014: Activity 28 • GNR 325 Environmental Impact Assessment Regulations Listing Notice 2 of 2014: Activity 35	Application for environmental authorisation Ref No: FS 30/5/1/2/2/10045 MR Section A, 3d (i).	Application for environmental authorisation Ref Nr: FS 30/5/1/2/2/10045 MR • GNR 325: Activity 17 • GNR 325: Activity 22 • GNR 325: Activity 27 • GNR 325: Activity 28 • GNR 325: Activity 35
National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) and amendments.	Assessment of the Biophysical Environment	Assessment of biophysical environment. Weed / alien vegetation clearing.
National Forest Act, Act 84 of 1998	Protected trees could occur on the proposed sites	Assessment of biophysical environment.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT?** (E.g. In terms of the national water act – water use license has/ has not been applied for)
National Environmental Management Act: Waste Act, 2004 (Act No. 59 of 2008) and amendments	Assessment of waste related activities on site	Assessment of waste related activities on site. Waste management on site.
National Environmental Management Act: Air Quality Act, 2004 (Act No. 39 of 2004) and amendments	Assessment of the dust activities on site.	Assessment of the dust activities on site. Dust monitoring and mitigation on site.
National Water Act, 1998 (Act No. 36 of 1998).	Assessment of the water activities and water use activities on site.	Assessment of the water activities and water use activities on site. Water management on site.
Mine Health and Safety Act, 1996 (Act No. 29 of 1996)	The mitigation measures proposed for the site includes specifications of the MHSA.	The mitigation measures proposed for the site includes specifications of the MHSA.
National Heritage Resources Act No. 25 of 1999	Assessment of the Cultural and Heritage Environment	Assessment of the cultural and heritage environment. No aspects of the project could be identified that triggers the NHRA.
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) Land Use Planning Ordinance (Ordinance 15 of 1985)	Assessment of biophysical environment Land use zoning requirements	Land use zoning requirements

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT?** (E.g. In terms of the national water act – water use license has/ has not been applied for)
Free State Nature Conservation Ordinance 8 of 1969	Biophysical Environment on protected species that may occur.	No aspects on site could be identified that needs protection in terms of the Free State Nature Conservation Ordinance.
Ngwathe Local Municipality Spatial Planning and Land Use Management By-law 2015	Part A(iv)(1)(b) Description of the current land uses	
Spatial Planning and Land Use Management Act (SPLUMA)	Land use zoning requirements	Land use zoning requirements
Free State Town Planning and Land Related By-Laws	Part A(iv)(1)(b) Description of the current land uses	Land use zoning requirements
Ngwathe Local Municipality Integrated Development Plan	Part A(iv)(1)(b) Description of the current land uses	Description of the current land uses
Public Participation Guideline in terms of the NEMA EIA Regulations. DEA Public Participation Guidelines of 2012 and 2017 Guideline on Need and Desirability	This document	Used during the public participation process

f) Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

The applicant Inzalo Crushing and Aggregates (Pty) Ltd is well aware of the demand of aggregates for road upgrades and the construction industry in the vicinity of the property triggered the need of the applicant to trade with the available aggregate.

In the light of the above, the applicant, has applied for a mining right to commercially source the available Felsic Rock on the remaining extent of the farm Bloemhof 14, which falls in the Parys Administrative District, Free State Province. The mining of aggregates from the property will also enable the landowner to diversify the income generating activities on the property, extending it from agriculture to include small scale mining.

The aggregate from the mining area will be used for base source in the upgrading of roads in the Koppies area. The activity will therefore have a positive impact on the surrounding environment as it will aid infrastructure development of the area.

g) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site.

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

Inzalo Crushing and Aggregates (Pty) Ltd identified the need for Felsic rock / aggregate in the area due to an increase in building, construction and road maintenance projects. As mentioned earlier, the quarry pit on the property of the applicant has previously been used for mining purposes. The establishment of a quarry pit in a greenfield area while the existing quarry pit has not yet been mined out or rehabilitated were not found to be the best option with regard to sustainable development. In the light of the above the impacts associated with establishing another quarry pit in a greenfield site on the property is believed to have a higher significance without the need or motivation to justify it.

The proposed site earmarked for the mining of the loose aggregate will entail an area previously used for mining.

The proposed site was identified as the preferred alternative due to the following reasons:

- The mining site offers the mineral sought after;
- The mineral to be mined is already in aggregate form and will not need to be blasted in order to loosen the material;
- The proposed sites were previously used for mining activities, thus minimal environmental damage will occur;
- The mining area can be reached by an existing farm access road that connects to R723. No new road infrastructure need to be constructed;
- Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with mining is deemed to be of low significance; and
- No residual waste as a result of the mining activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site (Koppies Municipal Landfill). The amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil will be removed to the depth of the spillage and contained in sealed bins until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site.

The mining procedure will entail the expansion of the existing quarry through opencast mining methods. The applicant will:

- Drill and blast the hard rock after the topsoil of the area has been stripped and stockpiled,
- Load and haul the material out of the excavation to the crushing and screening plants,
- Crush and screen the recovered material at the crusher plant in order to reduce it to various size aggregate,
- Stockpile the aggregate at a stockpile area until it is collected by clients.

A generator will be used to power the infrastructure on site until an Eskom connection can be secured. Water from the existing pit will be pumped out of the quarry and reused for mineral processing and dust suppression. Potable water will be transported to site for daily use. The solid waste produced during the operational phase of the project will be transported from site the Koppies landfill site. Approximately thirty-six (36) workers will be employed at the site See the requested map attached as Appendix 6.

There is an Eskom servitude (Parys Rural TVL 11kV) located approximately 350m south-east of the proposed mining area. This servitude area will not be impacted by the mining right activities on site

Trucks leaving the site will use the existing gravel farm road that connects to the R723 road from where the trucks will deliver material to clients.

The applicant will introduce the processing equipment to the area during the site establishment phase. The equipment to be introduced on site will entail the following:

- Drilling Equipment;
- Excavating Equipment;
- Earth Moving Equipment;
- Crushing and Screening infrastructure;
- Site Office (120m^2);
- General Waste Area (25 m^2);
- Hazardous waste storage area (25 m^2);
- Site vehicles;
- Parking area for visitors and site vehicles;
- Vehicle service area (48 m^2);
- Wash bay (24 m^2);
- Workshop (24 m^2);
- Vehicle Service Area (48 m^2)
- Salvage Yard (100 m^2);
- Bunded diesel and oil storage facilities (136 m^2);
- Generator on bunded area;
- Ablution Facilities (2 m^2);
- Weigh Bridge (18 m^2); and
- Stockpiles (6.8 ha).

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Blasting;
- Excavating;
- Crushing;
- Stockpiling and transporting;
- Sloping and landscaping upon closure of the site; and

- Replacing the topsoil and vegetation the disturbed area.

The mining site will contain the following:

- Drilling equipment;
- Excavating equipment;
- Earth moving equipment; and
- Mobile crushing and screening plants.

i) Details of the development footprint alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Inzalo Crushing and Aggregates (Pty) Ltd identified the need for Felsic rock / aggregate in the area due to an increase in building, construction and road maintenance projects. As mentioned earlier, the quarry pit on the property of the applicant has previously been used for mining purposes. The establishment of a quarry pit in a greenfield area while the existing quarry pit has not yet been mined out or rehabilitated were not found to be the best option with regard to sustainable development.
In the light of the above the impacts associated with establishing another quarry pit in a greenfield site on the property is believed to have a higher significance without the need or motivation to justify it.

The applicant identified two alternative sites for the proposed mining activity namely:

1. **Site Alternative 1 (S1) (Preferred Alternative):** The Applicant, Inzalo intends to apply for a mining right, 25.4 ha, on the remaining extent of farm Bloemhof 14, within the boundaries of the following GPS Coordinates:

Preferred Alternative	
Decimal Degrees	**Degrees; Minutes: Seconds**
A27.0548894°S; 27.5625444°E	A27°3'17.6018"S; 27°33'45.1598"E
B27.0513029°S; 27.5650583°E	B27°3'4.6904"S; 27°33'54.2099"E
C27.0483198°S; 27.5596529°E	C27°2'53.9513"S; 27°33'34.7504"E

Preferred Alternative	
Decimal Degrees	**Degrees; Minutes: Seconds**
D27.0502365°S; 27.5575594°E A27.0548894°S; 27.5625444°E	D27°3'0.8514"S; 27°33'27.2138"E A27°3'17.6018"S; 27°33'45.1598"E

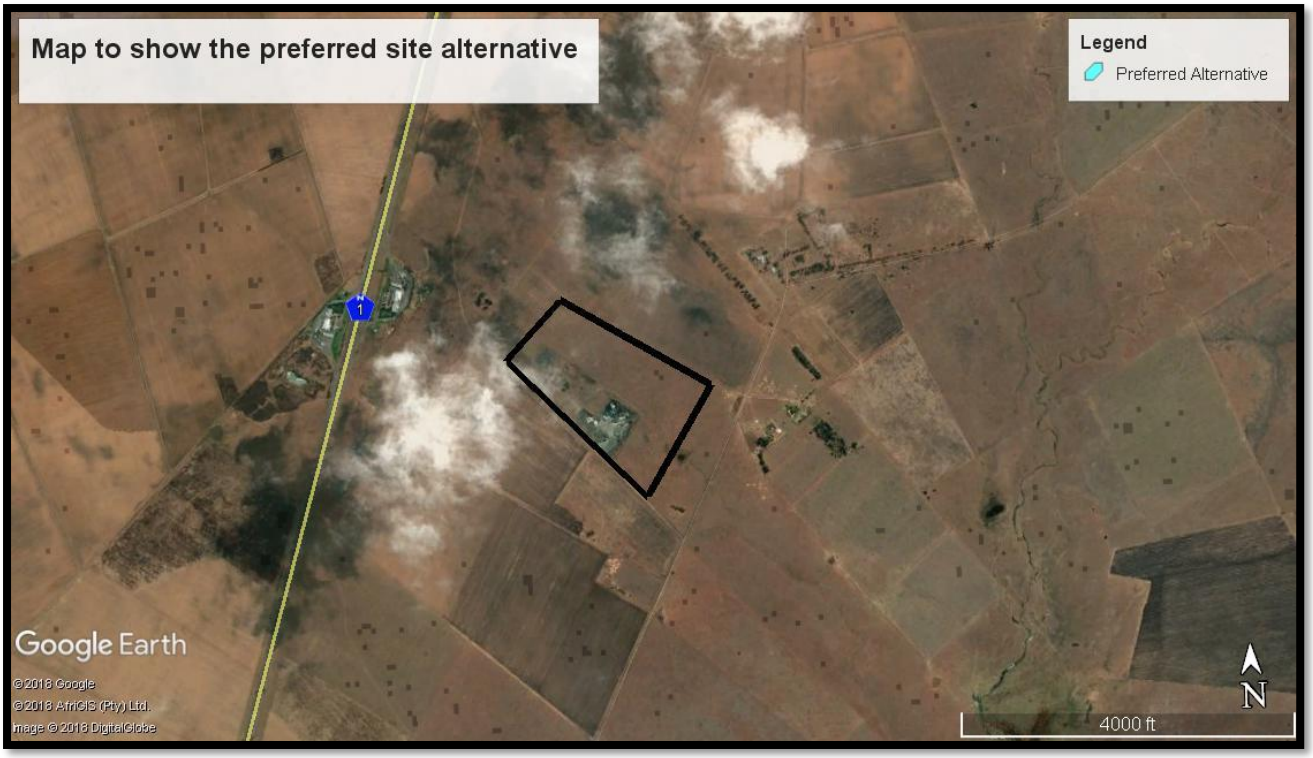


Figure 3: Satellite view showing the position of Site Alternative 1 indicated in blue.

Site Alternative 1 was identified during the assessment phase of the environmental impact assessment, by the applicant and project team, and was therefore selected as the **preferred alternative** due to the following:

- The mining site offers the mineral sought after;
- The proposed footprint area was previously used for mining therefore very little indigenous vegetation needs to be disturbed in order to establish the mining area;
- The site is located approximately 500m from the closest farm house with mitigation measures in place impacts such as dust and noise will be minimal.
- The mining site is more than 25 km away for the town of closest town Koppies, and will not affect the community with regards to dust and noise;
- The mining area can be reached by an existing farm access road that connects to R723. No new road infrastructure need to be constructed;
- Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with mining is deemed to be of low significance; and

- No residual waste as a result of the mining activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site.
- The amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil will be removed to the depth of the spillage and contained in sealed bins until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site.

2. **Site Alternative 2 (S2):** Site Alternative 2 entails the mining of a 25.4 ha area within the boundaries of the following GPS Coordinates:

Site Alternative	
Decimal Degrees	**Degrees; Minutes; Seconds**
A27.05248°S; 27.5601234°E	A27°3'8.928"S; 27°33'36.4442"E
B27.0497502°S; 27.5622447°E	B27°2'59.1007"S; 27°33'44.0809"E
C27.0518223°S; 27.5660146°E	C27°3'6.5603"S; 27°33'57.6526"E
D27.0560016°S; 27.5637109°E	D27°3'21.6058"S; 27°33'49.3592"E
A27.05248°S; 27.5601234°E	A27°3'8.928"S; 27°33'36.4442"E

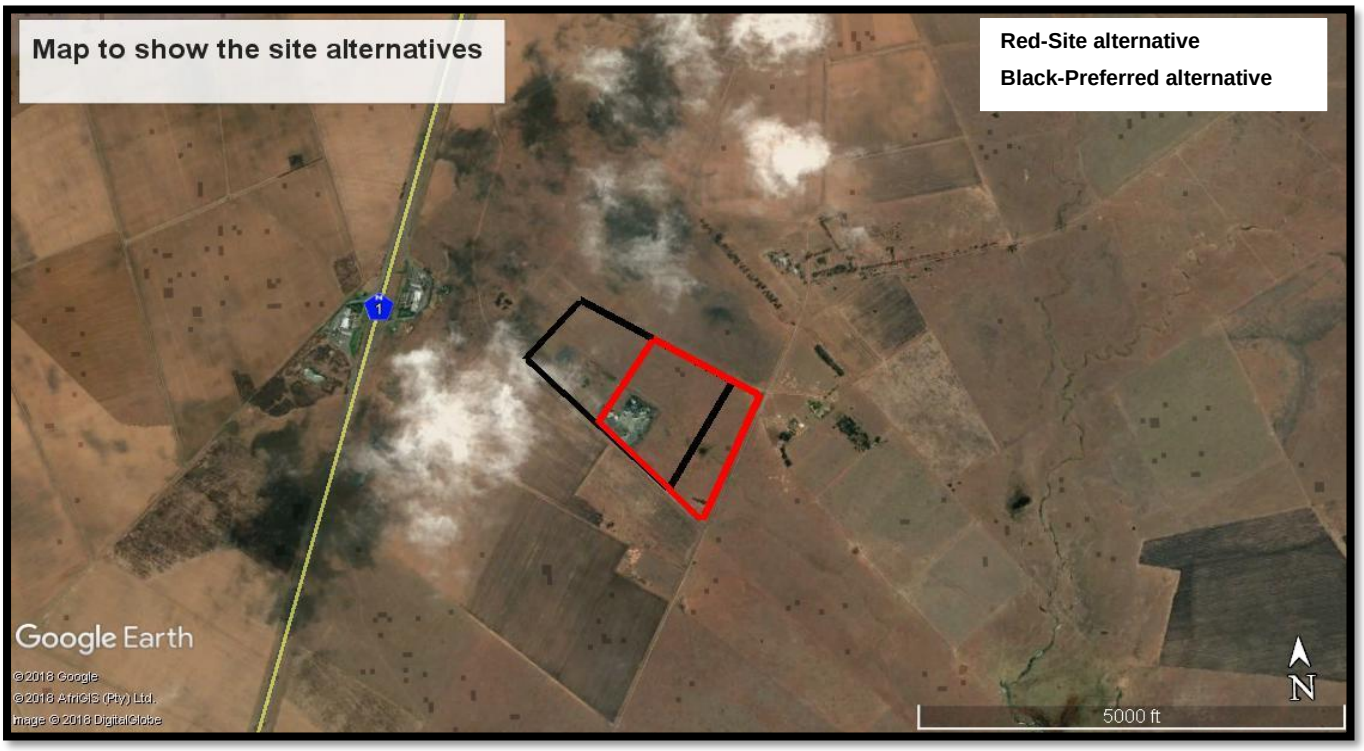


Figure 4: Satellite view showing the position of Site Alternatives

The applicant investigates the possibility of establishing the proposed mining area next to the old mining area, to be located closer to the haul road to cut down on transport cost. This alternative was however found **not** to be the **preferred** alternative due to the following reasons:

- The site alternative will counteract the visual aesthetic value of the area by being closer to the road;
- The site has not been previously disturbed before; thus the natural area needs to be cleared and is not preferred with regards to sustainable development; and
- In the light of the above the impacts associated with establishing another quarry pit in a greenfield site on the property is believed to have a higher significance without the need or motivation to justify it.

Various project alternatives were considered during the planning phase of the project. These included the following:

1. Opencast mining (Preferred Alternative) **vs** Underground Mining:
    - The opencast mining method is used when deposits of commercially useful minerals or rock are found near the surface where the overburden is relatively thin or where the material is structurally unsuitable for tunnelling.
    - Underground Mining is used where the mineral occurs deep below the surface and where the overburden is thick.
    - Opencast mining of the quarry has been identified as the most cost effective method to produce the desired aggregate as the desired rock is found near the surface with a narrow layer of overburden that needs to be removed. The geology of the specific area is also structurally unsuitable for tunnelling.
    - The opencast mining method will not produce any residual waste that has to be disposed of. Due to the remote location of the quarry the potential impacts on the surrounding environment, associated with opencast mining, is deemed to be of low significance. It is proposed that all mining related infrastructure will be contained within the boundary of the mining area.

2. Temporary Infrastructure (Preferred Alternative) **vs** Permanent Infrastructure:
    - The use of temporary infrastructure will entail the use of infrastructure and machinery that is either track-based or can be removed without difficulty. Temporary infrastructure to be used in the mining method will entail a temporary weigh bridge, with servicing of vehicles and equipment being done off-site at the existing workshop

of the applicant. The off-site office will also be used for all administration purposes relating to the project.

- **Positive Aspects:**
  1. The positive aspects associated with the use of temporary infrastructure firstly enable the applicant to move the infrastructure within the boundaries of the mining area as mining of the mineral progresses.
  2. The equipment can move out of the mining area, staying on the existing road, during a blast to prevent potential fly rock damage.
  3. The decommissioning phase is facilitated as the removal of infrastructure from the mining area during the rehabilitation of the site is easy and highly effective.
- The use of permanent infrastructure will entail the construction of an office building with ablution facilities, and installation of a permanent weigh bridge.
- The use of permanent infrastructure will increase the impact of the proposed project on the environment as it will entail the establishment of more structures, necessitate the use of concrete products on site in order to establish these infrastructure, lengthen the period required for rehabilitation as well as increase the rehabilitation amount as the permanent infrastructure will either have to be decommissioned or be maintained after the closure of the site.
- Due to the small size of the mining area the infrastructure may also be exposed to fly rock damage during blasting events.
- The construction of permanent infrastructure at the site will also increase the visual impact of the proposed project on the surrounding environment and additional mitigation measures will have to be implemented to address the impact.
- In the light of the above the use of temporary infrastructure is deemed to be the most viable preferred alternative.

3. No-go Alternative:

The no-go alternative entails no change to the status quo and is therefore a real alternative that needs to be considered. The aggregate to be stockpiled at the site will be used for road and construction industries, if however, the no-go alternative is implemented the applicant will not be able to utilize the mineral present in the area.

This could have major impacts on aspects such as transporting of material to construction sites from far off mining areas, cost effectiveness of material, impact on roads and road users due to long distance hauling of gravel and loss of income to the Koppies / Parys business area due to the multiplier effect.

The no-go alternative was not deemed to be the preferred alternative as:

- The applicant will not be able to supply in the demand of road or construction contractors;
- The application, if approved, would allow the applicant to utilize the available aggregates as well as provide employment opportunities to local employees. Should the no-go alternative be followed these opportunities will be lost to the applicant, potential employees and clients;
- The applicant will not be able to diversify the income of the property; and
- The existing quarry pit on the property could not be rehabilitated as it has been mined years ago and left unrehabilitated.

Please refer to Appendix 2, Appendix 3, Appendix 4, Appendix 5, Appendix 6, and Appendix 7 for the plans of the site.

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attend public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land).

The applicant has submitted a mining right application for environmental authorisation in terms of NEMA, 1998 and the EIA Regulations, 2014 (amended 2017) to the DMR on the 14th of May 2018. Initial public participation was done in terms of this application and the below mentioned stakeholders, the landowner and I&AP's were notified of the proposed project.

The stakeholders and I&AP’s were informed of the project by means of I&AP comment / notification letters that were either delivered by hand or sent directly to the contact persons. A 30 days commenting period were allowed which extended from the 13th of March 2018 to 13th of April 2018 during the initial Mining Right Application. A second commenting period (2nd public participation phase) was allowed which extended from the 13th of April 2018 to May 2018.

A register of interested and affected parties (I&AP's) will be opened and maintained containing the names, contact details and addresses of all persons who have submitted written comments, attended meetings or have in writing requested to be registered and all organs of state which have jurisdiction in respect of the activity. Please note that only registered I&AP's and stakeholders will be entitled to comment on reports and plans to be submitted to the Department provided that the party provides its name, contact details and address and discloses any direct business, financial, personal or other interest which he/she may have in the approval or refusal of the applications.

The DSR was updated to reflect the comments received during the public commenting period. Thereafter, the Final Scoping Report (FSR) was submitted to the Department of Mineral Resources (DMR) – Welkom for review purposes on the 28th of June 2018, for its consideration as part of the authorization process in terms of the NEMA 2014 regulations (as amended by GNR 326 effective 7 April 2017). A copy of the final report will be made available on the Greenmined Environmental website. Once the Final Scoping Report has been accepted (10 July 2018) by the DMR, the Draft Environmental Impact Assessment Report (DEIAR) was prepared and also made available to the public for a 30-day commenting period which ended on the 21st of August 2018. An electronic copy of the report will be published on the Greenmined Environmental website (www.greenmined.com). All registered I&AP's and stakeholders will be notified of the commenting period in advance as above.

The acceptance letter (in terms of MPRDA) for the application was received 18 May 2018. The FSR was accepted by the DMR on the 10th of July 2018.

Upon expiry of the commenting period the DEIAR was updated to reflect the comments received during the public commenting period. Thereafter, the Final EIAR will be submitted to the DMR for its consideration as part of the authorization process in terms of the NEMA 2014 regulations (as amended by GNR 326 effective 7 April 2017). A copy of the final report will be made available on the Greenmined Environmental website. All registered I&AP's and stakeholders will be notified in writing within 14 days of the date of the decision of the outcome of the application, including the reasons for the decision and the right of appeal.

This report is the Final Environmental Impact Assessment Report (FEIAR) for the Mining Right Application.

iii) The following I&AP's and stakeholders were contacted to obtain their comments:

TITLE, NAME AND SURNAME	AFFILIATION/KEY STAKEHOLDER STATUS	CONTACTED DATE	RESPONSE RECEIVED
Mnr. JP Coetzee	Land Owner	2 March 2018	No Comments Received
Boden Family Trust	Surrounding Land Owner	2 March 2018	No Comments Received
Ms Gasela P/A Mr Thamela	Department of Economic Small Business Development, Tourism and Environmental Affairs (DETEA)	2 March 2018	No Comments Received
Mr Mwseoke P/A Ms Kekeletso	Department of Public Works and Infrastructure	2 March 2018	No Comments Received
Mr Mbana Peter Thabethe P/A Ms Mamphona	Department of Agriculture and Rural Development	2 March 2018	No Comments Received
Mr Nomfundo Douwjack Janine Janse v Rensburg	Department of Labour	2 March 2018	No Comments Received
Mr S Msibi P/A Timbe	Department of Police, Roads and Transport	2 March 2018	No Comments Received
Mr TP Ntili	Department of Water Affairs & Sanitation	2 March 2018	No Comments Received
Mr Pule Tshekedi (Acting)	Ngwathe Local Municipality	2 March 2018	No Comments Received
Cllr Rosie Kgantsie.	Ngwathe Local Municipality Ward 8	2 March 2018	No Comments Received
MS LM Molibeli	Fezile Dabi District Municipality	2 March 2018	No Comments Received
Officer Environmental Management Earl Craig Daniels	Eskom	2 March 2018	No Comments Received
Rene de Bruin Land Development Technologist FSOU	Eskom	2 March 2018	3 May 2018
Me Judy Marx	SANRAL Regional Offices	2 March 2018	No Comments Received
Mrs. Ragna Redelstorff Heritage Officer Archaeology, Palaeontology & Meteorites Unit	SAHRA	2 March 2018	26 March 2018 5 July 2018 13 September 2018

On-site notices were placed at the site entrance on the unnamed public road and in town at the Engen Garage in Kroonvaal on the 13th of March 2018. The project was also advertised in the Parys Gazette on the Thursday the 15th of March 2018. An I&AP site meeting (27 March 2018) was held on site to discuss any concerns that the Public or Interested and Affected parties might have with the project.

See attached Appendix 10 for proof of the public participation process conducted for the said mining right application.

iv) Summary of issues raised by I&AP's

(Complete the table summarizing comments and issues raised, and reaction to those responses)

Interested and Affected Parties **List the name of persons consulted in this column, and** **Mark with an X where those who must be consulted were in fact consulted**	**Date Comments Received**		**Issues raised**	**EAP's response to issues as mandated by the applicant**	**Section and paragraph reference in this report where the issues and or response were incorporated.**
AFFECTED PARTIES					
Landowner/s					
Mr. JP Coetzee	X	No comments received	No objections	N/A	N/A
Lawful occupier/s of the land					
N/A		N/A	N/A	N/A	N/A
Landowners or lawful occupiers on adjacent properties					
Boden Family Trust	X	No comments received	N/A	N/A	N/A
Municipal councillor					
Cllr Rosie Kgantsie. Ngwathe Local Municipality Ward 8	X	No comments received	N/A	N/A	N/A
Municipality					

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received		Issues raised	EAP's response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Ngwathe Local Municipality Mr Pule Tshekedi (Acting)	X	No comments received	N/A	N/A	N/A
Fezile Dabi District Municipality MS LM Molibeli	X	No comments received	N/A	N/A	N/A
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWS					
Department of Public Works and Infrastructure – Head of Department Mr Mwseoke P/A Ms Kekeletso	X	No comments received	N/A	N/A	N/A
Department of Police, Roads and Transport Hannes Maree, Assistant Director: Land Acquisition	X	No comments received	N/A	N/A	N/A
Communities					
N/A		N/A	N/A	N/A	N/A
Dept. Land Affairs					

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received		Issues raised	EAP's response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Department of Agriculture and Rural Development Mr Mbana Peter Thabethe P/A Ms Mamphona	X	No comments received	N/A	N/A	N/A
Traditional Leaders					
N/A		N/A	N/A	N/A	N/A
Dept. Environmental Affairs					
Department of Economic Small Business Development, Tourism and Environmental Affairs (DETEA) Ms Gasela P/A Mr Thamela	X	No comments received	N/A	N/A	N/A
Other Competent Authorities affected					

Interested and Affected Parties **List the name of persons consulted in this column, and** **Mark with an X where those who must be consulted were in fact consulted**	**Date Comments Received**		**Issues raised**	**EAP's response to issues as mandated by the applicant**	**Section and paragraph reference in this report where the issues and or response were incorporated.**
Department of Labour Mr Nomfundo Douwjack Janine Janse v Rensburg	X	No comments received	N/A	N/A	N/A
Department of Water and Sanitation Free State Mr TP Ntili	X	No comments received	N/A	N/A	N/A
Department of Police, Roads and Transport - Mr S Msibi P/A Timbe	X	No comments received	N/A	N/A	N/A
ESKOM Officer Environmental Management Earl Craig Daniels	X	No comments received	N/A	N/A	N/A
ESKOM Rene de Bruin Land Development Technologist FSOU	X	3 May 2018	As per the attached sketch, Eskom's network is affected, however Distribution (Dx) will raise no objection to the proposed works, as long as you adhere to Eskom's conditions and treat the power lines as live at all times. The lines affected are:	Inzalo Bloemhof will not be entering the 11m restriction line. Eskom will be notified in any works is to be conducted in the Eskom servitude area.	Section 2: • d); and • h) iii.

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received		Issues raised	EAP's response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			• 2 X Parys Rural - TVL 11kV Please find Eskom's conditions which must always be respected when working near or closer to our services: 1. Eskom Dx shall at all times retain unobstructed access to and egress from its servitudes. 2. Eskom Dx's consent does not relieve the applicant from obtaining the necessary statutory, land owner or municipal approvals. 3. The applicant will adhere to all relevant environmental legislation. Any cost incurred by Eskom Dx as a result of non-compliance will be charged to the applicant. 4. No drilling shall take place within 11 metres from any Eskom Dx power line structure, 5. All work within Eskom Dx's servitude areas shall comply with the relevant Eskom earthing standards in force at the time. 6. If Eskom Dx has to incur any expenditure in order to comply with statutory clearances or other regulations as a result of the applicant's activities or because of the presence of his equipment or	The blasting contractor's drilling en blasting operating procedure, this indicates the method used by the company to excite this operation safely as per legislative. The blasting contractor's explosive control procedure, this indicates the method used by the company to excite this operation safely as per legislative. All nearby businesses, communities or any effected party will be notified of blasting times and regulations put in place by the company responsible for the blasting operations. This will be done by means of signs and delivered printed procedure to all communities. The blasting contractor will assist with evacuating communities which need assistance The blasting contractor will record ensure a legislative legal risk assessment is conducted.	

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received		Issues raised	EAP's response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			installation within the servitude area, the applicant shall pay such costs to Eskom Dx on demand. 7. The use of explosives of any type within 500 metres of Eskom Dx's services shall only occur with Eskom Dx's prior written permission. If such permission is granted the applicant must give at least fourteen working days' prior notice of the commencement of blasting. This allows time for arrangements to be made for supervision and/or precautionary instructions to be issued in terms of the blasting process. If blasting becomes necessary, application in this regard should be made separately. 8. Changes in ground level may not infringe statutory ground to conductor clearances or statutory visibility clearances. After any changes in ground level, the surface shall be rehabilitated and stabilised so as to prevent erosion. The measures taken shall be to Eskom Dx's requirements. 9. Eskom Dx shall not be liable for the death of or injury to any person or for the loss of or damage	Eskom will be notified if any blasting will influence their utilities for example, power line that is within 250m or 500m from the Quarry, a risk assessment and procedure will be given to Eskom and these documents will address how these blasting operations will be done safely.	

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received		Issues raised	EAP's response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			to any property whether as a result of the encroachment or of the use of the servitude area by the applicant, his/her agent, contractors, employees, successors in title, and assigns. The applicant indemnifies Eskom Dx against loss, claims or damages including claims pertaining to consequential damages by third parties and whether as a result of damage to or interruption of or interference with Eskom Dx's services or apparatus or otherwise. Eskom Dx will not be held responsible for damage to the applicant's equipment. 10. No mechanical equipment, including mechanical excavators or high lifting machinery, shall be used in the vicinity of Eskom Dx's apparatus and/or services, without prior written permission having been granted by Eskom. If such permission is granted the applicant must give at least seven working days' prior notice of the commencement of work. This allows time for arrangements to be made for supervision and/or precautionary instructions to be issued by the relevant Technical Service Centre.		

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received		Issues raised	EAP's response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			11. No work shall commence unless Eskom Dx has received the applicant's written acceptance of the conditions specified in the letter of consent and/or permit. 12. Eskom Dx's rights and duties in the servitude shall be accepted as having prior right at all times and shall not be obstructed or interfered with. Note: Where an electrical outage is required, at least fourteen work days are required to arrange same. 13. Under no circumstances shall rubble, earth or other material be dumped within the servitude area. The applicant shall maintain the area concerned to Eskom Dx's satisfaction. The applicant shall be liable to Eskom Dx for the cost of any remedial action which has to be carried out by Eskom Dx. 14. *14.* The clearances between Eskom Dx's live electrical equipment and the proposed construction work shall be observed as stipulated by *Regulation 15* of the *Electrical Machinery Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).*		

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received		Issues raised	EAP's response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			15. Eskom shall be regarded electrically live and therefore dangerous at all times. 16. In spite of the restrictions stipulated by Regulation 15 of the Electrical Machinery Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), as additional safety precaution, Eskom Dx will not approve the erection of houses or structures occupied or frequented by human beings under the power lines or within the servitude area. 17. Eskom Dx may stipulate any additional requirements to illuminate any possible exposure to Customers or Public to coming into contact or be exposed to any dangers to Eskom plant. 18. It is required of the applicant to familiarise him/herself with all safety hazards related to Electrical plant. **19.** Should the applicant or his/her contractor damage any of Eskom's services during execution of any work whatsoever, the incident must be reported to Eskom's Technical service centre, Trompie Terblanche @ 056-819 1062 or 082 8951 041 immediately. The same person		

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received		Issues raised	EAP's response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			must be contacted before commencement of the project as well. For the re-location of any Eskom's services, our customer service centre should be contacted on 051-404 2211. The above conditions should be accepted in writing before any work within Eskom Services commences and the Technical service centre must be informed of the future activities..		
South African Heritage Resource Agency Mrs. Ragna Redelstorff	X	26 March 2018	SAHRA acknowledge BID. The SAHRA Archaeology, Palaeontology and meteorites (APM) will await the Scoping Report before issuing a final comment on the application.		
		5 July 2018	The SAHRA Archaeology, Pathology and meteorites (APM) Unit requires a phase 1 Heritage Impact Assessment to be conducted by a professional heritage practitioner. The heritage practitioner may choose to submit a letter of recommendation for exemption from further heritage studies is the area is heavily described.	Inzalo Bloemhof has appointed a Heritage Impact Practitioner, Jaco van der Walt (HCAC – Heritage Consultants) who conducted the Heritage Impact Assessment. The results were included into this report as part of the Final Environmental Impact Assessment Report.	Part A, 3: • g), v, (1), (a), xii; • h); • j); • K, (i); and • U), i), (2).

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received		Issues raised	EAP's response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
		13 September 2018	The author found no evidence of archaeological sites or artefacts of significance, structures older than 60 years, public monuments or burial sites; however, one stone cairn may, although unlikely, indicate an informal grave. The proposed area is indicated as of insignificant palaeontological sensitivity on the SAHRIS paleontological map. The impact on heritage resources is therefore considered low. The following recommendations are to be implemented as part of the EMPr: • The stone cairn that may indicate a grave is to be preserved in-situ with a 20 meter buffer zone. If this is not possible, it must be proven that it is not a grave in which case no further actions are required. • If any graves are located in future they should ideally be preserved in-situ or alternatively relocated according to existing legislation. • Implementation of a chance find procedure.		Part A, 3: • g), v, (1), (a), xii; • h); • j); • K, (i); and • U), i), (2).
OTHER AFFECTED PARTIES					
N/A			N/A	N/A	N/A

Interested and Affected Parties **List the name of persons consulted in this column, and** **Mark with an X where those who must be consulted were in fact consulted**	**Date Comments Received**	**Issues raised**	**EAP's response to issues as mandated by the applicant**	**Section and paragraph reference in this report where the issues and or response were incorporated.**
INTERESTED PARTIES				
N/A		N/A	N/A	N/A

v) The Environmental attributes associated with the development footprint alternatives.

(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity.

Its current geographical, physical, biological socio-economic, and cultural character).

The key findings of the environmental impact assessment entail the following:

i. Climate

According to SA Explorer, Koppies normally receives about 467 mm of rain per year, with most rainfall occurring mainly during mid-summer. The chart below (lower left) shows the average rainfall values for Koppies per month. It receives the lowest rainfall (0 mm) in July and the highest (85 mm) in January. The monthly distribution of average daily maximum temperatures (centre chart below) shows that the average midday temperatures for Koppies range from 17 °C in June to 28 °C in January. The region is the coldest during June when the mercury drops to 0 °C on average during the night. Consult the chart below (lower right) for an indication of the monthly variation of average minimum daily temperatures.

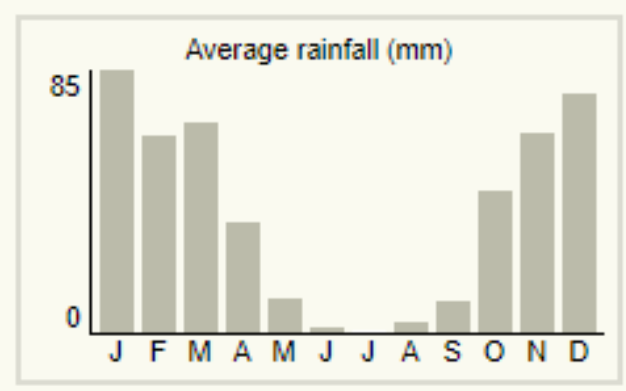


Figure 5: Average rainfall for Koppies

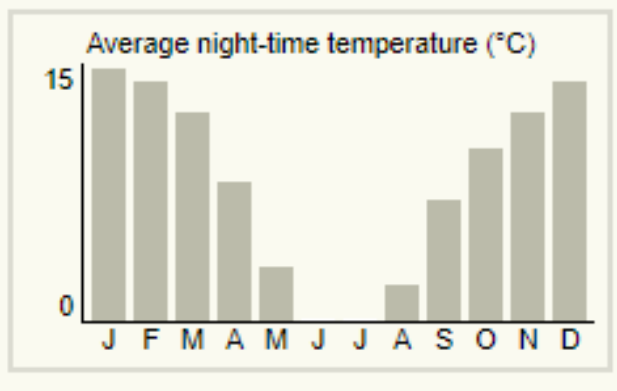


Figure 6: Average night-time temperature

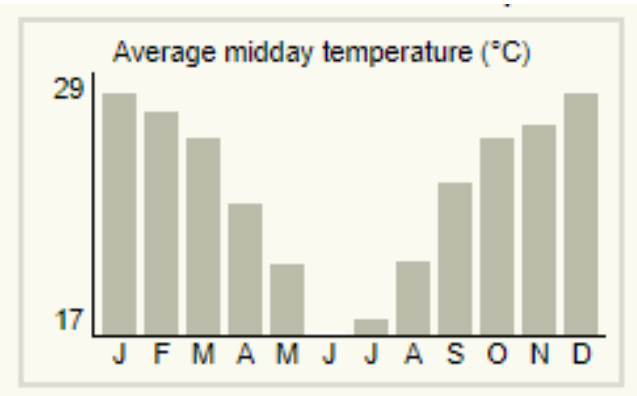


Figure 7: Average midday temperature

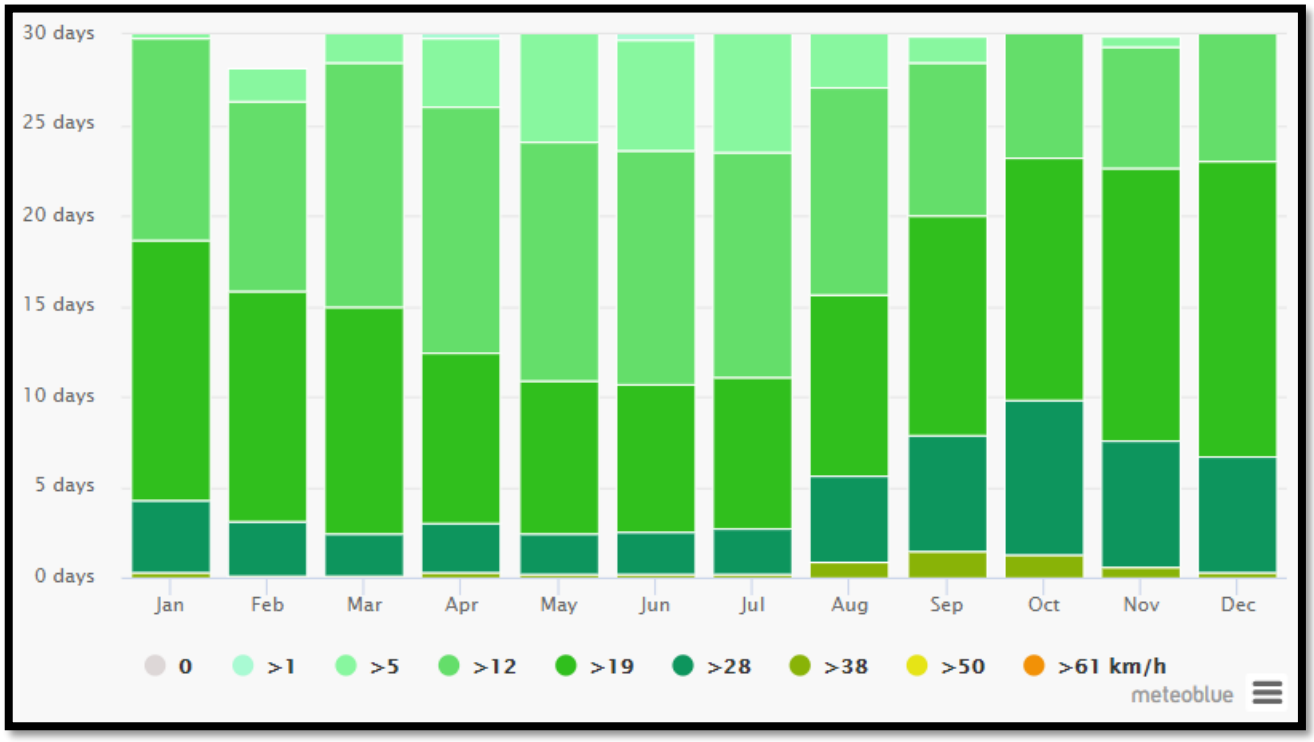


Figure 8: Wind speed in the Koppies area.

The diagram above indicated the days per month during which the wind reached certain speeds. Monsoon creates steady strong winds from December to April, and calm winds during June to October.

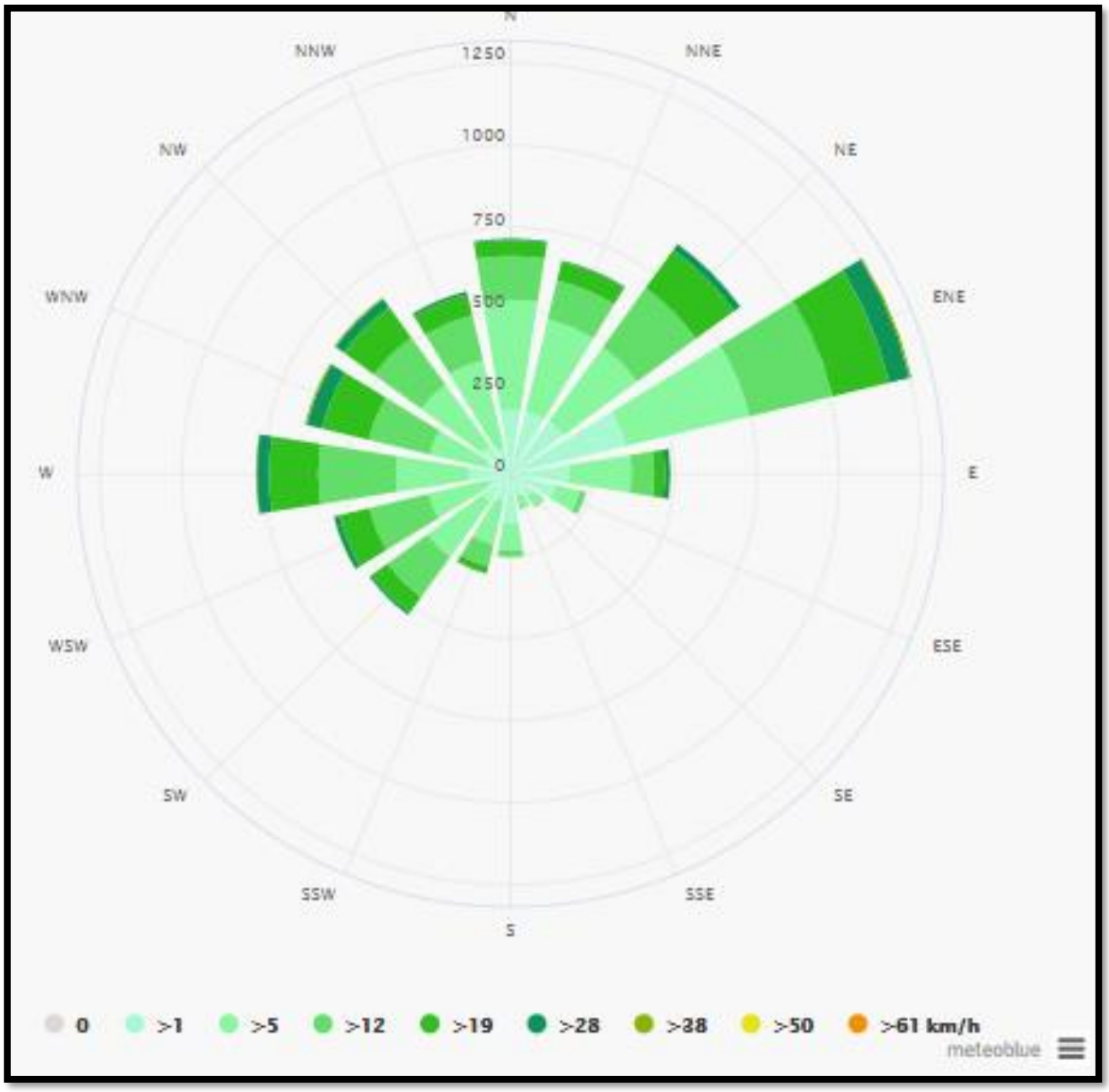


Figure 9: Wind Rose for Koppies.

The wind rose for Koppies indicates how many hours per year the wind blows from the indicated direction. From the figure above the most prevailing wind is from the East-North-Easterly direction.

ii. Geology & Soils

Sedimentary mudstones and sandstone mainly of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup) as well as those of the Ecca Group (Karoo Supergroup) found in the extreme northern section of this grassland, giving rise to vertic, melanic and red soils (typical forms are Arcadia, Bonheim, Kroonstad, Valsrivier and Rensburg)—typical of Dc land type (dominating the landscape). The less common intrusive dolerites of the Jurassic Karoo Dolerite Suite support dry clayey soils typical of the Ea land type.

The geology consists of sedimentary deposits of the Karoo System. Some dolerite intrusions are also present (Preez, July 2018).

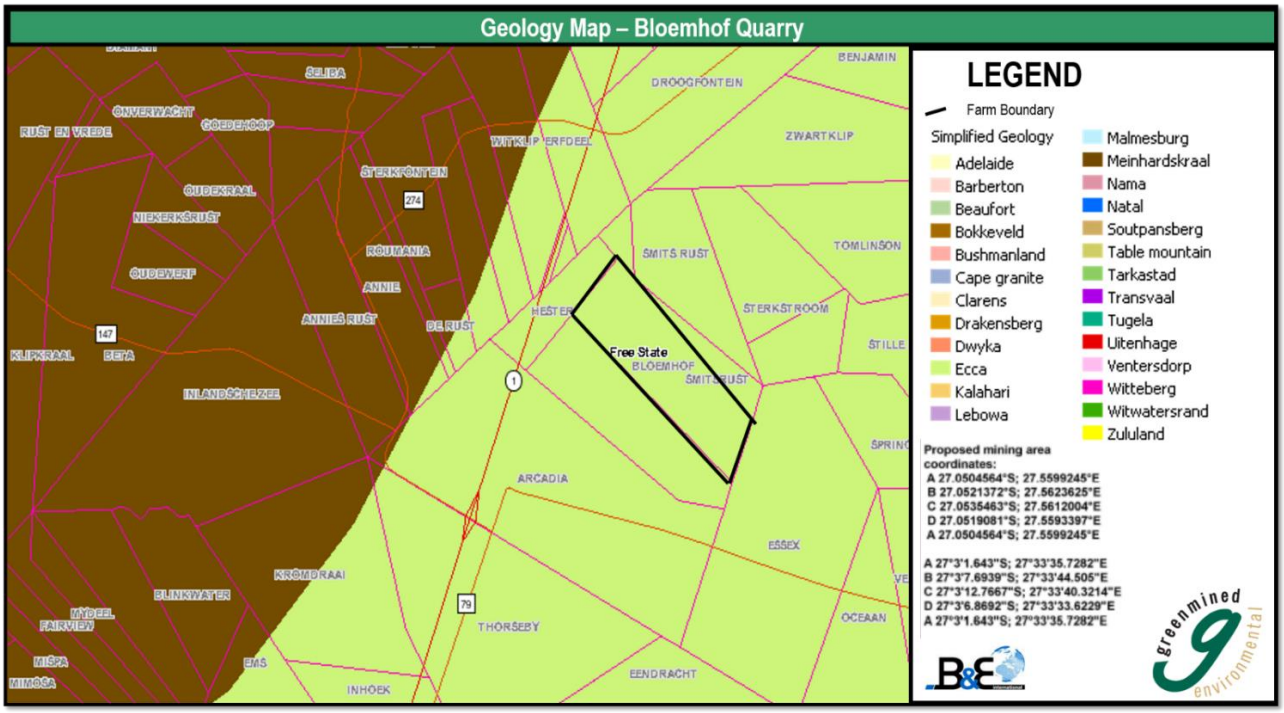


Figure 10: Geology of the Proposed Bloemhof Quarry.

Red to yellow sandy soils of the Ba and B.D land types. The topsoil is between 0 -300mm deep.

The surrounding land uses includes agricultural land and open veldt. Slightly to moderately undulating plains, including some low hills and pan depressions. The soils varies from deep vertic, melanic clay deposits of the Arcadia Form to dystrophic to mesotrophic plinthic catenas (MacVicar et al. 1974) (Preez, July 2018)

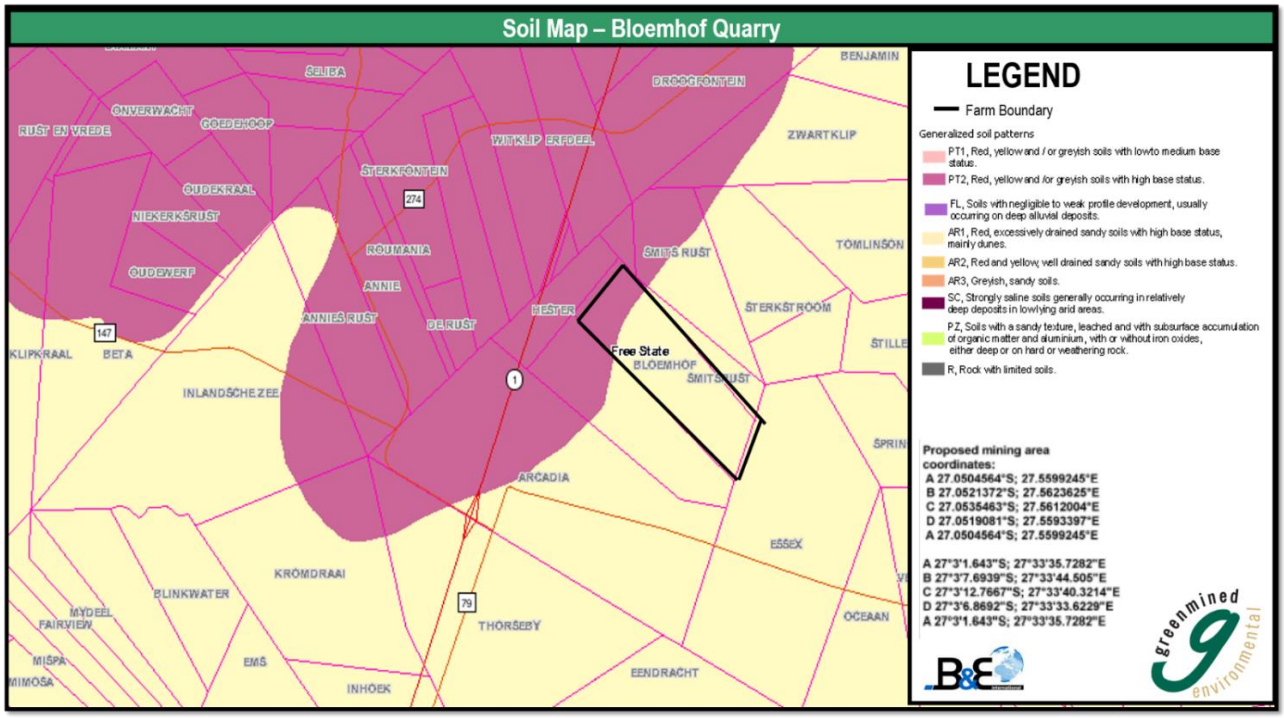


Figure 11: Soil Patterns of the Proposed Bloemhof Quarry.

iv. Topography

The topography of the area consists of level plains with some relief. The topography of the landscape is flat with deep sandy-loam deposits. Scattered depressions are present region. The landscape is drained by the Rietspruit which is a tributary of the Renoster River (Preez, July 2018).

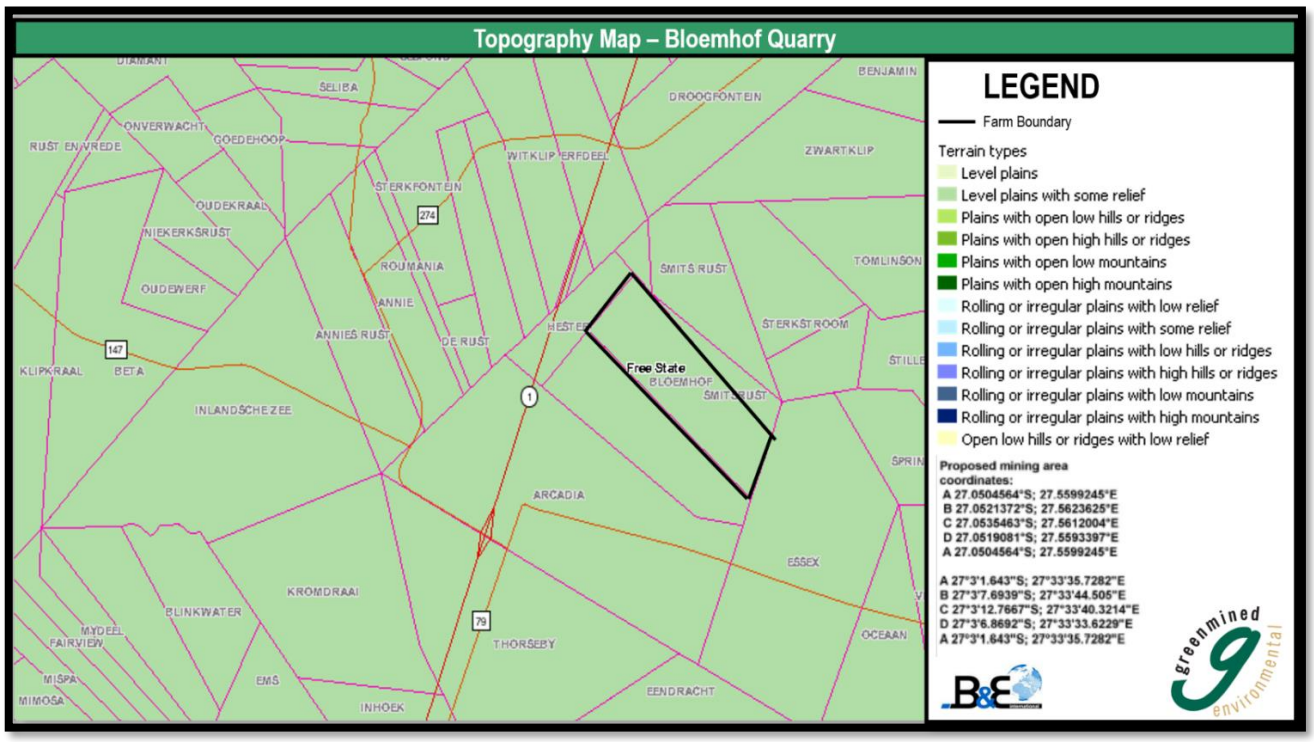


Figure 12: Topography of the Proposed Bloemhof Quarry.

v. Land Use and Land Capability

The land capability of the farm consists out of high potential arable land to very high potential arable land. The northern side where the wetland is located is not arable. The land capability of the area consists of marginal potential arable land. Land use is predominantly agricultural (grazing for cattle) (HCAC, 2018).

The project site is situated in an agricultural area. Most of the arable land is used for crop production. The natural veld is used for cattle grazing and to a lesser extent game farming (Preez, July 2018).

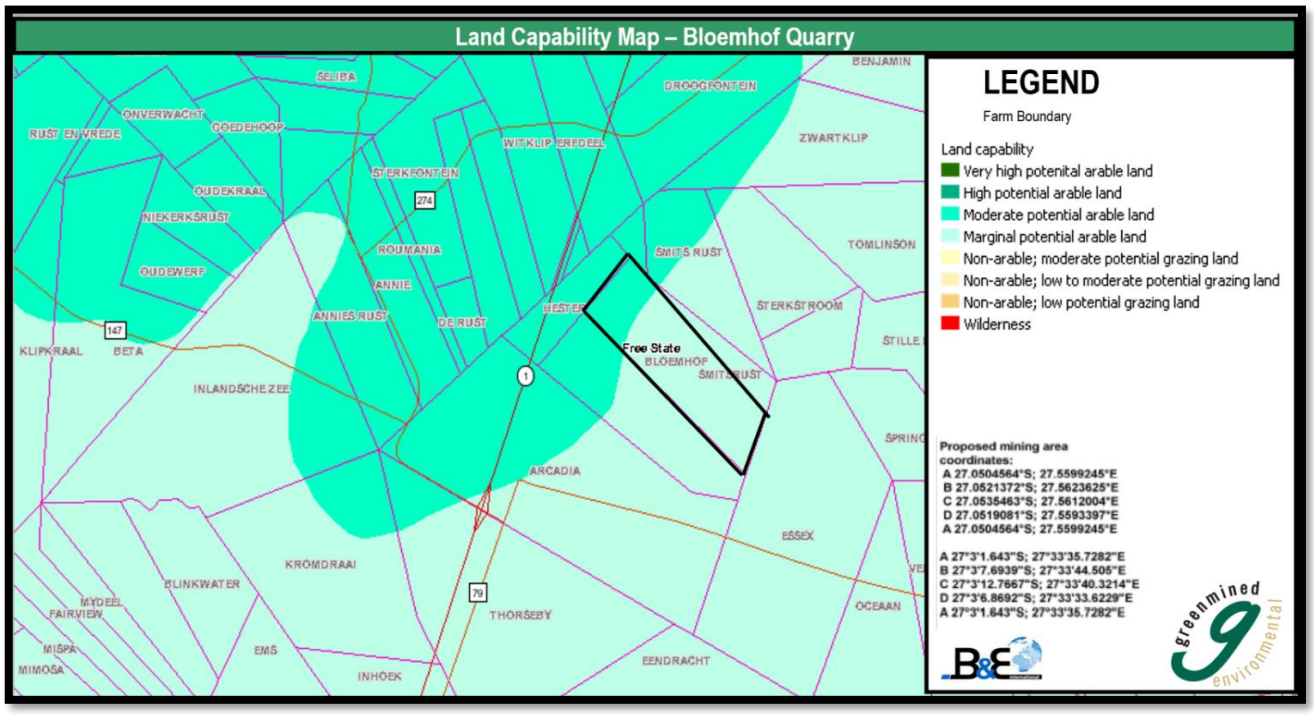


Figure 13: Land capability of the Proposed Bloemhof Quarry.

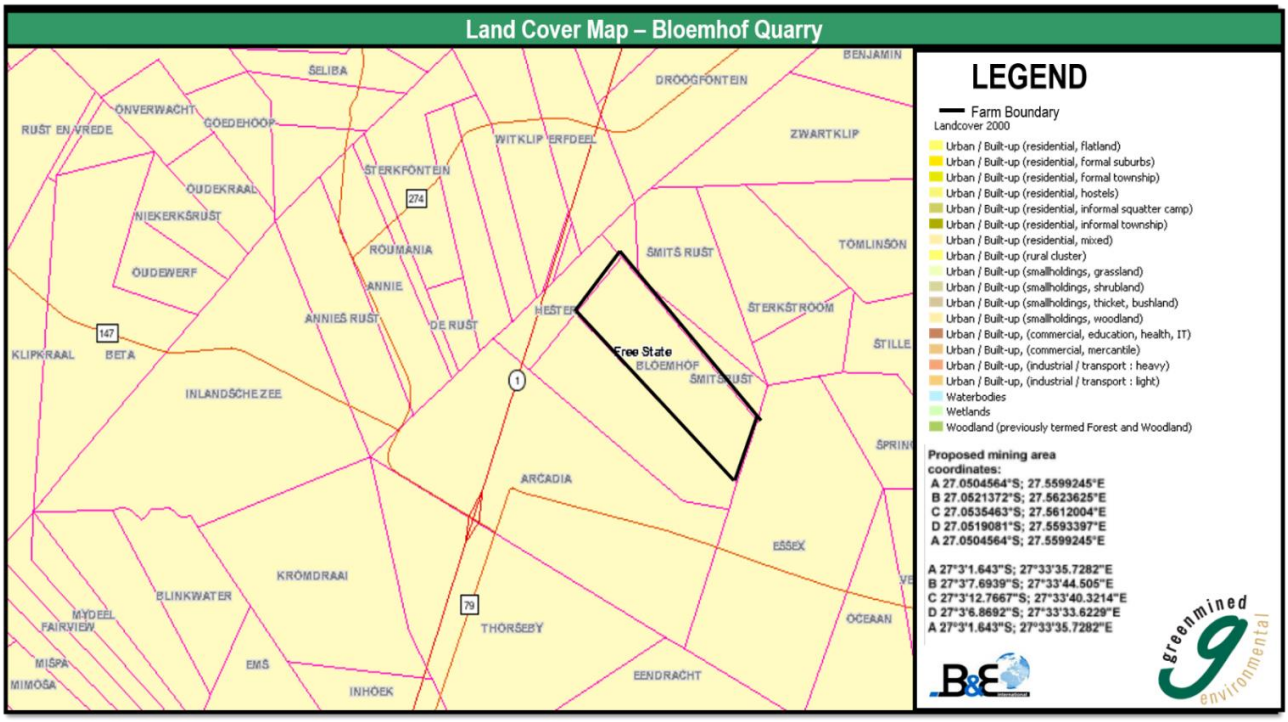


Figure 14: Land cover of the Proposed Bloemhof Quarry.

vi. Surface and Ground water

The proposed quarry falls within the Middle Vaal Water Management Area. The Middle Vaal WMA is located downstream of the confluence of the Vaal and the Rietspruit Rivers and upstream of Bloemhof Dam. It extends to the headwaters of the Schoonspruit River in the north and the Vet River in the south, covering a total catchment area of 52 563 km^2. The Middle Vaal WMA includes parts of Free State and North-West provinces. Major rivers in the Middle Vaal Water Management Area include the Schoonspruit, Rhenoster, Vals, Vet and Vaal rivers. The tertiary drainage areas in the Middle Vaal WMA comprises C24, C25, C41, C43, C60 and C70. The proposed quarry falls within the quaternary catchment area of C24C.

No river diversions will be needed. There is an artificial wetland located in the north eastern corner of the property. Ground water will not be affected with this activity of mining. Although the depth of the groundwater is unknown, historical photo data proofs that the quarry only contains water after heavy rain spells, mining at the proposed site is expected to be up to an approximate depth of 12m but might be extended to a total depth of up to 30 m and therefore the impact on the groundwater will need continuous monitoring should ground water be intersected. It should be noted that the quarry pit has been used in the past by the landowner for a surface water dam and as a fishing spot. As per the landowner agreement, Inzalo needs to relocated the fish in the quarry before any mining can commence.

A portion of the existing quarry is currently filled with rain water; mining at the site is not anticipated to be affected by the water in the quarry as a wall will be left between the existing pit and the proposed mining area. Authorisation for this use was received on the 12th of August 2019 in terms of a general authorisation as published in schedule to notice 665 in the Government Gazette of 6 September 2013.

The following water uses needs to be included in the authorisation:

WATER USE	PURPOSE / DESCRIPTION
Section 21 (a)	Taking water from a water resource – Bloemhof Quarry Pit @ 3960 m^3 per annum; Dust suppression
Section 21 (j)	Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people - *Quarry*

a. Sensitive landscapes

The study area falls within the Highveld Aquatic Ecoregion. According to the NFEPA database the study area falls within the Middle Vaal Water Management Area (WMA), and the subWMA is indicated

as the Middle Vaal. This subWMA is not regarded as important in terms of fish sanctuaries, rehabilitation or corridors. The subWMA is not considered important in terms of translocation and relocation zones for fish.

The subWMA is also not listed as a fish-FEPA. the Middle Vaal river is classified as having a Present Ecological States (PES) as a Class E river, with EI classification of moderate and an ES classification of low. The NFEPA databases indicates that there are pans (wetlands) present within the region as well as on the project site. the NFEPA database also indicates that there are no RAMSAR wetlands within the study area or within 500m of the study area (Preez, July 2018).

Table 1: VEGRAI

Summary of results of the VEGRAI assessments conducted for the unnamed ephemeral watercourse and rock quarry.

Features	Present State Score (%)	Present State Category
Unnamed ephemeral watercourse	68	C
Rock quarry	40	D

Table 2: WET-IHI

Summary of results of the WET-IHI assessments conducted for the unnamed ephemeral watercourse and rock quarry

Features	Present State Score (%)	Present State Category
Unnamed ephemeral watercourse	65	C
Rock quarry	43	D

Table 3: WET-HEALTH (Overall PES)

Summary of results of the WET-Health assessments conducted for the unnamed ephemeral watercourse and rock quarry

Feature	Hydrology		Geomorphology		Vegetation		Overall PES Category
	Impact score	Change score	Impact score	Change score	Impact score	Change score	
Unnamed ephemeral watercourse	C	↓	B	↓	C	↓	C
Rock quarry	C	↓	D	↓	C	↓	C

The overall PES Category for the unnamed ephemeral watercourse is a C which means that the system is a moderately modified system where the loss of natural habitat, biota, and basis ecosystem functions have occurred but the basic ecosystem functions are still predominantly unchanged. The overall PES Category for the rock quarry is also a C.

Ecological functionality and ecological service provision

Wetland and riparian ecological functionality and ecological service provision was assessed utilising the method described by Kotze et al. (2008). The results of the Eco-Services assessment are summarised in the table below.

Table 4: Summary table of the wetland and riparian ecological function

Summary of the wetland and riparian ecological function and service provision assessments for the unnamed ephemeral watercourse and rock quarry.

Ecosystem	Score	Category
Unnamed ephemeral watercourse	0.9	Moderately - low
Rock quarry	1.3	Intermediate

These results indicate that unnamed ephemeral watercourse and the rock quarry's riparian wetlands ecological functionality and ecological service provision are calculated to be respectively moderately - low and intermediate. The watercourse and rock quarry scored low values in terms of tourism, recreation, education and research and they also do not play any form of cultural importance to the surrounding communities.

Ecological importance and sensitivity (EIS)

Table 5: EIS

Summary of the wetland and riparian vegetation's Ecological Importance and Sensitivity (EIS) assessments for the unnamed ephemeral watercourse and rock quarry.

Ecosystem	Score	Category
Unnamed ephemeral drainage line	0.4	D
Rock quarry	1.3	C

These results indicate that the unnamed ephemeral watercourse's riparian vegetation are calculated to fall within and EIS Category D, indicating that this system is largely modified. The rock quarry scored a C which means that the system is moderately modified in terms of ecological importance and sensitivity (EIS). It is also an indication that these system is considered to be ecologically un-important and not sensitive on a provincial and local scale.

Recommended ecological category (rec)

The Recommended Ecological Category (REC) for the unnamed ephemeral watercourse's and the quarry's riparian wetlands wetland features were determined taking into account the results of the IHI, wetland and riparian function, EIS and the WET-Health assessments. The REC deemed appropriate for the wetland and riparian features are presented in the table below.

Table 6: REC Categories

Summary of the REC categories assigned to the various features for all riparian and wetland features within the project site.

Features	REC Category
Unnamed ephemeral drainage line	Upper D
Rock quarry	Upper C

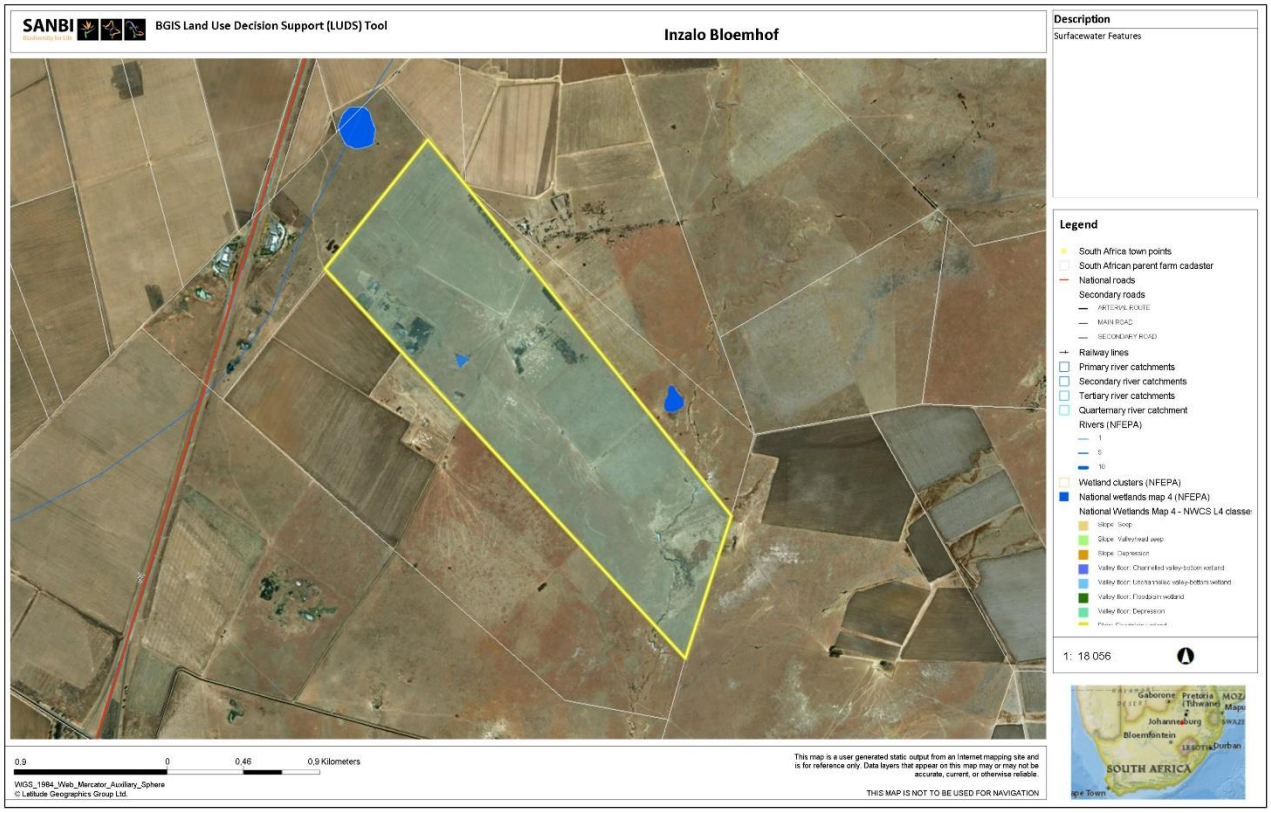


Figure 15: Wetlands of the proposed Bloemhof Quarry

During the site assessment of the banks of the unnamed watercourse was assessed. It should be noted that although the drainage line/riparian features identified may extend beyond the project site, only portions located within the study area (including the 500m buffer) were assessed and ground-trothed. Furthermore, the study focused on features located within the study area and features located outside of this area were delineated using digital satellite imagery with limited field verification. Nonetheless, the potential impacts of activities such as 53 crop production, erosion and clearing of natural vegetation within the greater catchment were taken into consideration during the assessment.

All wetland and watercourse/riparian features identified within the study area were classified as Inland Systems falling within the Highveld Aquatic Ecoregion. The table below presents the classification on level 3 and 4 of the wetland classification system.

Table 7: Characterisation of the riparian and wetland systems within the study area according to the classification system. (Preez, July 2018)

System	Level 3: Landscape unit	Level 4: Hydro-geomorphic Unit	
		HGM type	Longitudinal zonation / landform / Inflow drainage
Unnamed watercourse	Plain	River	Lowland river with active channel & riparian zone

Wetland habitat is land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil (NWA; Act No. 36 of 1998).

Riparian habitat includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas. The rivers and non-perennial drainage lines with riparian characteristics are defined as watercourses, whilst the smaller ephemeral drainage lines without riparian zones are not considered wetlands or systems with an associated riparian zone but may still be defined as watercourses if the features have floodlines applicable to them.

Table 8: Description of the assessment of the watercourse on the project site. (Preez, July 2018)

Site features	Comments
Upstream and catchment features	The catchment area is mixture of natural grassland and ploughed crop fields. There are numerous areas near the watercourse where mining activities have disturbed the natural vegetation. The deeper sandy soils in the catchment have been ploughed and are currently used to produce mainly maize. Dirt roads are present in the catchment area.

Type of wetland (Ephemeral / perennial)	The watercourse is a 1st order stream and is an ephemeral one. A small man-made dam was built in the stream downstream of the project site. No pans are situated on the project site
Other sources of input (springs etc.)	None
Downstream significance	A small man-made dam was built in the stream downstream of the project site. The dams only have water after significant rainfall events
Vegetation characteristics	The vegetation is dominated by a mix of grasses and sedges.
Presence of algae	None. Watercourse was dry during time of assessment
Visual indication of and impacts on aquatic fauna	The small man-made dam is in a good condition and is utilised by cattle
Depth characteristics	The watercourse was dry during the time of the assessment.
Flow conditions	The watercourse was dry during the time of the assessment.
Water clarity	The watercourse was dry during the time of the assessment.
Water odour	The watercourse was dry during the time of the assessment.
Erosion potential	There is a low potential for erosion due to the small size of the catchment and the good vegetation cover

Table 9: Description of the assessment of rock quarry. (Preez, July 2018)

Site features	Comments
Upstream and catchment features	The catchment area is mixture of natural grassland and ploughed crop fields. There are numerous areas near the watercourse where mining activities have disturbed the natural vegetation. The deeper sandy soils in the catchment have been ploughed and are currently used to produce mainly maize. Dirt roads are present in the catchment area
Type of wetland (Ephemeral / perennial)	The wetland is a man-made one. The quarry walls are 4-5m high with a ramp to access the quarry floor. The quarry floor is inundated and has a perennial character
Other sources of input (e.g. springs etc.)	Groundwater
Downstream significance	None. The quarry has no outflow
Riparian zone characteristics	The riparian zone is relatively narrow. The riparian zone is dominated by a mix of grasses, reeds, bulrush and sedges. *Potamogeton crispus* is the only floating aquatic plant.
Presence of algae	At the time of the assessment. No algal proliferation was noted.
Visual indication of and impacts on aquatic fauna	At the time of the assessment no pollution or turbidity were noted in the quarry
Depth characteristics	The depth varies depending on the amount of rainfall of the season.
Flow conditions	No flow occurs in the quarry. Thus the flow diversity is low. This limits the diversity and sensitivity of the aquatic community to some degree.
Water clarity	The water in the quarry was clear
Water odour	No odours were noted
Erosion potential	The entire quarry consists of dolerite. There is a zero potential for

Much of the functionality of the unnamed stream and riparian features has been altered due to anthropogenic activities such as dolerite mining and agricultural activities. Currently, the water does not have a real value for the local community however the water in dam is used by the farmer as a watering point for domestic animals (Preez, July 2018).

1. National Freshwater Priority Areas (NFEPA)

The FEPA database was consulted with regards to areas in close proximity to or traversed by the project site that may be of ecological importance. Aspects applicable to the study area are discussed below:

- The study area falls within the Highveld Aquatic Ecoregion,
- According to the NFEPA database the study area falls within the Middle Vaal Water Management Area (WMA), and
- the subWMA indicated for the study area is the Middle Vaal;
- The subWMA is not regarded important in terms of fish sanctuaries, rehabilitation or corridors;
- The subWMA is not considered important in terms of translocation and relocation zones for fish;
- The subWMA is not listed as a fish-FEPA;
- The DWS database indicates that the Middle Vaal River is classified as having a Present Ecological State (PES) as a Class E river, with EI classification of Moderate and an ES classification of Low;
- The NFEPA database indicates that there are pans (wetlands) present within the region as well as on the project site;
- The NFEPA database indicates that there are no RAMSAR wetlands within the study area or within 500m of the study area;
- According to the National List of Threatened Terrestrial Ecosystems (2011) the study area falls in a threatened ecosystem namely the Vredefort Dome Granite Grassland (Gh 14) which is incorrect because the underlying geology of the site is dolerite and sediment of the Karoo. The vegetation of the site actually belongs to the Central Free State Grassland (Gh 6) which is not a threatened ecosystem.
- According to the National Biodiversity Assessment (2011), the study area is not located within either a formal or an informal protected area.
- According to Free State Biodiversity Plan (2015) the entire project site is classified as an Ecological Support Areas (ESA 2). The nearby arable soils have been ploughed to produce maize and sunflower.
- The man-made dam on the property is a small NFEPA – listed aquatic system
- On this site is a rock quarry and a stockpile area.

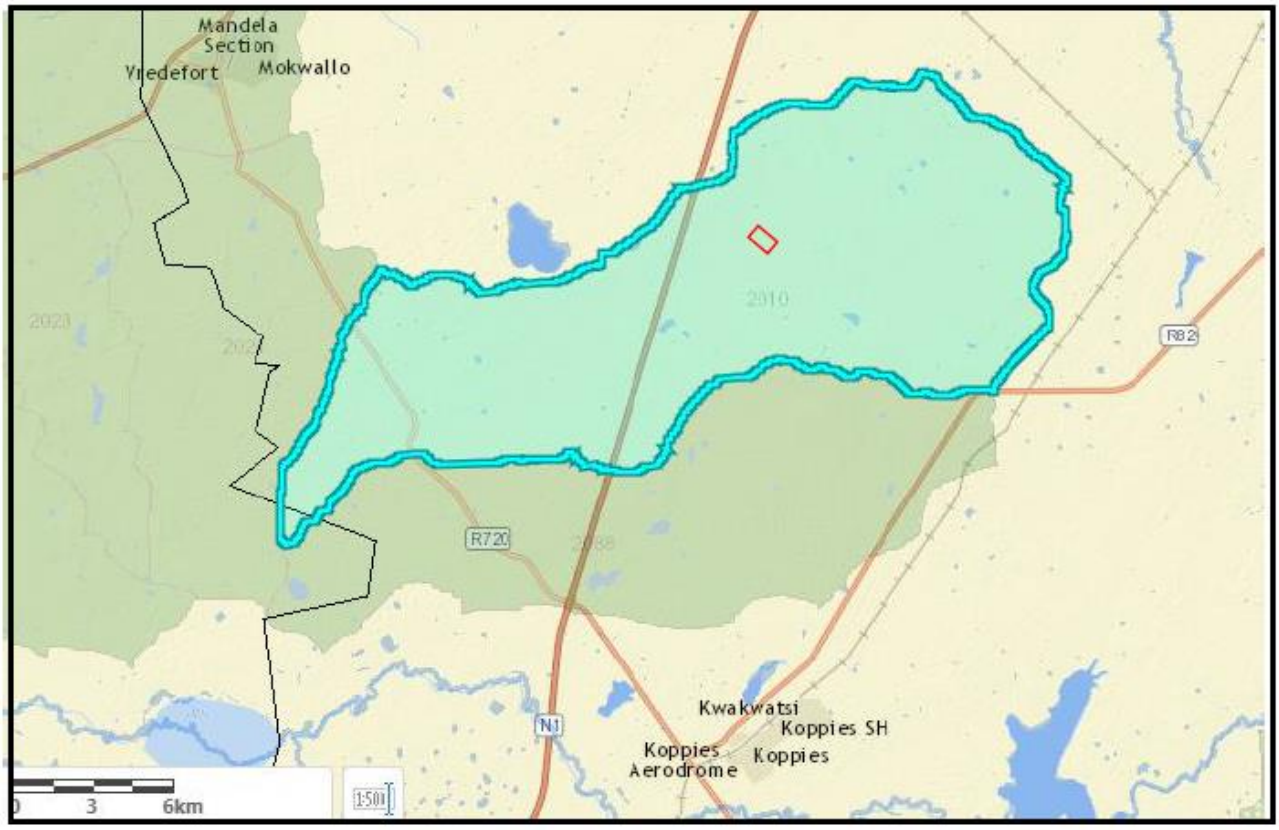


Figure 16: The project area (red polygon) in relation to the catchment of the Rietspruit (turquoise polygon). The blue lines and blue dots are NFEPA listed pans, dams and riparian features

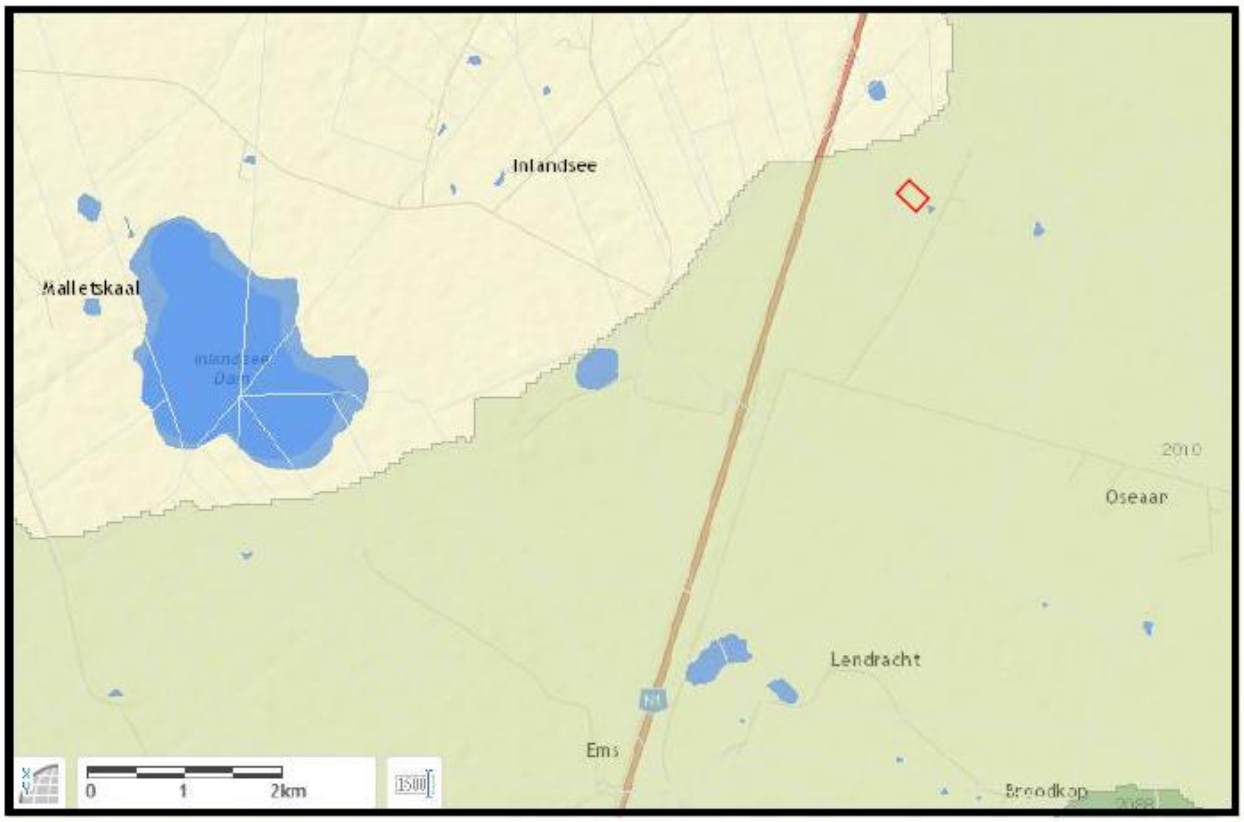


Figure 17: The blue polygons illustrate the approximate localities of NFEPA-listed pans, dams and riparian features in relation to the project area (red polygon).

2. Riparian Vegetation Response Index (VEGRAI)

The VEGRAI method was applied in order to assess the impacts of modifications to the system on the riparian vegetation of the watercourse. The riparian zones located along the watercourse have been impacted by the growth of alien vegetation. The resultant encroachment of alien vegetation has led to an impediment of water flow and displacement of indigenous floral and faunal species within the riparian areas. Furthermore, all of these systems have been impacted upon by mining and agriculture (crop cultivation and grazing of domestic livestock) activities. The riparian features found in the unnamed ephemeral watercourse a received a score of 68%, indicating that the VEGRAI Ecological Category falls in Category C indicating a moderately modified system where the loss of natural habitat, biota, and basic ecosystem functions have occurred. The VEGRAI score for the quarry's vegetation is 40% which means that the ecosystem is largely modified system where the loss of natural habitat, biota, and basis ecosystem functions have occurred but the basic ecosystem functions are still predominantly unchanged.

Table 10:Summary of results of the VEGRAI assessments conducted for the unnamed ephemeral watercourse and rock quarry.

Features	Present State Score (%)	Present State Category
Unnamed ephemeral watercourse	68	C
Rock quarry	40	D

Loss of marginal and non-marginal vegetation, as a result of disturbance of the riparian vegetation to access the stream, grazing by livestock, etc. has resulted in encroachment of some invasive alien species in many sections of the riparian zone. Furthermore, excavations (mining) and erosion is evident along the unnamed ephemeral watercourse on the project site.

3. Index of Habitat Integrity

The Index of Habitat Integrity (IHI) as described by the DWS (2007) was utilised to assess the present Habitat Integrity state of the watercourse on the properties.

Wetland health is defined as a measure of the similarity of a wetland to a natural or reference condition. “Deviations” from this natural or reference state, particularly the extent of human impacts which may have caused the wetland to differ from this natural state, are considered when ascertaining the “health” of a wetland (Macfarlane et al., 2008).

The table below provides a summary of the IHI results for each group of features and the rivers which are discussed in detail in the sub-sections that follow.

Table 11: Summary of results of the WET-IHI assessments conducted for the unnamed ephemeral watercourse and rock quarry

Features	Present State Score (%)	Present State Category
Unnamed ephemeral watercourse	65	C
Rock quarry	43	D

Unnamed ephemeral watercourse

Impacts from the upstream areas and disturbance of the stream within the project site are the predominant modifiers to the system. These factors have resulted in a reduction of indigenous riparian vegetation with the resultant influx of alien vegetation contributing to the change in the natural functioning of the riparian zones of the watercourse.

The score indicates that the watercourse has undergone some loss and change of natural habitats. The system has been exposed to moderate change in the character of the stream.

The WET-IHI score for the unnamed ephemeral watercourse is 65%, indicating that the WET-IHI category is an C meaning that the system is moderately modified with a loss of natural habitat, biota, and basic ecosystem functions have occurred (Table 8). However, this drainage line still performs an important ecological function insofar as it transports water down into the man-made dam and larger stream systems.

The watercourse is an ephemeral system and is subjected to periods of no to low flow during the drier winter months. These periods of no flow result in an accumulation of sediment within the system leading to sediment deposition and infilling of the channel. During the wetter month's floods can result in the removal of these deposits due to the lack of soil stability as a result of the increased alien vegetation within the riparian zones. Additional water inputs originating from such runoff may alter hydrological patterns to some extent.

Quarry

The WET-IHI score for the quarry is 43% which means that the ecosystem is largely modified system where the loss of natural habitat, biota, and basis ecosystem functions have occurred but the basic ecosystem functions are still predominantly unchanged. The pollution is limited and stopped when the mining operation ceased some years ago. Due to the depth of the quarry it can be regarded as a closed system.

4. Wet-Health Assessment

A Level 1 Wet-Health assessment of the floodplain HGM Units was undertaken. Three modules, namely hydrology, geomorphology and vegetation, were assessed as a single unit for the HGM Units and subsequently an area weighted score was obtained for the HGM Units. The potential impacts of activities such as agriculture, altered hydrological functions and clearing of natural vegetation within the greater catchment were taken into consideration during the assessment. These results are summarised in the table below.

Table 12: Summary of results of the WET-Health assessments conducted for the unnamed ephemeral watercourse and rock quarry

Feature	Hydrology		Geomorphology		Vegetation		Overall PES Category
	Impact score	Change score	Impact score	Change score	Impact score	Change score	
Unnamed ephemeral watercourse	C	↓	B	↓	C	↓	C
Rock quarry	C	↓	D	↓	C	↓	C

The overall PES Category for the unnamed ephemeral watercourse is a C which means that the system is a moderately modified system where the loss of natural habitat, biota, and basis ecosystem functions have occurred but the basic ecosystem functions are still predominantly unchanged. The overall PES Category for the rock quarry is also a C. This system is a man-made system which consists of a deep void filled with groundwater. Some aquatic plants have colonised the aquatic habitat.

Impacts on the hydrology of the unnamed ephemeral watercourse include the increased runoff volumes from surrounding degraded and cleared areas associated with the mining, which places this module within a Category C. Little topographic alterations associated with surrounding human activities have also affected the HGM Units, resulting in geomorphological modifications also falling within Category B. The vegetation assemblage of the study area has been undergone extensive impact as a result of natural vegetation clearing practices for firewood as well as a high level of alien plant proliferation throughout the study area. With this in mind the wetlands achieved an overall score which placed the module in a Category C.

In the case of the quarry the site it is a man-made system. The hydrology is still relatively undisturbed for the period since mining activities ceased. It scored a Category C. Topographic alterations associated with mining is extensive because it is a man-made system. The resulting geomorphological modifications in the quarry scored a Category D. The vegetation assemblage of the quarry site developed after mining activities ceased and groundwater covered the quarry floor. The vegetation in the quarry is largely untouched. With this in mind the overall score of this man-made system is a C.

What needs to be considered is that if the disturbance and spread of alien invasive plants are allowed to continue unchecked and mining activities are not planned for properly, and without proper rehabilitation it is highly likely that the watercourse area in the project site will be further degraded and it will suppress the wetland function capabilities.

5. Riparian and Wetland Function Assessment

The ecological functions and service provision for the watercourse's riparian zones were assessed utilising the WET-Eco Services method (Kotze et. al. 2009) as described in the methodology (Chapter 2) of this report. The results of the assessments are tabulated and discussed below.

Table 13: Results of the ecological function and services provision assessment applied to the unnamed watercourse and quarry's riparian features within the project site.

Ecosystem service	Wetlands's riparian vegetation	
	Quarry	Unnamed stream
1. Flood attenuation	2.3	2.4
2. Streamflow regulation	0.8	0.7
3. Sediment trapping	2.3	1.5
4. Phosphate trapping	1.7	2.0
5. Nitrate removal	1.0	2.0
6. Toxicant removal	1.7	1.7
7. Erosion control	1.5	3.2
8. Carbon storage	0.3	1.7
9. Maintenance of biodiversity	0.7	1.3
10.Water supply for human use	1.0	0.9
11. Natural resources	0.0	0.0
12. Cultivated foods	0.8	0.8
13. Cultural significance	0.0	0.0
14.Tourism and recreation	0.6	0.6
15. Education and research	1.0	1.0
16. Threats	0.0	0.0
17. Opportunities	0.0	2.0
TOTAL	**15,7**	**21,8**
Mean	**0.92**	**1,28**

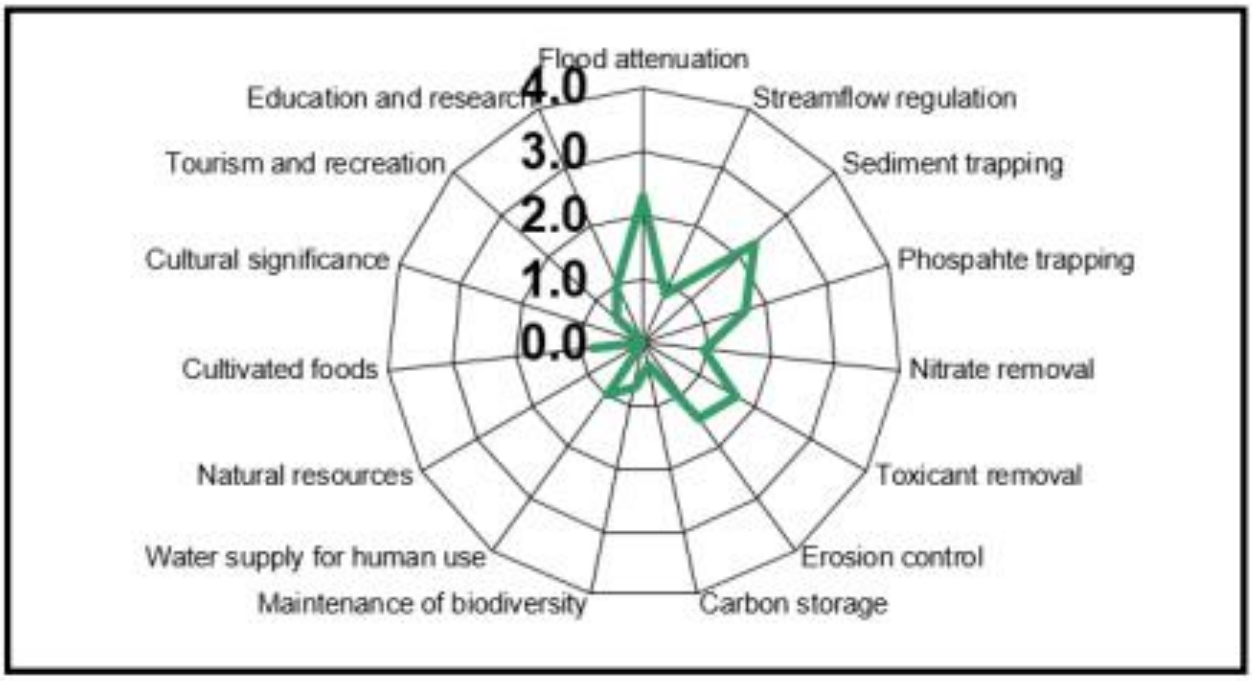


Figure 18: A spider diagram of the ecological function and services provision assessment applied to the quarry's riparian vegetation on the project site.

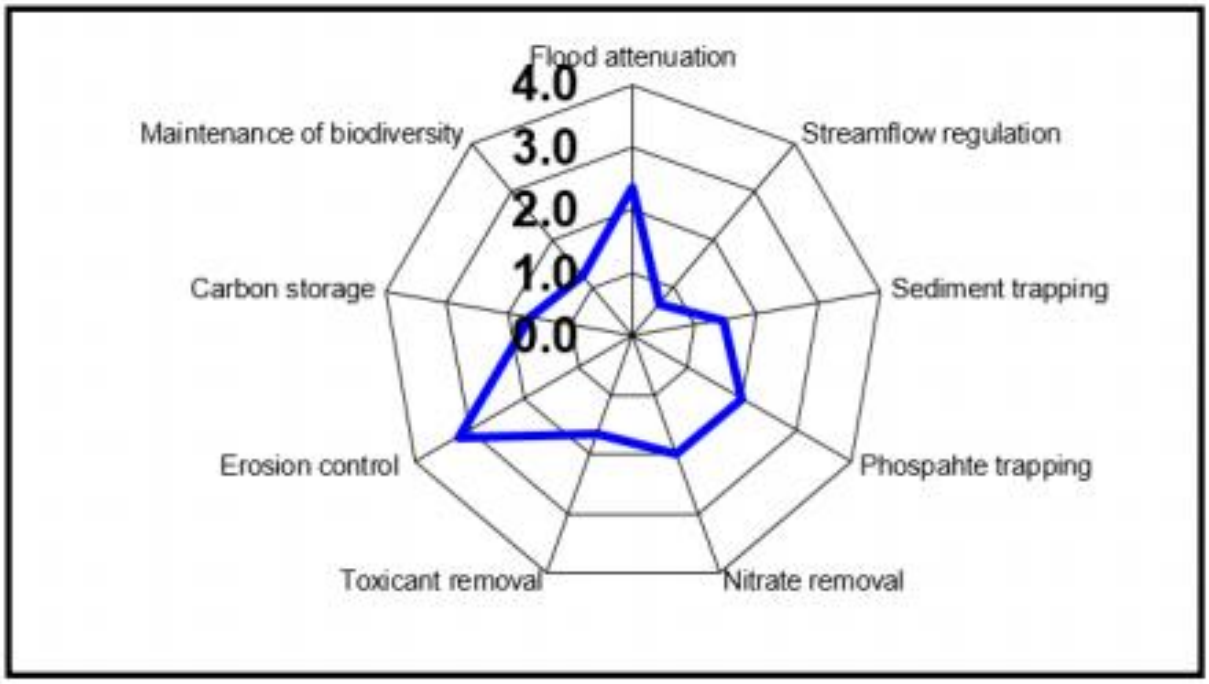


Figure 19: A spider diagram of the ecological function and services provision assessment applied to the unnamed streams riparian vegetation on the project site.

The ecological functions and service provision for these hydro-geomorphic units and the hydro-geomorphic units as a whole was calculated in Table 4.8. Biodiversity maintenance is low in the quarry's riparian vegetation. The presence of exotic species has a limiting factor in this area in terms of biodiversity maintenance and support. The ecological functions and service provision score for the quarry on the project site is 0,9 which is Moderately – Low.

The ecological functions and service provision score for the unnamed stream on the project site is 1,3 which is an Intermediate score. The watercourse and quarry scored low values in terms of tourism, recreation, education and research and they also do not play any form of cultural importance to the surrounding communities.

6. Ecological Importance and Sensitivity (EIS) Assessment

The EIS assessment was applied to all watercourse/riparian and wetland features within the study area in order to ascertain the levels of sensitive and ecological importance of the features, as well as to assist in informing a suitable REC for each. The results of these assessments are summarised in the table below.

Table 14: Results of the EIS assessments all riparian and wetland features within the project site.

Determinant		Unnamed stream's vegetation	Quarry's vegetation	Confidence
	PRIMARY DETERMINANTS			
1	Rare & endangered species	0	0	4
2	Populations of unique species	0	0	4
3	Species/Taxon richness	0	0	4
4	Diversity of habitat types or features	1	0	4
5	Migration route/breeding & feeding site for wetland species	0	0	4
6	PES as determined by WET-Health assessment	2	1	4
7	Importance in terms of ecosystem function & service provision	1	1	4
	MODIFYING DETERMINANTS			4
8	Protected Status according to NFEPA WetVeg	1	0	4
9	Ecological integrity	1	3	4
TOTAL		**6**	**5**	**5**
MEAN		**0,66**	**0,55**	**0,5**
Overall EIS		**D**	**D**	

These results indicate that both the unnamed watercourse and the quarry's riparian vegetation are calculated to fall within and EIS Category D, indicating that this system is largely modified. It is also an indication that these systems are considered to be ecologically un-important and not sensitive on a provincial and local scale.

7. Recommended Ecological Category (REC)

The Recommended Ecological Category for the riparian features along the watercourse and quarry were determined taking into account the results of the IHI, wetland function, and EIS 61 assessments. These assessments show that all riparian and seasonal drainage line features within the project site have to an extent undergone fairly significant levels of transformation as a result of historical and current impacts disruption of the hydrological cycle and alien vegetation encroachment. Nevertheless, despite the lowered ecological integrity of these systems, they are considered to provide important ecological services. The REC estimated appropriate for the watercourse/riparian and seasonal drainage line features are presented in table below.

Table 15: Summary of the REC categories assigned to the various features for all riparian and wetland features within the project site.

Features	REC Category
Unnamed watercourse's riparian vegetation	Upper D
Quarry's riparian vegetation	Upper D

Where applicable mitigation measures to lower the impacts associated with mining activities must be implemented in order to at minimum, retain current levels of ecological integrity and functioning. It is preferable however that suitable rehabilitation measures be implemented, particularly to curb erosion, and to implement an invasive weed removal program to clear the drainage lines and riparian areas in order to improve the Present State of these and to improve the ecological service provision by these systems.

8. Delineation and Sensitivity Mapping

All features were delineated on a desktop level with the use of digital satellite imagery and topographical maps. Portions of the features were then verified during the field survey according to the guidelines advocated by DWS (2005, 2008) and the watercourse/riparian delineations as presented in this report are regarded as a best estimate of the temporary and riparian zone boundaries based on the site conditions present at the time of assessment. Ground-truthing of riparian boundaries focused on those areas that were accessible as well as within the proposed project site footprint.

During the assessment, the following indicators were used to ascertain the boundaries of the perennial drainage lines with riparian characteristics and the wetland features:

- Terrain units were used as the primary indicator, as the drainage lines and depressions were the most likely areas through which water will flow. In some of the riparian areas, the presence of alien plant species made it difficult discern riparian / drainage line boundaries;
- Vegetation, although transformed, was considered informative at many features;
- Soil form was considered; and the presence of mottles (soils with variegated colour patterns) was used as an indicator for wetlands and riparian boundaries in some instances. In some areas the mottling of soils did not provide an accurate delineation of boundaries, and as such the above mentioned characteristics were used in conjunction to determine boundaries.

Legislative requirements were used to determine the extent of buffer zone required for each group depending on whether a group is considered wetland/riparian habitat or not. As such, if any activities are to take place within 32 meters of a wetland or watercourse or the 1:100-year flood lines authorisation in terms of the relevant regulations of NEMA will be required. In addition, the Section 21 of the National Water Act and Regulation 1199 of 2009 as it relates to the NWA will also apply and therefore a Water Use License will be required for the proposed development.

Figure 20: The blue lines indicate the unnamed watercourse and its 32m buffer (red line). The yellow arrow indicated the quarry filled with water. The orange arrows indicate the disturbed areas (mining permit areas), the red arrows indicate stockpiles of crushed material and spoil material and the blue arrow indicates the manmade farm dam.

i. Flora

The most recent description of the broader study area's vegetation is the general description by Mucina & Rutherford (2006) relating to the vegetation which is considered to be the "Vegetation of South Africa, Lesotho and Swaziland" as well as its accompanying map of the country by (Mucina et al., 2005). This memoir contains species information and a comprehensive conservation assessment of all vegetation types.

According to Mucina & Rutherford (2006) (Figure 21), two vegetation types are present at the project site. The largest portion of the project site is covered by the Vredefort Dome Granite Grassland (Gh 14) and Central Free State Grassland (Gh 6). This is incorrect because the underlying geology of the site is dolerite and sediment of the Karoo meaning that the entire project site is covered by Central Free State Grassland (Gh 6).

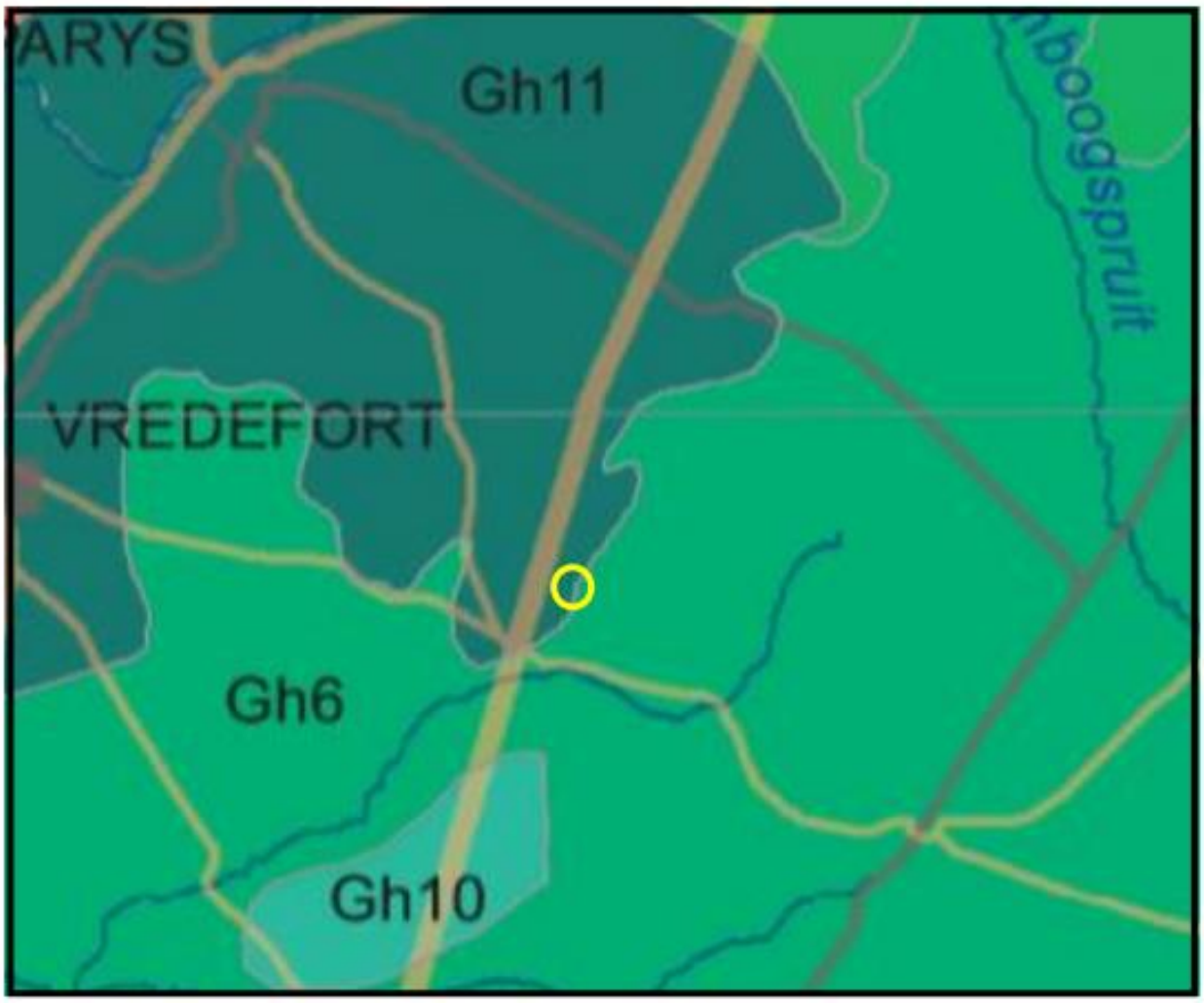


Figure 21: The vegetation map of the project site (yellow polygon) and the surrounding area.

- Vredefort Dome Granite Grassland (Gh 14)
- Central Free State Grassland (Gh 6) (Mucina & Rutherford, 2006).

a. National List of Threatened Terrestrial Ecosystems for South Africa (2011)

The National threatened ecosystem classification is based on Mucina & Rutherford's map of 2006. The vegetation types of South Africa have been classified according to their conservation status which is, in turn, assessed according to the degree of transformation and rates of conservation. The status of a habitat or vegetation type is based on how much of its original area still remains intact relative to various thresholds. On a national scale these thresholds are as depicted in the table below, as determined by best available scientific approaches (Driver et al. 2005). The level at which an ecosystem becomes Critically Endangered differs from one ecosystem to another and varies from 16% to 36% (Driver et al. 2005).

Table 16: Determining ecosystem status (from Driver et al. 2005). *BT = biodiversity target (the minimum conservation requirement.

Habitat remaining (%)		
80–100	least threatened	LT
60–80	vulnerable	VU
*BT–60	endangered	EN
0–*BT	critically endangered	CR

Threatened ecosystems which are in need of protection (GN1002 of 2011), was published under the National Environment Management: Biodiversity Act (Act No. 10 of 2004). It lists national vegetation types that are afforded protection on the basis of rates of transformation. The threshold for listing in this legislation is higher than in the scientific literature, which means there are fewer ecosystems listed in the National Ecosystem List versus in the scientific literature.

The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) provides for listing of threatened or protected ecosystems, in one of four categories: critically endangered, endangered, vulnerable or protected. Threatened ecosystems are listed in order to reduce the rate of ecosystem and species extinction by preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to conserve sites of exceptionally high conservation value (SANBI, BGIS).

Table 17: Conservation status of the vegetation type occurring in and around the study area.

Vegetation Type	Target (%)	Conserved (%)	Transformed (%)	Conservation Status	
				Driver et al., 2005; Mucina & Rutherford, 2006	National Ecosystem List (NEM:BA)
Vredefort Dome Granite Grassland (Gh 14)	24%	0%	48%	Endangred	Listed
Central Free State Grassland (Gh 6)	24%	4%	25%	Least threatened	Not Listed

Figure 21 and Figure 22 show that the Vredefort Dome Granite Grassland (Gh 14) and the Central Free State Grassland (Gh 6) are present on the project site. The National threatened ecosystem classification is based on Mucina & Rutherford's map. According to the National List of Threatened Terrestrial Ecosystems (2011) the project site falls in a threatened ecosystem namely the Vredefort Dome Granite Grassland (Gh 14) which is incorrect because the underlying geology of the site is dolerite and sediment of the Karoo Supergroup and not granite.

The vegetation of the entire project site actually belongs to the Central Free State Grassland (Gh 6) which is not a threatened ecosystem.

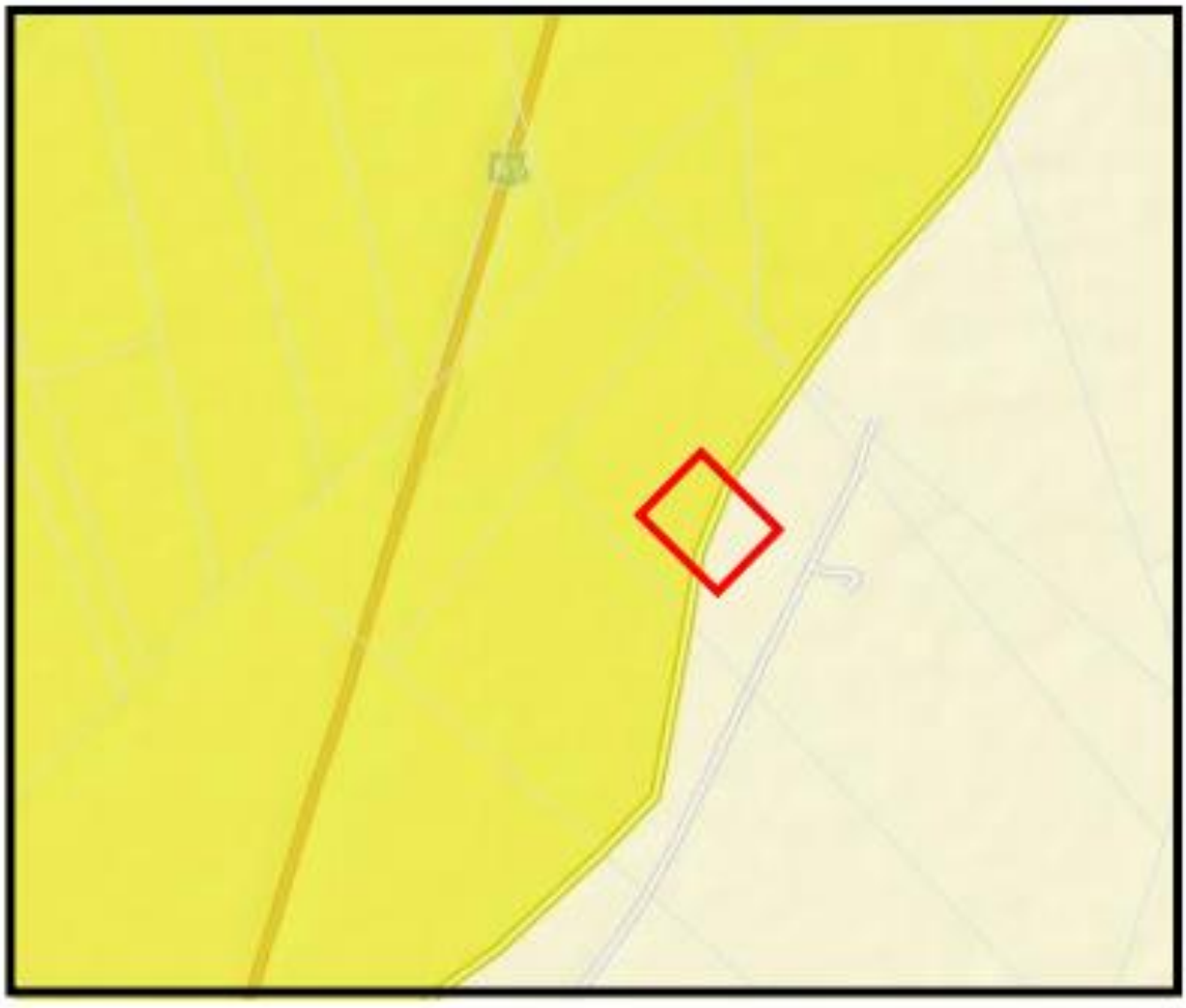


Figure 22: The vegetation map of the project site (yellow polygon) and the surrounding area.

- Yellow area - Vredefort Dome Granite Grassland (Gh 14)

- Camel coloured area - Central Free State Grassland (Gh 6) (Mucina & Rutherford, 2006) (Mucina & Rutherford, 2006).

b. Ecoregions

Ecoregion: Highveld Ecoregion. Main attributes: Table 18

Table 18: Summary of the main attributes of the Highveld Ecoregion

Main Attributes	Highveld
Terrain Morphology: Broad division (dominant types in bold) (Primary)	**Plains; Low Relief;** **Plains; Moderate Relief;** Lowlands; Hills and Mountains; Moderate and High Relief; Open Hills; Lowlands; Mountains; Moderate to high Relief Closed Hills. Mountains; Moderate and High Relief
Vegetation types (dominant types in bold) (Primary)	Mixed Bushveld (limited); Rocky Highveld Grassland; **Dry Sandy Highveld Grassland;** Dry Clay Highveld Grassland; **Moist Cool Highveld Grassland;** Moist Cold Highveld Grassland; North Eastern Mountain Grassland; Moist Sandy Highveld Grassland; Wet Cold Highveld Grassland (limited); Moist Clay Highveld Grassland; Patches Afromontane Forest (very limited)
Altitude (m a.m.s.l) (secondary)	1100-2100, 2100-2300 (very limited)
MAP (mm) (modifying)	400 to 1000
Coefficient of Variation (% of annual precipitation)	<20 to 35
Rainfall concentration index	45 to 65
Rainfall seasonality	Early to late summer
Mean annual temp. (°C)	12 to 20
Mean daily max. temp. (°C): February	20 to 32
Mean daily max. temp. (°C): July	14 to 22
Mean daily min. temp. (°C): February	10 to 18
Mean daily min temp. (°C): July	-2 to 4
Median annual simulated runoff (mm) for quaternary catchment	5 to >250

c. National Biodiversity Assessment (NBA, 2011)

The National Biodiversity Assessment (NBA) (2011) provides an assessment of South Africa's biodiversity and ecosystems, including headline indicators such as ecosystem threat status and ecosystem protection level, and national maps for the terrestrial, freshwater, estuarine and marine environments.

- According to the National Biodiversity Assessment (2011), the study area is not located within either a formal or an informal protected area.

d. Free State Biodiversity Plan (2015)

(a) Definitions and descriptions of Critical Biodiversity Areas of the Province

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic features in the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services. These form the key output of a systematic conservation assessment and are the biodiversity sectors inputs into multi-sectoral planning and decision making tools. The use of CBAs within the province follows the definition laid out in the guideline for publishing bioregional plans (Anon, 2008).

The identification and mapping of CBAs forms part of the biodiversity assessment of the province which will be used to inform the development of the Provincial Biodiversity Sector plans, bioregional plans, and also be used to inform Spatial Development Frameworks (SDFs), Environmental Management Frameworks (EMFs), Strategic Environmental Assessments (SEAs) and in the Environmental Impact Assessment (EIA) process in the province.

Simply put, the purpose of the CBA is to indicate spatially the location of critical or important areas for biodiversity in the landscape. The CBA, through the underlying land management objectives that define the CBA, prescribes the desired ecological state in which the province would like to keep this biodiversity. Therefore, the desired ecological state or land management objective determines which land-use activities are compatible with each CBA category based on the perceived impact of each activity on biodiversity pattern and process. According to the guidelines for bioregional plans, three basic CBA categories can be identified based on three high-level and management objectives (Table 19).

Table 19: Definitions and framework for linking CBAs to land-use planning and decision making guidelines based on a set of high-level land biodiversity management objectives (Adapted from the guidelines for bioregional plans (Anon 2008)).

CBA category	Land Management Objective
Critical Biodiversity Areas (CBAs) Definition: CBAs are areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses.	
Protected Areas (PA) & CBA 1	**Natural landscapes:** Ecosystems and species are fully intact and undisturbed. These are areas with high irreplaceability or low flexibility in terms of meeting biodiversity pattern targets. If the biodiversity features targeted in these areas are lost then targets will not be met. These are landscapes that are at or past their limits of acceptable change.
CBA 2	**Near-natural landscapes:** Ecosystems and species are largely intact and undisturbed. Areas with intermediate irreplaceability or some flexibility in terms of the area required to meet biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising the ability to achieve targets. These are landscapes that are approaching but have not passed their limits of acceptable change.
Ecological Support Areas (ESAs) Definition: ESAs are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and / or in delivering ecosystem services that support socio-economic development, such as water provision, food mitigation or carbon sequestration. The degree of restriction on land use and resource use in these areas may be lower than that recommended for critical biodiversity areas.	
ESA	**Functional landscapes:** Ecosystem is moderately to significantly disturb but still able to maintain basic functionality. Individual species or other biodiversity indicators may be severely disturbed or reduced. These are areas with a low irreplaceability with respect to biodiversity pattern targets only.
ONA (Other Natural Areas) and Transformed	Production landscapes: Manage land to optimisze sustainable utilisation of natural resources.

Figure 23: A map showing the project site (red polygon) in relation to the Critical Biodiversity and Ecological Support areas. Pink-coloured areas – Transformed areas (mainly crop fields) Olive-green-coloured areas – Semi-transformed areas (ESA 2) Light green-coloured areas – Semi-transformed areas (ESA 1)

According to the Free State Province's Biodiversity Sector plan (2015), the project site is classified having no Critical Biodiversity Areas (CBA 1 & 2) and the site is situated in an ecological support area. A small man-made dams near the project site is NFEPA listed (Figure 23).

f. Fine- scale vegetation description

The list of species noted during the actual field survey appears in Annexure B. A species list from POSA (http://posa.sanbi.org, Grid reference 2727BA of the area was obtained. POSA generated species lists also contain updated Red Data species status according to the Red List of South African Plants published by SANBI in Strelitzia 25 (Raimondo et al. 2009, updated 2013).

1. Terrestrial vegetation and animals

The area's vegetation is dominated by Central Free State Grassland (Gh 6) which is more limited to areas underlain by Karoo sediments and dolerite intrusions. The soils vary from sandy loams on high-lying areas to deep clayey soils in the low-lying areas. No tree are 49 present and the vegetation type is dominated by grasses such as *Aristida congesta, Aristida bipartita, Eragrostis chloromelas, E. curvula, E. superba, Cynodon dactylon, Digitaria eriantha, Elionurus muticus, Heteropogon contortus, Setaria sphacelata, Themeda triandra, and many more, as well as a great wealth of forbs, including Helichrysum dregeanum, Helichrysum rugulosum, Hermannia depressa, Senecio hastatus, Felicia muricata, Nidorella hottentotica, Pollichia campestris and Solanum incanum.*

Table 20: Description of the assessment of the terrestrial vegetation.

Site features	Comments
Landscape features	Extensive plains with seasonal drainage lines. A few pans of varying sizes are scattered in the landscape.
Landuse of the project site	Agricultural area with crop fields, farmsteads roads and railway lines, quarries, borrowpits, dams, etc.
Condition of the vegetation (pristine/degraded/ totally transformed)	Originally the character of this area's vegetation was an extensive grass-covered landscape. It is now in a highly transformed state due to extensive crop farming. The remaining natural grassland is subjected to grazing practices and in some cases it is degraded and invaded by pioneer grasses such as *Aristida congesta*, *Aristida bipartita*, *Hyparrhenia hirta* and others.
Protected plant species noted	No protected plants species were noted on the project site.
Visual indication of and impact on terrestrial fauna (mammals)	The potential diversity of mammals within the study area is low because it is a disturbed area and most natural habitats have been transformed. There are several factors which will reduce the actual number of species present within the project site. The presence of humans and roads, the destruction of natural vegetation, noise etc., has had a major impact on the natural animal populations in the project area. During the site visit the following faunal species were confirmed within the project site: • Dassies (*Procavia capensis*) live amongst the crushed rocks and spoil material in the quarry • Single rodent burrows (most likely Four-striped Grass Mouse (*Rabdomys pumilo*). • Relative large burrows (likely to have been made and utilized by Aardwolf (*Proteles cristatus*), Porcupine (*Hystrix africae-australis*). and/or Aardvark – (*Orycteropus afer*). Smaller burrows were noted and were probably made by Ground squirrel (*Geosciurus inauris*), Yellow Mongoose

	(*Cunictis penicillata*) and Zorilla (*Ictonyx striatus*) None of these species noted within the project site are listed and or protected species.
Visual indication of and impact on terrestrial fauna (herpetofauna)	Of the 23 reptilian species that have been recorded with the region none of these species are listed as Red Data species. Fifteen amphibian species have been recorded within the region and of these 15 species eight species were recorded within close proximity of the project site. One near threatened species namely the Giant Bullfrog (*Pyxicephalus adspersus*) has been recorded for the quarter degree grid square (QDGS). Although this species was not found on site (not a suitable habitat), it is still likely for this species to occur near the project site as potential suitable habitat (pans and drainage lines) is available in the vicinity of the project site.
Visual indication of and impact on terrestrial fauna (birds)	Of the more than 320 bird species that have been recorded in the region a few species occur on the study area. Birds such as African Fish Eagle, Crowned Lapwing, Blacksmith Lapwing, Orange River Francolin, Helmeted Guineafowl, Thick-knee, Northern Black Korhaan, Cattle Egrets, Black-headed Heron, Turtle Doves, Rock Pigeons, and Hadeda and others could occur in the project site. The floor of the quarry is a inundated and a number of waterfowl were noted during the survey. They are Knobbled Coot (breeding), White-faced Duck, Yellow-billed Duck, Egytian Geese, Spoonbill and Dabchick
Signs of pollution	On the stockpile area of the project site are heaps of overburden, crushed dolerite of various sizes but no other signs of pollution were noted.
Erosion potential	There are signs of disturbance and clearance of the vegetation. Although the area is relatively flat, runoff from these disturbed areas and subsequent erosion is possible.
Ecosystem function	Natural vegetation provides nesting areas for avifauna and occasional shelter for terrestrial fauna. Niche habitats for fauna – providing sheltered burrows and nesting sites. Micro-climate is created by the shrubs and trees housing species sensitive to direct sunlight or frost

The following tables present the dominant floral species identified within each HGM type, and terrestrial communities although it should be noted that these lists are not an extensive listing of the floral species found within the project site.

Table 21: Dominant plant species noted on the project site

Trees / shrubs	Grasses/reeds/bulrushes	Forbs
**Eucalyptus camuldulensis*	*Andropogon eucomis*	*Berkheya onopordifolia*
Gomphocarpus fruticosus	*Aristida congesta*	*Berkheya pinnatifida*
Searsia lancea	*Aristida bipartita*	**Bidens bipinnata*
Vachellia karroo	*Bulbostylis burchellii*	*Bulbine narcissifolia*
	Cynodon dactylon	**Chenopodium album*
	Chloris virgata	**Chenopodium schraderianum*
	Digitaria eriantha	*Chrysocoma ciliata*
	Enneapogon cenchroides	**Conyza bonariensis*
	Eragrostis echinochloidea	**Datura ferox*
	Eragrostis superba	*Felicia muricata*
	Eragrostis curvula	**Salsola kali*
	Eragrostis lehmanniana	**Schkuhria pinnata*
	Eragrostis trichophora	*Senecio hastatus*
	Hyparrhenia hirta	**Tagetes minuta*
	Setaria sphacelata	**Verbena aristigera*
	Sporobolus fimbriatus	
	Tragus koelerioides	

2. Conservation status of species

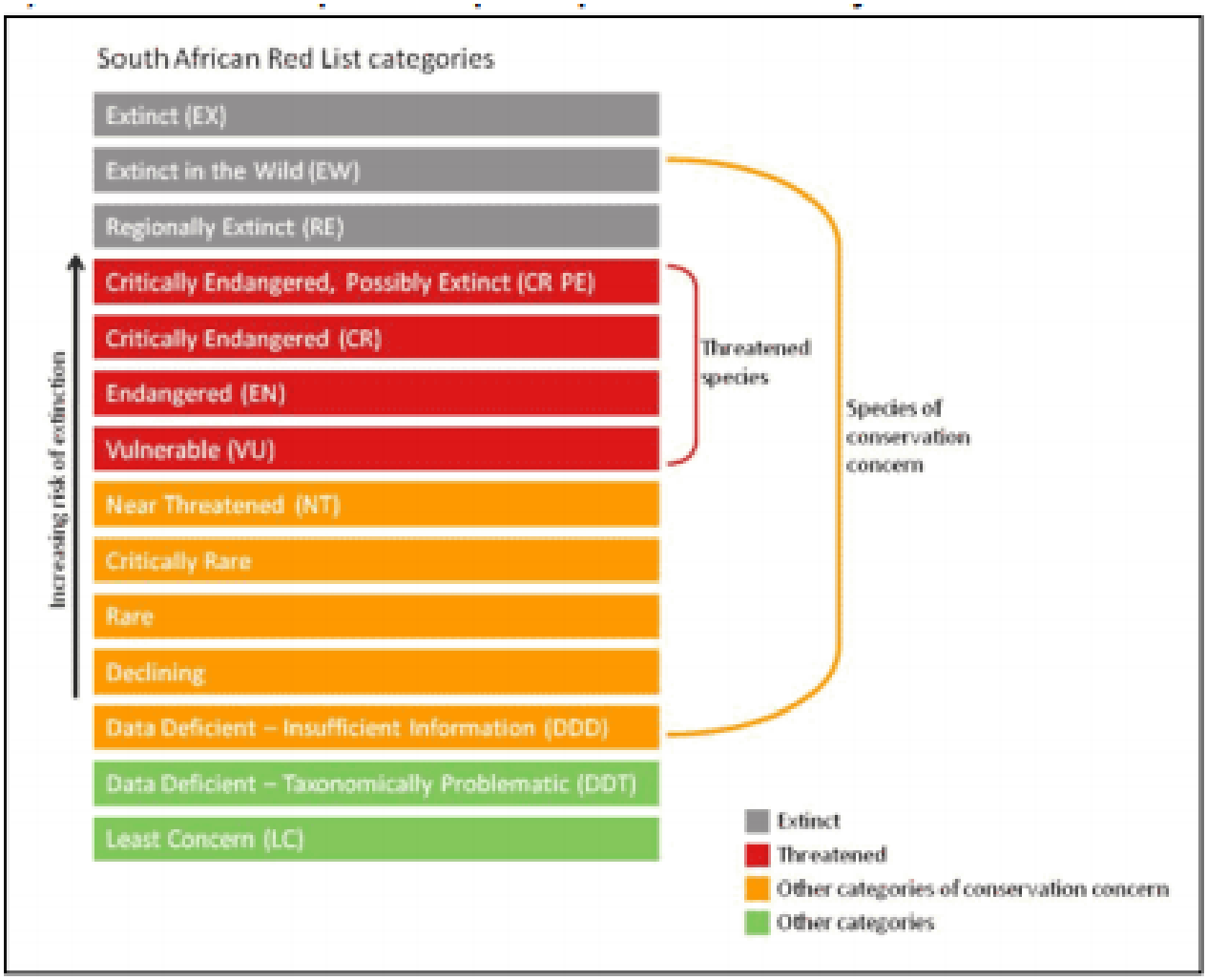


Figure 24: Schematic representation of the South African Red List Categories

3. Alien Invasive Plants (AIPs) confirmed during the survey

Due to the mining and agricultural activities extensive disturbance of the natural vegetation occurred. Several alien species and pioneer species were noted on these disturbed areas. On the project site are Bluegums (*Eucalyptus camuldulensis*), *Tagetes minuta, Bidens bipinnata. Salsola kali, Flaveria bidentis, Schkuhria pinnata, Chenopodium album, Chenopodium schraderianum, and Datura ferox* are present on heaps of overburden and disturbed soil.

4. Riparian and wetland system characterisation

The following tables present the dominant floral species identified within each HGM type although it should be noted that these lists are not an extensive listing of the floral species found within the project site.

Table 22: Dominant plan species noted within the riparian zone on the quarry floor.

Aquatic plants	Grasses/reeds/bulrushes	Forbs
Potamogeton crispus	*Chloris virgata*	**Achyranthes aspera*
	Cynodon dactylon	**Bidens bipinnata*
	Echinochloa holubii	**Tagetes minuta*
	Phragmites autralis	**Verbena bonariensis*
	Typha capensis	**Verbena braziliensis*
	Gomphocarpus fruticosus	** Xanthium strumarium*

Table 23: Dominant plan species noted within the riparian zone on the quarry floor.

Trees / shrubs	Grasses/reeds/bulrushes	Forbs
Asparagus laricinus	*Cyperus longus*	
Gomphocarpus fruticosus	*Cyperus margaritsaceus*	**Bidens bipinnata*
Lycium cinereum	*Echinochloa holubii*	*Chenopodium album*
	Eragrostis plana	*Chenopodium schraderianum*
	Eragrostis micrantha	**Datura ferox*
	Eragrostis trichophora	**Schkuhria pinnata*
	Kyllinga erecta	**Tagetes minuta*
	Setaria sphacelata	**Verbena bonariensis*
	Setaria pumilum	**Verbena braziliensis*
	Setaria nigrirostris	** Xanthium strumarium*
	Sporobolus fimbriatus	

1. *Plant Species Plan*

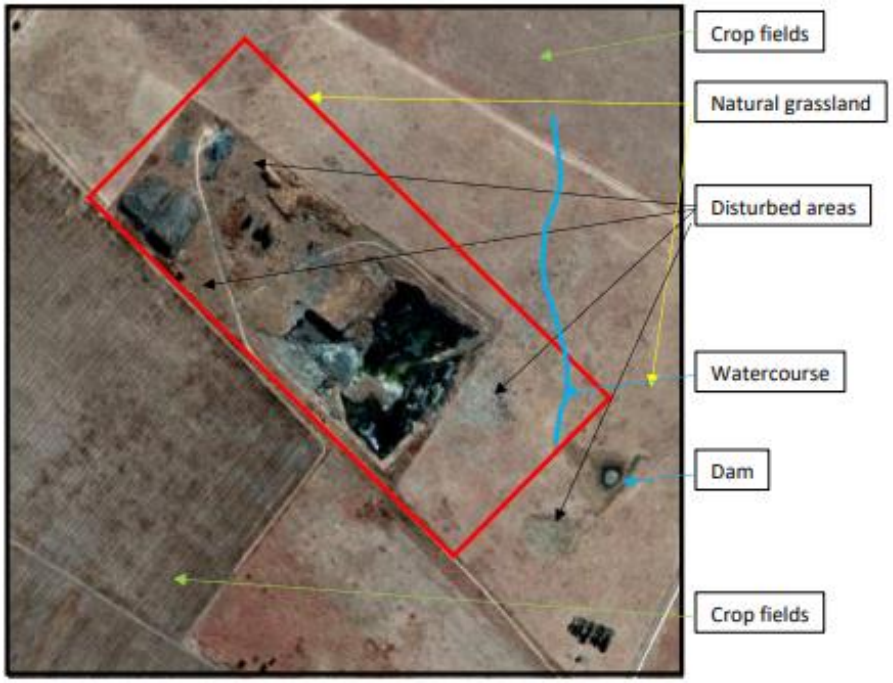


Figure 25: Satellite image of the project site (red polygon) and the various major plant communities on the project site (Preez, July 2018)

Species lists of the natural plant communities:

Dominant plant species noted within the riparian zone on the quarry floor.

Table 24: Natural Plant Communities * indicates exotic species

Aquatic plants	Grasses/reeds/bulrushes	Forbs
Potamogeton crispus	*Chloris virgata*	**Achyranthes aspera*
	Cynodon dactylon	**Bidens bipinnata*
	Echinochloa holubii	**Tagetes minuta*
	Phragmites autralis	**Verbena bonariensis*
	Typha capensis	**Verbena braziliensis*
	Gomphocarpus fruticosus	** Xanthium strumarium*

Table 25: Dominant plant species noted within the riparian zone of the watercourse * indicates exotic species

Trees / shrubs	Grasses/reeds/bulrushes	Forbs
Asparagus laricinus	*Cyperus longus*	
Gomphocarpus fruticosus	*Cyperus margaritaceus*	**Bidens bipinnata*
Lycium cinereum	*Echinochloa holubii*	*Chenopodium album*
	Eragrostis plana	*Chenopodium schraderianum*
	Eragrostis micrantha	**Datura ferox*
	Eragrostis trichophora	**Schkuhria pinnata*
	Kyllinga erecta	**Tagetes minuta*
	Setaria sphacelata	**Verbena bonariensis*
	Setaria pumilum	**Verbena braziliensis*
	Setaria nigrirostris	** Xanthium strumarium*
	Sporobolus fimbriatus	

Table 26: Grassland Communities * indicates exotic species

Trees / shrubs	Grasses/reeds/bulrushes	Forbs
**Eucalyptus camuldulensis*	*Andropogon eucomis*	*Berkheya onopordifolia*
Gomphocarpus fruticosus	*Aristida congesta*	*Berkheya pinnatifida*
Searsia lancea	*Aristida bipartita*	**Bidens bipinnata*
Vachellia karroo	*Bulbostylis burchellii*	*Bulbine narcissifolia*
	Cynodon dactylon	**Chenopodium album*
	Chloris virgata	**Chenopodium schraderianum*
	Digitaria eriantha	*Chrysocoma ciliata*
	Enneapogon cenchroides	**Conyza bonariensis*
	Eragrostis echinochloidea	**Datura ferox*
	Eragrostis superba	*Felicia muricata*
	Eragrostis curvula	**Salsola kali*
	Eragrostis lehmanniana	**Schkuhria pinnata*
	Eragrostis trichophora	*Senecio hastatus*
	Hyparrhenia hirta	**Tagetes minuta*
	Setaria sphacelata	**Verbena aristigera*
	Sporobolus fimbriatus	
	Tragus koelerioides	

Table 27: Alien Invasive species noted on the project site

Alien invasive species noted on the project site

Nr	Scientific name of species
1	*Bidens bipinnata*
2	*Chenopodium album*
3	*Chenopodium schraderianum*
4	*Cirsium vulgare*
5	*Conyza bonariense*
6	*Cuscuta campestris*
7	*Cyclospermum leptophyllum*
8	*Datura ferox*
9	*Datura stramonium*
10	*Plantago maior*
11	*Rumex crispus*
12	*Salsola kali*
13	*Schkuhria pinnata,*
14	*Tagetes minuta*
15	*Verbena bonariense*
16	*Verbena braziliense*
17	*Xanthium stramonium*

i. Fauna

No animals where spotted during the site inspection. Animals that may occur in the area will be very similar to those found around Koppies. The area was previously disturbed for the recovery of gravel. Small mammals, reptiles and insects will occur in the area.

The fauna at the site will not be impacted by the proposed mining activity as they will be able to move away or through the site, without being harmed. Workers should be educated and managed to ensure that no fauna at the site is harmed.

ii. Air Quality

The background air quality of the surrounding area is highly impacted on by vehicles travelling along the N1. Given the surrounding extent of mostly covered vegetated areas, no extreme dust generation under windy conditions is experienced.

Emission into the atmosphere is controlled by the National Management: Air Quality Act, 2004. The proposed activity at the site will however not trigger an application in terms of the Air Quality Act as the emissions to be produced at the mining site will only entail dust generation due to the disturbance of soil. Dust will be generated by the movement of earthmoving equipment, the loading of material and transporting of material from site.

The trucks driving on site has to comply with the speed limit and since the material is coarse and heavy, minimal dust is generated during the transportation of material from the quarry. Loads will be flattened to ensure that minimal spillage of the material takes place during transportation. Topsoil stockpiles will be planted with indigenous grass species to ensure that exposed surface areas are minimised, reducing windblown dust from the site. The vegetation will also assist in capturing wind born dust and minimising the spread of dust from the site.

Dust generation on the access and haul roads as well as mechanical excavation can be managed through the implementation of dust suppression measures via water carts and a sprinkler system. The applicant has to conduct formal dust monitoring on site to provide management with an effective management tool for mitigating the impact of the mining activity on the surrounding environment with regard to dust pollution.

iii. Noise

The background noise level of the surrounding area is highly impacted on by traffic travelling along the N1 road passing the property. Due to the nature of the proposed activity, noise will be generated as a result of mechanical excavation including activities such as drilling.

There are no influences on noise levels from industrial or other mining operation in the area. The noise generated from the mining machinery will be similar to noise generated along the N1 by public vehicles except after hours when the absence of surrounding activity and agricultural operations may exacerbate the presence of noise. Blasting noise will be instantaneous and of short duration. This will only occur once every two to three weeks. Loading and transportation of the material will generate noise daily. The significance of noise on the surrounding environment is therefore deemed to be of low significance. Mitigation measures should be implemented to ensure employees conduct them in an acceptable manner while on site in order to lessen the noise impact of the proposed activity on the surrounding environment. The nuisance value of noise generated by heavy earthmoving equipment for residence in the near vicinity is deemed to be of low – medium significance, as the mine is expected to be operational 24 hours a day for 6 days a week. All mining vehicles will also be equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996 (Act No 93. of 1996).

iv. Archaeological and Cultural Interest

HCAC was appointed to conduct a Heritage Impact Assessment for a proposed mining right application for the expansion of an existing quarry, Please refer to Appendix 14 for the specialist report. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the mining right footprint. Impacts from mining activities relating to the existing quarry occurred from the 1990's onwards, in addition the surrounding area was cultivated. These activities would have impacted on surface indicators of heritage sites and no archaeological sites or artefacts of significance were recorded during the survey. In terms of the palaeontological component the area is indicated as of insignificant sensitivity on the SAHRIS paleontological map and no further studies are required in this regard.

No further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed. In terms of the built environment of the area (Section 34), no structures older than 60 years occur in the study area. In terms of Section 36 of the Act no burial sites were recorded, however one stone cairn of unknown age and purpose was recorded. The cairn is possibly the result of clearing the fields for agricultural purposes but, although unlikely, the cairn could indicate an informal grave (Figure 26). No public monuments are located within or close to the study area. The study area is characterised by an existing quarry and associated infrastructure and the proposed development will not impact negatively on significant cultural landscapes or views capes. During the public participation process conducted for the project no heritage concerns was raised (HCAC, 2018).

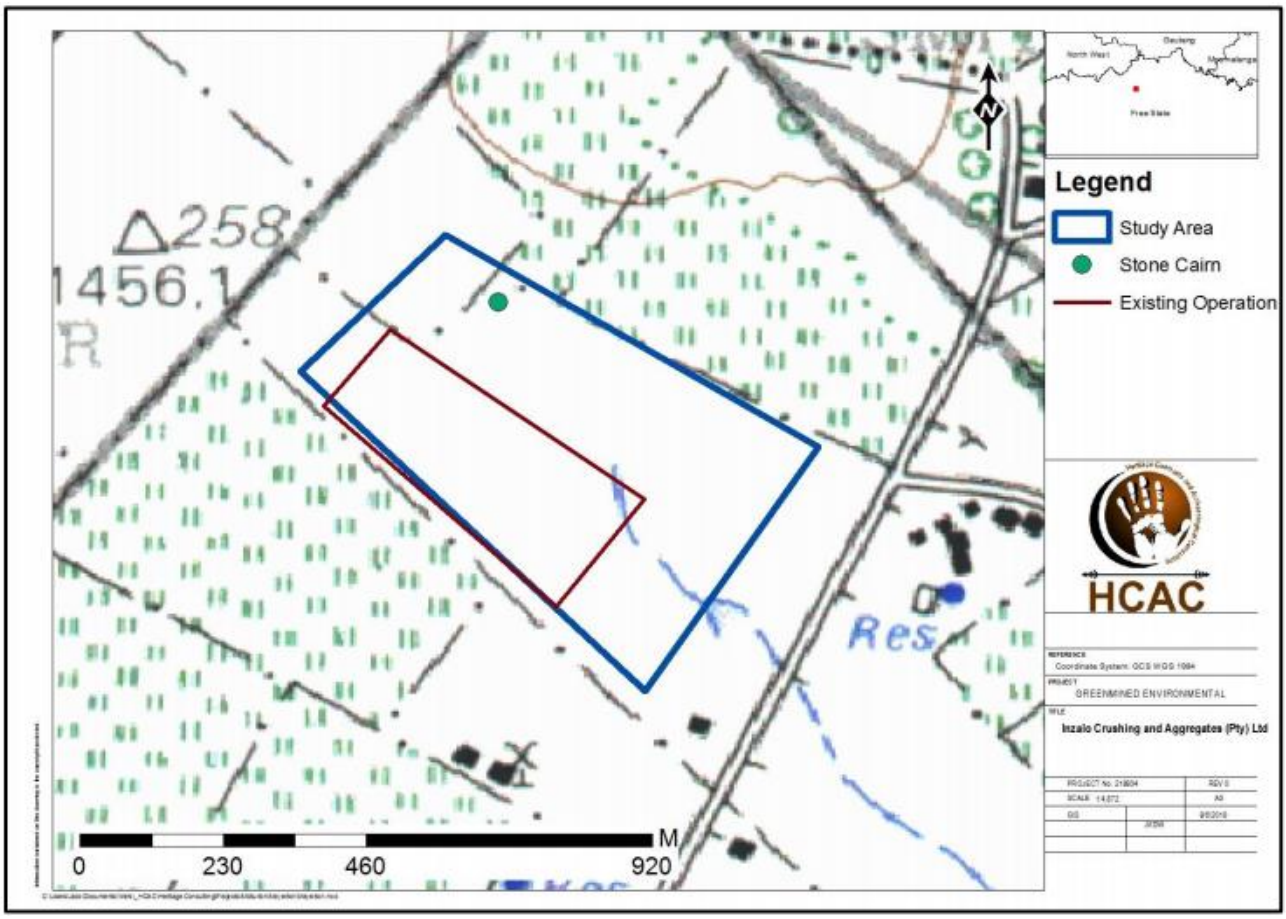


Figure 26: Identified stone Cairn in the study area

In terms of Section 36 of the Act no graves were identified, however a stone cairn of unknown purpose was identified at 27.5604530051 -27.0492369588. The stone cairn measures approximately 1.2 meter in diameter and is not easily recognisable as it is overgrown with knee-high grass. It's unlikely that the cairn represents a grave and it is most likely a result of clearing fields for agricultural purposes. The area must be avoided until it can be proven that the cairn does not represent a grave.

The impact on heritage resources in the study area can be mitigated to an acceptable level and it is recommended that the proposed project can commence on the condition that the recommendations in this report are implemented as part of the EMPr and based on approval from SAHRA. Furthermore, the socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project (HCAC, 2018).

Final comment received from SAHRA (13 September 2018):

The author found no evidence of archaeological sites or artefacts of significance, structures older than 60 years, public monuments or burial sites; however, one stone cairn may, although unlikely, indicate an informal grave. The proposed area is indicated as of insignificant palaeontological sensitivity on the SAHRIS paleontological map. The impact on heritage resources is therefore considered low.
The following recommendations are to be implemented as part of the EMPr:

- The stone cairn that may indicate a grave is to be preserved in-situ with a 20 meter buffer zone. If this is not possible, it must be proven that it is not a grave in which case no further actions are required.
- If any graves are located in future they should ideally be preserved in-situ or alternatively relocated according to existing legislation.
- Implementation of a chance find procedure.

v. Visual Exposure

Due to the current mining disturbance nearby the area the site has a low aesthetic value. The proposed mining area will visible from N1 passing the property and will therefore have a visual impact on the immediate surrounding area.

The applicant should ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the stockpile area. Upon closure of the mining area and decommissioning of the site, the area should be fully rehabilitated and all exposed areas should be seeded to enhance vegetation recovery should natural vegetation not establish within six months of completion of rehabilitation.

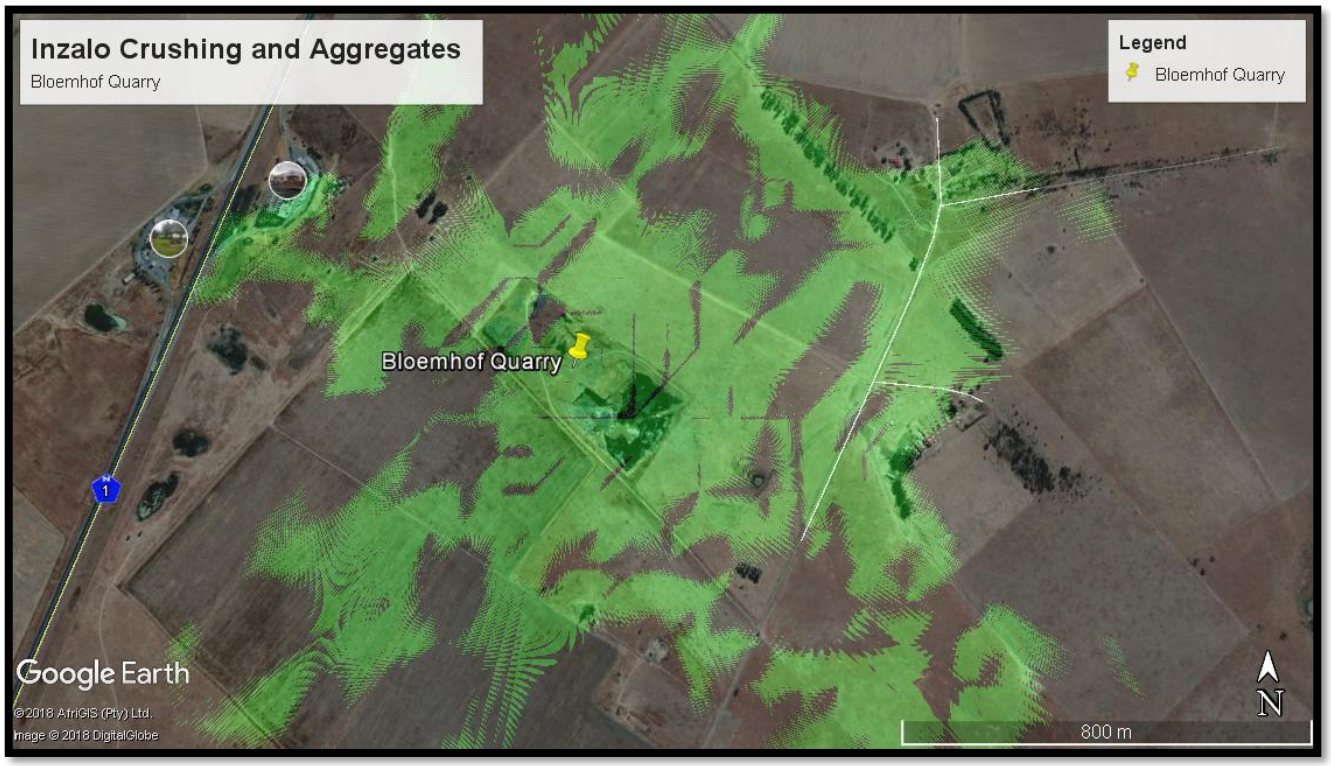


Figure 27: View shed of the proposed Bloemhof Quarry

From Figure 27, the areas in green indicates the areas that will be able to see the mining area. Areas not indicated in green will not be able to see the mining area.

vi. Socio- Economic

The Free State Province is situated between the Orange and Vaal Rivers. Bloemfontein is the capital city. It is a province of great contrasts from Highveld Grassland and Kalahari Sandveld country to majestic mountains, wilderness areas and farming land. The Free State Province is a strongly rural province. The provincial government's growth strategy is focused on addressing infrastructure backlogs, poverty alleviation and social development. The Free State is the third-largest province in South Africa. However, it has the second-smallest population and the second-lowest population density.

The province is favourably situated for economic co-operation with other parts of southern Africa as it shares a border with Lesotho. The Free State Province is divided into five District Municipalities and these are: -

- The Xhariep District
- The Motheo District
- The Lejweleputswa District
- The Thabu Mofutsanyane District
- The Fezile Dabi District

This district is an important agricultural production area, particularly for maize, and is known as the grain basket of South Africa. The Vaal Dam is the main source of water for Gauteng, and offers a wide profile of sport and leisure facilities. The district also has other attractions such as the Vredefort Dome, which is the third largest meteorite site in the world (200 km in diameter), and various San paintings. The most important towns are Sasolburg and Kroonstad. Sasolburg has significant strategic importance for South Africa, as it is the location of large chemical and synthetic fuel plants (i.e. the Sasol plant). Kroonstad is an important agricultural and administrative centre in the district. Fezile Dabi District Municipality (DC20) is situated within the northern portion of Free State Province. The District Municipality borders Mpumalanga Province in the east, North-West Province in the west and Gauteng Province in the north. Commercial agriculture is an integral part of this part of the province, and cattle ranching and maize farming are very popular. Various chemical industries such as SASOL and its associated industries are found in this region.

The provinces largest coal mines are also found in this district. Ngwanthe Local Municipality (FS203) is situated in the northern part of the Fezile Dabi District Municipality previously known as the Northern Free State, it is one of the four Local municipality within the district, the other three (3) being Moqhaka LM, Metsimaholo LM and Mafube LM.

The total estimated population of the municipality in terms of Census 2011 results is 120 520. The geographical area of the province is 21301.006 square kilometres. The municipality comprises of five towns which are: Parys (Head Office), Heilbron, Koppies, Vredefort, and Edenville. Ngwanthe Local Municipality is a category B municipality as envisaged in section 155 (h) of the Constitution of the Republic of South Africa Act No. 108 of 1996, as such it has specific legislative powers and performs such duties and functions which are attributable to the local municipality of its category by the Constitution. In terms of the provincial gazette, Ngwanthe is supposed to be a Mayoral type municipality.

Inzalo Bloemhof operation is located within Ward 8 of the Ngwanthe Local Municipality.

1. *Education and Employment*

The District Municipality is also faced with the high levels of illiteracy and innumeracy. Census 2001 indicates that 13.77% of the population haven't had any schooling. Only 6.32% have higher education. These low levels of education are experienced within the female population. This is translated into 40.37% of the available workforce being economically inactive, 35% being employed and 24.58% being unemployed.

Most of the males have employment in craft and related trades industries, as machine operators and assemblers and in elementary occupations. Almost all the women have employment in elementary occupations.

Table 28: Education levels in Ngwanthe LM

	1996		2001		2011	
	Male	Female	Male	Female	Male	Female
No schooling	4680	6247	5066	6839	2657	3531
Some primary	7132	8709	7250	8783	5820	7910
Completed primary	2356	3019	2259	2812	1696	2172
Some secondary	10083	11779	9617	11385	11780	13338
Greade 12 / Std 10	3780	4153	5329	5803	9148	9586
Higher	1699	1698	1763	1877	2202	2440

Source: STATSSA, Census 1996, 2001 and 2011

Table 29: Employment status in Ngwanthe LM

	Employed	Unemployed	Unemployment rate
1996	26313	13335	33.6
2001	22064	19643	47.1
2011	25376	13814	35.0

Source: STATSSA, Census 1996, 2001 and 2011

The unemployment rate in the municipality was high in 2011 at 35%. Though it was high in 2011 there was an improvement from the highest unemployment rate experienced in 2001 whereby almost halve of the labour force was unemployed. The 2016 household survey does not show the unemployment status and therefore we rely on the 2011 statistics

2. *Economic Profile*

Within the Fezile Dabi District, the most important mining town is Sasolburg. Mining and Chemical industries are the primary economic activities in the region and as such, is the largest contributor to the Province's GDP. A far greater portion of the land is used for agriculture.

3. *Population Density, Growth and Location*

According to Census 2011, the Fezile Dabi District Municipality has a population of 460 276 with 75.4% being in rural areas.

Table 30: and population growth rates by the Fezile Dabi District Municipality.

Municipality	1996	2001	Growth Rate (1996-2001)	2011	Growth Rate (2001-2011)
Ngwathe	120 007	118 810	-0.2	120 520	0.1

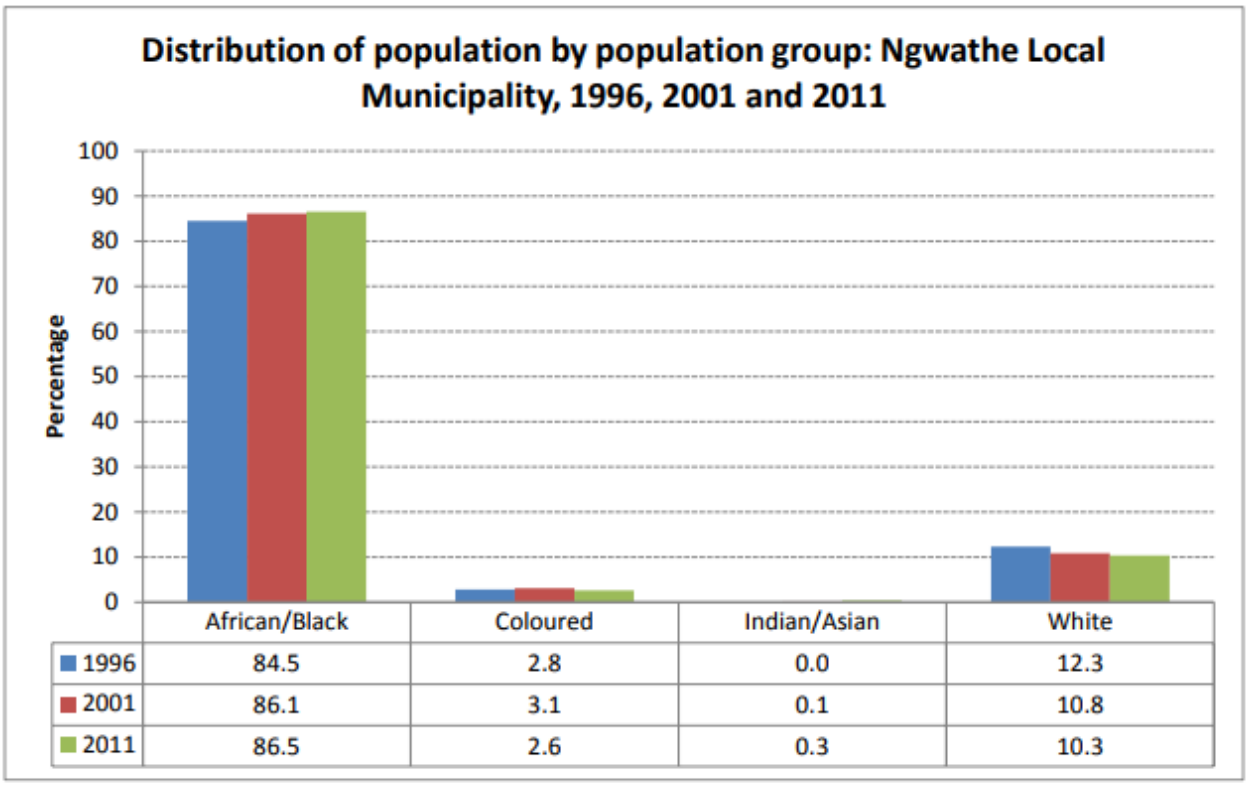
Source: STATSSA, Census 1996, 2001 and 2011

It is indicated from the table below that Ngwanthe Municipality is experience a negative growth in population.

Table 31: Statistics for 2016.

	Black african			Coloured			Indian/asian			White			Total		
Ngwathe Local Municipality	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
FS203: Ngwathe	50027	54480	104507	1502	1537	3039	61	-	61	4834	6465	11299	56425	62482	118907

Population figures according to race:



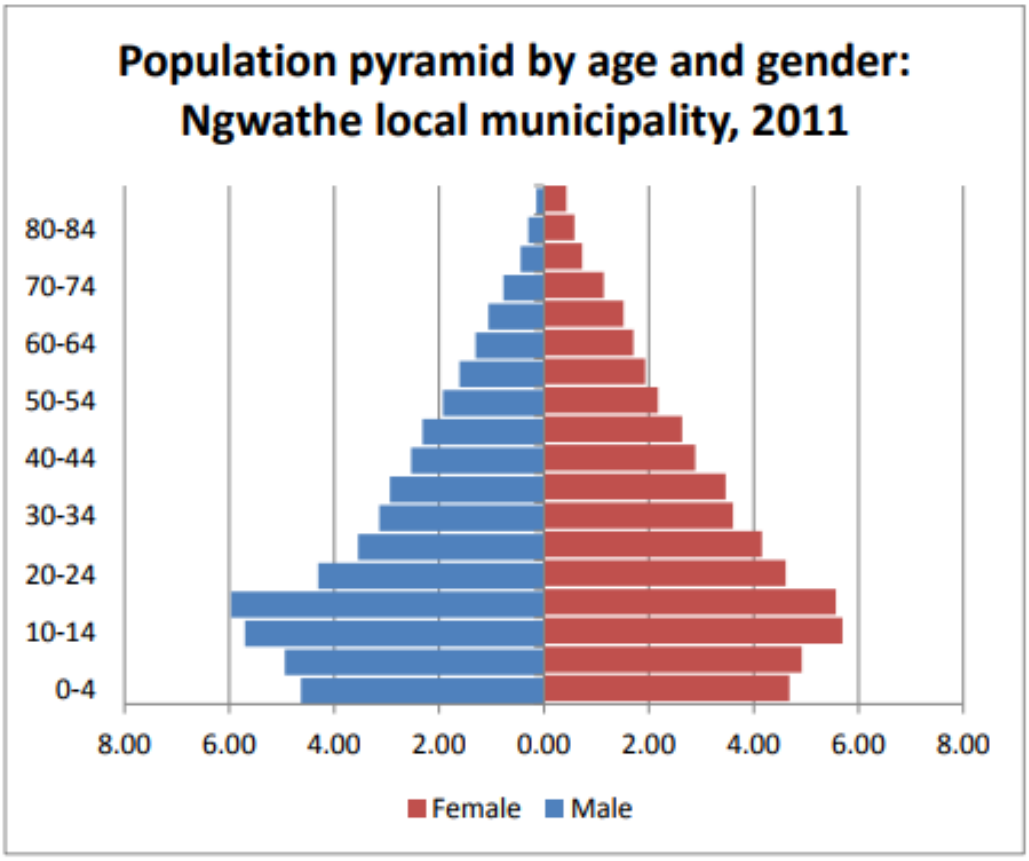
	African/Black	Coloured	Indian/Asian	White
1996	84.5	2.8	0.0	12.3
2001	86.1	3.1	0.1	10.8
2011	86.5	2.6	0.3	10.3

Source: STATSSA, Census 1996, 2001 and 2011

Figure 28: Distribution by race.

The figure above indicates that the municipality consists of the large number of Black African population followed by whites then coloureds. Though the Indian population is the smallest it has been growing from less than 0.1% in 1996 to 0.3% in 2011.

The gender breakdown is as follows (2011 Census) Gender People Percentage Female 1416623 51.60% Male 1328967 48.40% for the Free State Province.



Source: STATSSA, Census 2011

Figure 29: Population pyramid by age and gender.

Population pyramid for 2011 shows a bulge at the lower levels age groups 10- 19 years old. This shows that the municipality consist of the young population who still needs to go to school and enter the labour market in few years. It also shows that the older population 60 years and above lives longer. Females seem to be out living the males as shown in the pyramid that on the female side for older population it is wider than the male side.

Of the total population, 68% speak Sesotho and 13.56% speak Afrikaans. Black Africans make up 85.71% of the population and Whites constitute only 12.19%.

4. Housing

Dwelling statistics indicate that 70% of the population lives in houses or some form of brick structure. Only 17% live in informal settlements.

5. *Social Infrastructure*

Telephones and selected household goods

About 42% of the population has access to a public telephone nearby. Land based and cellular telephones are available to 38% of the regional population. Radio seems to be the most popular medium used followed by television. Toilets Census 2001 shows that 11% of the population uses pit latrines without ventilation and 62% having flushing toilets.

6. Refuse removal

The refuse removal statistics support the toilet statistics in that 62 percent of the population have weekly refuse removal and 20% of the population have their own refuse dump.

7. *Water and Power Supply*

Electricity and gas are the most common forms of energy used for heating and cooking purposes. 80% of the population have access to electricity whilst 17% uses candles for lighting. About 15% of the population has piped water in their dwellings. About 90% of the regional population has access to piped water.

(b) Description of the current land uses.

The remaining extent of the farm Bloemhof 14, Parys, Free State Province is situated in an agricultural and mining setting to the east of the R723. The land use of the property comprises of the following:

- Agriculture – Mainly grazing
- Mining – Signs of previous mining activities for aggregate is evident on the farm.

The land use of the surrounding properties comprises of the following:

- Industrial – NONE
- Residents – Residents are situated 0.5 km east of the mining site
- Transport – Unnamed public road is located 450 m from the proposed quarry, that is connecting to the R723 (±1.7 km away)
- Transport N1 is located 850 m west from the proposed site
- Commercial Kroonvaal Engen One Stop 650 m west of the site

- Agriculture – Grazing

(c) Description of specific environmental features and infrastructure on the site.

The proposed mining area is approximately 25.4ha is extent and the applicant, Inzalo Crushing and Aggregates (Pty) Ltd, intents to win material from the area for at least 20 years. The aggregate / stone gravel to be removed from the quarry will be used for road construction in the vicinity. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure in and around the Koppies / Parys area.

The existing infrastructure within 500 m of the proposed mining area is the Gravel Access Road, N1, Kroonvaal Engen One Stop and an existing quarry pit. The provincial road (R723) is approximately 1.7 from the proposed mining area.

B&E International (Pty) Ltd obtained a mining permit for the existing quarry area in 2012 with permit no 07/2012 and Mining Permit Reference Number FS 30/5/1/3/2/10001MP on the 13th of August 2012. The permit has been renewed for its 3rd renewal period on 10th November 2017 which expired on the 9th of November 2018. B&E International only commenced with the mining activities in August 2018, and therefore Inzalo Crushing and Aggregates applied for a Mining Right on 15 May 2018 in order for the Mining Right to be approved by the time that the mining permit (10001MP) expires and B&E International (the contractor for Inzalo Crushing and Aggregates) can continue with the quarrying process. The 300 days ended on the 21st of April 2019. The mining infrastructure that will be used under the Mining Permit, will be the same infrastructure to be used during the mining right. Therefore, the mining equipment currently located on site, is to remain until the right has been granted. The decision in the infrastructure to remain until the mining right was made due to the fact that it is a costly process to remove the infrastructure from site, for such a short period. Therefore, Inzalo Crushing and Aggregates and B&E International has made the decision to keep the infrastructure on site as is should the right not get approved, the site will have to be fully rehabilitated by the contractor.

The impact of the proposed mining area on the infrastructural features of the surrounding area is deemed to be of low significance as the impact of the mining activity will be concentrated within the 25.4ha footprint area of the mine.

In order to mitigate the potential impact on the surface or ground water. Storm water management will be implemented on-site. Storm water will be channelled around the mining area to prevent possible contamination of clean water flowing over dirty areas. If this is implemented the proposed activity is not expected to have a negative effect on the surface or ground water in the vicinity.

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

The environmental and current land use map is attached as Appendix 3.

iv) Impacts and risks identified including the nature, significance consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

The following potential impacts were identified of each main activity in each phase. The significance rating was determined using the methodology as explained under *vi) Methodology Used in Determining and Ranking the Significance*.

The impact rating listed below was determined for each impact **prior** to bringing the proposed mitigation measures into consideration. The degree of mitigation indicates the possibility of partial, full or no mitigation of the identified impact.

Table 32: Impact Assessment for Inzalo –Bloemhof Quarry prior to mitigation measures

Nature of Impact	Impact	Positive/Negative/ Neutral	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
CONSTRUCTION / SITE ESTABLISHMENT PHASE												
ACTIVITY:	**DEMARCATION OF SITE WITH VISIBLE BEACONS.**											
	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	Neg										Low
ACTIVITY:	**ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.**											
	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	Neg										Low
Social & Safety	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Neg	Reversible	1	3	5	3	3	5	4	12	Med
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Medium - High
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	2	4	2,3	3	5	4	9,333	Low-Med
Topography	Alteration of topography	Neg	Irreversible	1	2	5	2,7	2	5	3,5	9,333	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1,7	3	5	4	6,667	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	3	5	3	4	5	4,5	13,5	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	2	2	4	2,7	3	5	4	10,67	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
SUB ACTIVITY: ABLUTION FACILITIES												
Groundwater	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	2	3	5	3,3	3	5	4	13,33	Med

Nature of Impact	Impact	Positive/Negative/ Neutral	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface water	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	2	3	5	3,3	3	5	4	13,33	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Soils	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	1	3	5	3	3	5	4	12	Med
SUB ACTIVITY: ACCESS ROADS												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
SUB ACTIVITY: SITE OFFICES												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
SUB ACTIVITY: VEHICLE SERVICE AREA												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium

Nature of Impact	Impact	Positive/Negative/ Neutral	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
SUB ACTIVITY: WASH BAY												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
SUB ACTIVITY: WORKSHOP												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	2	4	2,3	3	5	4	9,333	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
SUB ACTIVITY: SALVAGE YARD												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med

Nature of Impact	Impact	Positive/Negative/ Neutral	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
SUB ACTIVITY: BUNDED DIESEL AND OIL STORAGE FACILITIES												
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
SUB ACTIVITY: GENERATOR AREA (BUNDED)												
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
SUB ACTIVITY: WEIGH BRIDGE												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med

Nature of Impact	Impact	Positive/Negative/ Neutral	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
	Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.											
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
SUB ACTIVITY: PARKING AREA												
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
SUB ACTIVITY: WASTE AREA												
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	2	2	4	2,7	3	5	4	10,67	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
ACTIVITY:	**STRIPPING AND STOCKPILING OF TOPSOIL**											
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Medium - High
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med

Nature of Impact	Impact	Positive/Negative/ Neutral	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	2	4	2,3	3	5	4	9,333	Low-Med
Topography	Alteration of topography	Neg	Irreversible	1	2	5	2,7	2	5	3,5	9,333	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1,7	3	5	4	6,667	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	3	5	3	4	5	4,5	13,5	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	2	4	2,3	5	5	5	11,67	Medium
Air quality	Dust generation	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Medium
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	2	2	4	2,7	3	5	4	10,67	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	3	3	4	3,3	2	1	1,5	5	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	3	2,7	3	5	4	10,67	Med
OPERATIONAL PHASE												
ACTIVITY:	**DRILLING AND BLASTING**											
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Noise	Noise nuisance generated by drilling equipment and blasting	Neg	Reversible	2	2	1	1,7	1	3	2	3,333	Low
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	3	4	5	4	5	5	5	20	High
Topography	Alteration of topography	Neg	Irreversible	1	2	5	2,7	2	5	3,5	9,333	Low-Med
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	5	5	15	Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1,7	3	5	4	6,667	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	3	5	3	4	5	4,5	13,5	Med
Noise	Noise nuisance generated by drilling equipment and blasting	Neg	Reversible	2	2	1	1,7	1	3	2	3,333	Low
Air quality	Dust generation	Neg	Reversible	1	2	1	1,3	1	3	2	2,667	Low
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	2	2	4	2,7	3	5	4	10,67	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	1	2	1,7	2	5	3,5	5,833	Low-Med
Wetlands and Pans	Impact on the water quality. Changes to the hydrological regime of the stream	Neg	Reversible	5	5	5	5	5	5	5	25	High
Wetlands and Pans	Loss of riparian vegetation, aquatic habitat and stream continuity (migration corridors)	Neg	Reversible	4	4	4	4	5	5	5	20	High
ACTIVITY:	**EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED**											
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	2	2	4	2,7	3	5	4	10,67	Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	1	3	5	3	4	5	4,5	13,5	Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	1	2	1,7	2	5	3,5	5,833	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	2	2,3	2	5	3,5	8,167	Low-Med
ACTIVITY:	**CRUSHING AND SCREENING OF AGGREGATES**											
Noise	Noise nuisance caused by crushing plant.	Neg	Reversible	2	2	4	2,7	4	5	4,5	12	Med
Hazardous Waste	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Air quality	Dust generation	Neg	Reversible	2	2	1	1,7	2	5	3,5	5,833	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	1	1,7	2	5	3,5	5,833	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna.	Neg	Reversible	2	2	4	2,7	3	5	4	10,67	Med

Nature of Impact	Impact	Positive/Negative/ Neutral	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
	Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.											
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	1	2	1,7	2	5	3,5	5,833	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	2	2,3	2	5	3,5	8,167	Low-Med
ACTIVITY:	**STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS**											
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Hazardous Waste	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by vehicles	Neg	Reversible	2	2	4	2,7	3	2	2,5	6,667	Low-Med
Air quality	Dust generation	Neg	Reversible	2	2	1	1,7	2	5	3,5	5,833	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	1	1,7	2	5	3,5	5,833	Low-Med
Traffic and Safety	Road degradation. Increased potential for road incidences Potential distraction to road users	Neg	Reversible	2	2	4	2,7	3	2	2,5	6,667	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	1	2	1,7	2	5	3,5	5,833	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	2	2,3	2	5	3,5	8,167	Low-Med
DECOMMISSIONING PHASE												
ACTIVITY:	**SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**											
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Soils	Soils replaced and ameliorated	Pos	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	1	4	2	2,3	2	5	3,5	8,167	Low-Med
Topography	Alteration of topography	Neg	Irreversible	1	2	5	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Topography	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Pos	Irreversible	1	2	5	2,7	2	5	3,5	9,333	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1,7	3	5	4	6,667	Low-Med
Visual aspect	Improved aesthetics through rehabilitation	Pos	Reversible	2	1	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery	Neg	Reversible	2	2	4	2,7	4	3	3,5	9,333	Low-Med
Air quality	Dust nuisance caused during landscaping activities	Neg	Reversible	2	2	1	1,7	2	5	3,5	5,833	Low-Med
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	2	2	1	1,7	2	5	3,5	5,833	Low-Med
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	2	2	4	2,7	3	5	4	10,67	Med
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	2	1	3	2	1	5	3	6	Low-Med
Social & Safety	Health and safety risk posed by un-sloped areas	Neg	Reversible	1	3	4	2,7	3	3	3	8	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	2	1	2	1,7	2	5	3,5	5,833	Low-Med
Surface water	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Pos	Reversible	2	3	2	2,3	2	5	3,5	8,167	Low-Med
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	1	3	4	2,7	3	5	4	10,67	Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	2	3	2	2,3	2	5	3,5	8,167	Low-Med
Groundwater	Improve response to issues relating to deterioration of groundwater quality or quantity	Pos	Reversible	2	1	2	1,7	2	5	3,5	5,833	Low-Med
ACTIVITY: Application for Closure Certificate												

v) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

Methodology for the assessment of the potential environmental, social and cultural impacts

DEFINITIONS AND CONCEPTS:

Environmental significance:

The concept of significance is at the core of impact identification, evaluation and decision-making. The concept remains largely undefined and there is no international consensus on a single definition. The following common elements are recognised from the various interpretations:

- Environmental significance is a value judgment,
- The degree of environmental significance depends on the nature of the impact,
- The importance is rated in terms of both biophysical and socio-economic values, and
- Determining significance involves the amount of change to the environment perceived to be acceptable to affected communities.

Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of acceptability) (DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5).

The concept of risk has two dimensions, namely the consequence of an event or set of circumstances, and the likelihood of particular consequences being realised (Environment Australia (1999) Environmental Risk Management).

Impact

The positive or negative effects on human well-being and / or the environment.

Consequence

The intermediate or final outcome of an event or situation OR it is the result, on the environment, of an event.

Likelihood

A qualitative term covering both probability and frequency.

Frequency

The number of occurrences of a defined event in a given time or rate.

Probability

The likelihood of a specific outcome measured by the ratio of a specific outcome to the total number of possible outcomes.

Environment

Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation (ISO 14004, 1996).

Methodology that will be used

The environmental significance assessment methodology is based on the following determination:

Environmental Significance = Overall Consequence x Overall Likelihood

Determination of Overall Consequence

Consequence analysis is a mixture of quantitative and qualitative information and the outcome can be positive or negative. Several factors can be used to determine consequence. For the purpose of determining the environmental significance in terms of consequence, the following factors were chosen: ***Severity/Intensity, Duration and Extent/Spatial Scale***. Each factor is assigned a rating of 1 to 5, as described in the tables below.

Determination of Severity / Intensity

Severity relates to the nature of the event, aspect or impact to the environment and describes how severe the aspects impact on the biophysical and socio-economic environment.

Table 1 will be used to obtain an overall rating for severity, taking into consideration the various criteria.

Table 33: Rating of Severity

Type of criteria	Rating				
	1	2	3	4	5
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%
Qualitative	Insignificant / Non-harmful	Small / Potentially harmful	Significant/ Harmful	Great/ Very harmful	Disastrous Extremely harmful
Social/ Community response	Acceptable / I&AP satisfied	Slightly tolerable / Possible objections	Intolerable/ Sporadic complaints	Unacceptable / Widespread complaints	Totally unacceptable / Possible legal action
Irreversibility	Very low cost to mitigate/ High potential to mitigate impacts to level of insignificance/ Easily reversible	Low cost to mitigate	Substantial cost to mitigate/ Potential to mitigate impacts/ Potential to reverse impact	High cost to mitigate	Prohibitive cost to mitigate/ Little or no mechanism to mitigate impact Irreversible
Biophysical (Air quality, water quantity and quality, waste production, fauna and flora)	Insignificant change / deterioration or disturbance	Moderate change / deterioration or disturbance	Significant change / deterioration or disturbance	Very significant change / deterioration or disturbance	Disastrous change / deterioration or disturbance

Determination of Duration

Duration refers to the amount of time that the environment will be affected by the event, risk or impact, if no intervention e.g. remedial action takes place.

Rating of Duration:

Rating	Description
1	Up to ONE MONTH
2	ONE MONTH to THREE MONTHS (QUARTER)
3	THREE MONTHS to ONE YEAR
4	ONE to TEN YEARS
5	Beyond TEN YEARS

Determination of Extent/Spatial Scale

Extent or spatial scale is the area affected by the event, aspect or impact.

Rating of Extent / Spatial Scale:

Rating	Description
1	Immediate, fully contained area
2	Surrounding area
3	Within Business Unit area of responsibility
4	Within the farm/neighbouring farm area
5	Regional, National, International

Determination of Overall Consequence

Overall consequence is determined by adding the factors determined above and summarized below, and then dividing the sum by 3.

Example of calculating Overall Consequence

Consequence	Rating
Severity	Example 4
Duration	Example 2
Extent	Example 4
SUBTOTAL	**10**
TOTAL CONSEQUENCE: (Subtotal divided by 3)	**3.3**

Determination of Likelihood:

The determination of likelihood is a combination of Frequency and Probability. Each factor is assigned a rating of 1 to 5, as described below and in tables 6 and 7.

Determination of Frequency

Frequency refers to how often the specific activity, related to the event, aspect or impact, is undertaken.

Rating of Frequency:

Rating	Description
1	Once a year or once/more during operation
2	Once/more in 6 Months
3	Once/more a Month
4	Once/more a Week
5	Daily

Determination of Probability

Probability refers to how often the activity or aspect has an impact on the environment.

Rating of Probability:

Rating	Description
1	Almost never / almost impossible
2	Very seldom / highly unlikely
3	Infrequent / unlikely / seldom
4	Often / regularly / likely / possible
5	Daily / highly likely / definitely

Overall Likelihood

Overall likelihood is calculated by adding the factors determined above and summarised below, and then dividing the sum by 2.

Example of calculating Overall Likelihood

Consequence	Rating
Frequency	Example 4
Probability	Example 2
SUBTOTAL	**6**
TOTAL LIKELIHOOD (Subtotal divided by 2)	**3**

Determination of Overall Environmental Significance:

The multiplication of overall consequence with overall likelihood will provide the environmental significance, which is a number that will then fall into a range of **LOW**, **LOW-MEDIUM**, **MEDIUM**, **MEDIUM-HIGH** or **HIGH**, as shown in the table below.

Determination of Overall Environmental Significance

Significance or Risk	Low	Low-Medium	Medium	Medium-High	High
Overall Consequence X Overall Likelihood	1 - 4.9	5 - 9.9	10 - 14.9	15 – 19.9	20 - 25

Qualitative description or magnitude of Environmental Significance

This description is qualitative and is an indication of the nature or magnitude of the Environmental Significance. It also guides the prioritisations and decision making process associated with this event, aspect or impact.

Description of Environmental Significance and related action required

Significance	Low	Low-Medium	Medium	Medium-High	High
Impact Magnitude	Impact is of very low order and therefore likely to have very little real effect. Acceptable.	Impact is of low order and therefore likely to have little real effect. Acceptable.	Impact is real, and potentially substantial in relation to other impacts. Can pose a risk to company	Impact is real and substantial in relation to other impacts. Pose a risk to the company. Unacceptable	Impact is of the highest order possible. Unacceptable. Fatal flaw.
Action Required	Maintain current management measures. Where possible improve.	Maintain current management measures. Implement monitoring and evaluate to determine potential increase in risk. Where possible improve	Implement monitoring. Investigate mitigation measures and improve management measures to reduce risk, where possible.	Improve management measures to reduce risk.	Implement significant mitigation measures or implement alternatives.

Based on the above, the significance rating scale has been determined as follows:

High — Of the highest order possible within the bounds of impacts which could occur. In the case of negative impacts, there would be no possible mitigation and / or remedial activity to offset the impact at the spatial or time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.

Medium-High — Impacts of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this

	benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
Medium	Impact would be real but not substantial within the bounds of those, which could occur. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible, in case of positive impacts; other means of achieving these benefits would be about equal in time, cost and effort.
Low-Medium	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved of little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
Low	Impact would be negligible. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or a number of ways, than this means of achieving the benefit
Insignificant	There would be a no impact at all – not even a very low impact on the system or any of its parts.

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

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

Site Alternative 1 (S1) (Preferred Alternative):

Positive Impacts:

- The mining site offers the mineral sought after;
- The proposed sites were previously used for mining activities, thus minimal environmental damage will occur;
- The mining area can be reached by an existing farm access road that connects to the R723. No new road infrastructure need to be constructed;
- Due to the small size of the activity and the remote location of the mining area the potential impacts on the surrounding environment, associated with mining is deemed to be of low significance; and

- No residual waste as a result of the mining activity will be produced that needs to be treated on site. Any general waste that may be produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site. As maintenance and servicing of the equipment will be done at an off-site workshop the amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental leakage. Contaminated soil will be removed to the depth of the spillage and contained in sealed bins until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site.

Negative Impacts:

- Due to the remote location of the mining area very little negative impacts on the community could be identified that were deemed to be of significant importance. The dust and noise impacts that may emanate from the mining area during the operational phase could have a negative impact on the surrounding community if the mitigation measures proposed in this document is not implemented and managed on-site; and
- Negative impacts with regard to the environment include potential contamination of the area due to spillage of hydrocarbon products.

Site Alternative 2 (S2)

Positive Impacts:

- The site is near the mineral sought after;
- The alternative area will not have to compete with other land uses as all the activities can be contained within the boundaries of the site. Upon closure of the mining area, the land will revert back to agriculture; and
- The aggregate to be mined will be used for the upgrading of the roads in the vicinity of the activity. The alternative mining area will therefore contribute to the upgrading/maintenance of infrastructure in and around Koppies / Parys area and indirectly contribute to the economy of the area.

Negative Impacts:

- The site has not been previously disturbed before; thus the natural area needs to be cleared and is not preferred with regards to sustainable development;
- In the light of the above the impacts associated with establishing another quarry pit in a greenfield site on the property is believed to have a higher significance without the need or motivation to justify it;

- The dust and noise impacts that may emanate from the mining area during the operational phase could have a negative impact on the surrounding land users if the mitigation measures proposed in this document is not implemented and managed on-site; and
- Negative impacts with regard to the environment include potential contamination of the area due to spillage of hydrocarbon products.

vii) The possible mitigation measures that could be applied and the level of risk.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment / discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

Visual Mitigation:

The risk of the proposed mining activity having a negative impact on the aesthetic quality of the surrounding environment can be reduced to a low – medium risk through the implementation of the mitigation measures listed below:

- The site needs to have a neat appearance and be kept in good condition at all times.
- Upon closure the site needs to be rehabilitated to insure that the visual impact on the aesthetic value of the area is kept to a minimum.

Dust Handling:

The risk of dust, generated from the proposed mining activity, having a negative impact on the surrounding environment can be reduced to being low through the implementation of the mitigation measures listed below:

- The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents.
- The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust.
- Roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.

Noise Handling:

The risk of noise, generated from the proposed mining activity, having a negative impact on the surrounding environment can be reduced to being low-medium through the implementation of the mitigation measures listed below:

- The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.
- No loud music may be permitted at the mining area.
- All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.

Management of Weed or Invader Plants:

The risk of weeds or invader plants invading the disturbed area can be reduced to being low through the implementation of the mitigation measures listed below:

- A weed and invader plant control management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure.
- Management must take responsibility to control declared invader or exotic 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 with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide."
  - The temporary topsoil stockpiles need to be kept free of weeds.

Storm Water Handling:

The risk of contamination through dirty storm water escaping from work areas, or erosion or loss of stockpiled topsoil caused due to uncontrolled storm water flowing through the mining area can be reduced to being low through the implementation of the mitigation measures listed below:

- Storm water must be diverted around the topsoil heaps, and access roads to prevent erosion and loss of material.
- Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water 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:

- Runoff water should be diverted around the site areas with trenches and contour structures to prevent erosion of the work areas.
- Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must 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.
- The storm water management plan must apply for the entire life cycle of the mining activity and over different hydrological cycles (rainfall patterns).
- The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management plan.

Handling of Hazardous Materials and Substances:

- All hazardous materials or substances should be stored in a closed storage facility with an impermeable floor.
- The storage area should meet the following conditions:
  - The storage area should be constructed on a level area to prevent offsite migration of any spilled product.
  - The floor of the storage area should be impermeable to prevent seepage of spilled products into the ground or ground water.
  - The storage area should be out of any 1:100-year flood line or further than 100m from an edge of a watercourse, whichever is greatest.
  - The facility should be such that access to the materials/substances can only take place with the prior notification of an appropriate staff member.
- All fuel storage tanks should have secondary containment in the form of an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. This bund capacity should be sufficient to contain 110% of the tank's maximum capacity.
- The distance and height of the bund wall relative to that of the tank should also be taken into consideration to ensure that any spillage does not result in oil spouting beyond the confines of the bund.
- The site manager should 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 should be inspected at least weekly and any accumulated rainwater removed. All valves and outlets should be checked to ensure that they are intact and closed securely.

- The bund base must slope towards a rainwater sump of sufficient size.
- Contaminated water may not be allowed to mix with clean water, and contained until it can be collected by a registered hazardous waste handling contractor or be disposed of at a registered hazardous waste handling facility.
- Drip trays should be available to be place underneath all stationary equipment or vehicles.
- The layer of material at the vehicle service area should be removed and if contaminated with hazardous substances such as hydrocarbons should be disposed of as hazardous waste by an appropriately qualified waste handling contractor. The compacted areas should be ripped and the topsoil returned over the area.
- The site should be cleared of all hazardous substances once decommissioning has been completed and should be disposed of by an appropriately qualified waste handling contractor.

Waste Management:

The risk of waste generation having a negative impact on the surrounding environment can be reduced to being low through the implementation of the mitigation measures listed below:

- No waste stockpile area may be established outside the boundaries of the mining area.
- Vehicle maintenance may only take place within the service bay area.
- The diesel bowser needs to be equipped with a drip tray at all times. Drip trays have to be used during each and every refuelling event.
- The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling.
- Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site.
- Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility.
- Spills must be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing it at a recognised facility. Proof should be filed.
- Suitable covered receptacles should be available at all times and conveniently placed for the disposal of waste.
- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc, should be stored in a container with a closable lid at a collecting point and collected on a regular basis and disposed of at a recognised landfill site. Specific precautions should be taken to prevent refuse from being dumped on or in the vicinity of the mine area.
- Biodegradable refuse generated should be handled as indicated above.

- Water from the wash bay should drain into the oil sump from where it should be removed by an approved contractor.
- Drip trays should be available to be place underneath all stationary equipment or vehicles.
- Waste material of any description, including receptacles, scrap, rubble and tyres, should be removed entirely from the mining area and disposed of at a recognized landfill facility once decommissioning has been completed. It will not be permitted to be buried or burned on the site.

Management of Health and Safety Risks:

The health and safety risk, posed by the proposed mining activity can be reduced to being low through the implementation of the mitigation measures listed below:

- Workers must have access to the correct personal protection equipment (PPE) as required by law.
- All operations must comply with the Occupational Health and Safety Act.

Protection of Fauna and Flora:

The risk on the fauna and flora of the footprint area as well as the surrounding environment, as a result of the proposed mining activity, can be reduced to being low through the implementation of the mitigation measures listed below:

- The site manager should ensure that no fauna is caught, killed, harmed, sold or played with.
- Workers should be instructed to report any animals that may be trapped in the working area.
- No snares may be set or nests raided for eggs or young.
- No plants or trees may be removed without the approval of the ECO.
- Clearing of vegetation has to be restricted to the smallest possible area.

Management of Access Roads:

The risk on the condition of the roads, as a result of the proposed mining activities, can be reduced to being low-medium through the implementation of the mitigation measures listed below:

- Storm water should be diverted around the access roads to prevent erosion.
- Erosion of access road: Vehicular movement must be restricted to existing access routes to prevent crisscrossing of tracks through undisturbed areas. Rutting and erosion of the access road caused as a result of the mining activity should be repaired by the applicant.
- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, should be scarified to a depth of at least 300 mm and graded to an

even surface condition and the previously stored topsoil should be returned to its original depth over the area.

Topsoil Handling:

The risk of loss of topsoil can be reduced to being low through the implementation of the mitigation measures listed below:

- Where applicable the first 300 mm of topsoil should be removed in strips and stored along the boundary of the mining area. Stockpiling of topsoil must be done to protect it from erosion, mixing with overburden or other material. The topsoil must be used to cover the rehabilitated area and improve the establishment of natural vegetation.
- The temporary topsoil stockpiles should be kept free of weeds.
- Topsoil stockpiles should be placed on a levelled area and measures should be implemented to safeguard the piles from being washed away in the event of heavy rains/storm water.
- Topsoil heaps should not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.
- Should natural vegetation not establish on the heaps within 6 months of stockpiling it should be planted with an indigenous grass species.
- Storm- and runoff water should be diverted around the topsoil stockpiles and access roads to prevent erosion.

viii) Motivation where no alternative sites were considered.

Not Applicable

ix) Statement motivating the alternative development location within the overall site. (Provide a statement motivating the final site layout that is proposed)

Inzalo Crushing and Aggregates, identified the need for gravel / aggregate in the area due to an increase in building, construction and road maintenance projects. As mentioned earlier the quarry pit on the property of the applicant has previously been used for mining purposes. In this light the applicant identified the proposed (site alternative 1) area as preferred and only viable site alternative. The facts that the existing quarry have not yet been mined out and will be extended were found to be the best option contrary to sustainable development in terms of site alternative 2.

The opencast mining of the quarry has been identified as the most cost effective method to produce the desired aggregate. The proposed method will not produce any residual waste that has to be

disposed of. Due to the remote location of the quarry the potential impacts on the surrounding environment, associated with opencast mining, is deemed to be of low significance. It is proposed that all mining related infrastructure will be contained within the boundary of the mining area. As no permanent infrastructure will be established on site the layout/position of the temporary infrastructure will be determined by the mining progress and available space within the 22.28 ha mining area.

h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity. (Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures).

During the impact assessment process the following potential impacts were identified of each main activity in each phase. An initial significance rating (listed under *v) Impacts and Risks Identified*) was determined for each potential impact should the mitigation measures proposed in this document not be implemented on-site. The impact assessment process then continued in identifying mitigation measures to address the impact that the proposed processing activity may have on the surrounding environment.

The significance rating was again determined for each impact using the methodology as explained under *vi) Methodology Used in Determining and Ranking the Significance*. The impact ratings listed below was determined for each impact **after** bringing the proposed mitigation measures into consideration and therefore represents the final layout/activity proposal.

Table 34: Bloemhof Quarry Impact Assessment after mitigation measures.

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
CONSTRUCTION / SITE ESTABLISHMENT PHASE													
ACTIVITY:	**DEMARCATION OF SITE WITH VISIBLE BEACONS.**												
	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	Neg		Demarcation of the site will ensure that all employees are aware of the boundaries of the processing area and that work stay within approved area.									Low
ACTIVITY:	**ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.**												
	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	Neg		None.									Low
Social & Safety	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Neg	Reversible	Ensure advertising is limited to local and regional areas, and only specifically advertise for Jobs nationally if skills are not available. Ensure that all power-related structures are adequately marked with relevant signs and warnings and fenced off.	1	2	5	2,7	2	5	3,5	9,333	Low-Med
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9,333	Low-Med
Geology	Disturbance of geological strata	Neg	Irreversible	None.	1	3	5	3	5	5	5	15	Medium-High
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils	1	3	4	2,7	2	4	3	8	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
	Potential hydrocarbon contamination to soils.			should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.									
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used:	1	4	2	2,3	2	3	2,5	5,833	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
				o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.									
Topography	Alteration of topography	Neg	Irreversible	Keep mining in footprint	1	2	5	2,7	2	3	2,5	6,667	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	1	2	2	1,7	3	3	3	5	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. As per SAHRA's recommendation dated 13 September 2018: The stone cairn that may indicate a grave is to be preserved in-situ with a 20 meter buffer zone. If this is not possible, will be proven that it is not a grave in which case no further actions are required. If any graves are located in future they should ideally be preserved in-situ or alternatively relocated according to existing legislation. Implementation of a chance find procedure.	1	1	5	2,3	2	1	1,5	3,5	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	2	2	1	1,7	2	3	2,5	4,167	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	2	2	4	2,7	2	5	3,5	9,333	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any	3	2	4	3	1	1	1	3	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
	activities on the runoff and infiltration of storm water.			leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.									
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4,167	Low
SUB ACTIVITY: ABLUTION FACILITIES													
Groundwater	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	Portable toilets will be managed by reputable contractors and inspected daily for potential leaks	1	2	3	2	2	5	3,5	7	Low-Med
Surface water	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	Portable toilets will be managed by reputable contractors and inspected daily for potential leaks	1	2	3	2	2	5	3,5	7	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Soils	Portable Toilets Potential harm through sewage leaks	Neg	Reversible	Portable toilets will be managed by reputable contractors and inspected daily for potential leaks	1	2	5	2,7	2	5	3,5	9,333	Low-Med
SUB ACTIVITY: ACCESS ROADS													

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	2	2	1	1,7	2	3	2,5	4,167	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4,167	Low
SUB ACTIVITY: SITE OFFICES													

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4,167	Low
SUB ACTIVITY: VEHICLE SERVICE AREA													

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
SUB ACTIVITY: WASH BAY													
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
SUB ACTIVITY: WORKSHOP													
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all	1	4	2	2,3	2	3	2,5	5,833	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
				areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.									
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4,167	Low
SUB ACTIVITY: SALVAGE YARD													
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
SUB ACTIVITY: BUNDED DIESEL AND OIL STORAGE FACILITIES													
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4,167	Low
SUB ACTIVITY: GENERATOR AREA (BUNDED)													

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	2	1	2	1,7	2	3	2,5	4,167	Low
SUB ACTIVITY: WEIGH BRIDGE													
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low
Air quality	Dust nuisance caused by the disturbance of soil.	Neg	Reversible	Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	2	2	1	1,7	2	3	2,5	4,167	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	2	1	2	1,7	2	3	2,5	4,167	Low
SUB ACTIVITY: PARKING AREA													

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low
SUB ACTIVITY: WASTE AREA													
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	4	3	8	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	2	2	4	2,7	2	5	3,5	9,333	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	2	1	2	1,7	2	3	2,5	4,167	Low
ACTIVITY:	**STRIPPING AND STOCKPILING OF TOPSOIL**												
Geology	Disturbance of geological strata	Neg	Irreversible	None.	1	3	5	3	5	5	5	15	Medium-High
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	1	3	4	2,7	2	4	3	8	Low-Med
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	1	4	2	2,3	2	3	2,5	5,833	Low-Med
Topography	Alteration of topography	Neg	Irreversible	Keep mining in footprint	1	2	5	2,7	2	3	2,5	6,667	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers).	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	1	2	2	1,7	3	3	3	5	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
	Degrading of grazing potential for livestock farming												
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. As per SAHRA's recommendation dated 13 September 2018: The stone cairn that may indicate a grave is to be preserved in-situ with a 20 meter buffer zone. If this is not possible, will be proven that it is not a grave in which case no further actions are required. If any graves are located in future they should ideally be preserved in-situ or alternatively relocated according to existing legislation. Implementation of a chance find procedure.	1	1	5	2,3	2	1	1,5	3,5	Low
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	1	1	3	1,7	2	3	2,5	4,167	Low
Air quality	Dust generation	Neg	Reversible	Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable	2	2	1	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
				limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.									
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	2	2	4	2,7	2	5	3,5	9,333	Low-Med
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	3	2	4	3	1	1	1	3	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	2	1	2	1,7	2	3	2,5	4,167	Low
OPERATIONAL PHASE													
ACTIVITY:	**DRILLING AND BLASTING**												
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems.	1	3	4	2,7	2	3	2,5	6,667	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
				o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.									
Noise	Noise nuisance generated by drilling equipment and blasting	Neg	Reversible	Blasting alternatives will be considered to reduce noise and associated vibrations	2	1	1	1,3	1	3	2	2,667	Low
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
				basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.									
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	1	4	2	2,3	5	3	4	9,333	Low-Med
Topography	Alteration of topography	Neg	Irreversible	Proliferation of alien and invasive species is expected within any disturbed areas particularly as there are some alien and invasive species within the study area at present. These species should be eradicated and controlled to prevent further spread beyond the study area; · It is suggested that an alien plant removal program be initialised within the study area in order to help reinstate more natural hydrological and ecological functions to within the project site; · Alien plant seed dispersal within the top layers of the soil within footprint areas, that will have an impact on future rehabilitation, has to be controlled; · Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used; · Footprint areas should be kept as small as possible when removing alien plant species; · No vehicles should be allowed to drive through designated sensitive drainage lines and riparian areas during the eradication of alien and weed species. · All alien vegetation in the riparian zone should	1	2	5	2,7	2	3	2,5	6,667	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
				be removed upon completion of mining activities and reseeded with indigenous grasses as specified by a suitably qualified specialist (ecologist);									
Geology	Disturbance of geological strata	Neg	Irreversible	None.	1	3	5	3	5	1	3	9	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	1	2	2	1,7	3	3	3	5	Low-Med
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. As per SAHRA's recommendation dated 13 September 2018: The stone cairn that may indicate a grave is to be preserved in-situ with a 20 meter buffer zone. If this is not possible, will be proven that it is not a grave in which case no further actions are required. If any graves are located in future, they should ideally be preserved in-situ or alternatively relocated according to existing legislation. Implementation of a chance find procedure.	1	1	5	2,3	2	1	1,5	3,5	Low
Noise	Noise nuisance generated by drilling equipment and blasting	Neg	Reversible	Blasting alternatives will be considered to reduce noise and associated vibrations	1	1	1	1	1	3	2	2	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Air quality	Dust generation	Neg	Reversible	Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. Roads will be sprayed with water regularly ,especially during times of high dust generation.	1	1	1	1	1	3	2	2	Low
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	2	2	4	2,7	2	5	3,5	9,333	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	2	1	2	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Wetlands and Pans	Impact on the water quality. Changes to the hydrological regime of the stream	Neg	Reversible	Any activities that take place within 32 meters of a wetland or watercourse or the 1:100 year flood lines will require authorisation in terms of the relevant regulations of NEMA, however as far as possible infrastructure should be placed outside of wetlands and / or buffer lines. · No stockpiling should take place within a watercourse or the 32m buffer. · All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds · Erosion and sedimentation into channels must be minimised through the effective stabilisation (gabions and Reno mattresses) and the re-vegetation of any disturbed stream banks; · Ensure that erosion management and sediment controls are strictly implemented from the beginning of site clearing activities, particularly as the soils in the study area are prone to erosion; · All areas should be re-sloped and top-soiled where necessary and reseeded with indigenous grasses to stabilise the loose material; · Edge effects such as erosion must be strictly monitored and managed; · A sensitivity map has been developed for the study area, indicating the drainage lines and riparian systems, and their relevant buffer zones. It is recommended that this sensitivity map be considered during all phases of the development and with special mentioning of the planning of infrastructure, in order to aid in the conservation of and minimise impact on the riparian and aquatic habitat and resources within the study area; · Rehabilitation must ensure that the wetland structure and function are reinstated in such a way as to ensure the ongoing functionality of the larger wetland systems at pre-mining levels. · Any areas where bank failure is observed, due to the prospecting or mining impacts, should be immediately repaired; · As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. Should temporary roads or access routes be necessary and unavoidable, proper planning must take place and the site sensitivity plan must be taken into consideration. If additional roads are required, then wherever feasible such roads should be constructed a distance from the more sensitive riparian areas and not directly adjacent thereto. If crossings are required they should cross the systems at right angles, as far as possible to minimise impacts in the receiving environment; · The duration of impacts on the drainage line should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised; · Stabilisation of banks by employing one of the individual techniques below or a combination thereof, is essential, given the inherent susceptibility of the soils to erosion. Such measures include: o Re-sloping of banks to a maximum of a 1:3 slope; o Revegetation of re-profiled slopes; o Temporary stabilisation of slopes using geotextiles; and o Installation of gabions and reno-mattresses. o To prevent the further erosion of soils, management measures may include berms, soil traps, hessian curtains and storm water diversion away from areas	4	4	4	4	5	3	4	16	Medium-High

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
				particularly susceptible to erosion; · Install erosion berms during construction to prevent gully formation: o Berms every 50m should be installed where any disturbed soils have a slope of less than 2%, o Berms every 25m where the track slopes between 2% and 10%, 8 o Berms every 20m where the track slopes between 10% and 15% and o Berms every 10m where the track slope is greater than 15%; · Sheet runoff from access roads should be slowed down by the strategic placement of berms and/or sandbags; · All soils compacted as a result of construction activities falling outside of project areas should be ripped and profiled. Special attention should be paid to alien and invasive control within these areas. Alien and invasive vegetation control should take place throughout all construction and rehabilitation phases to prevent loss of floral habitat; · As far as possible, all rehabilitation activities should occur in the low flow season, during the drier winter months. · Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench. All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent entry of hydrocarbons into topsoil and groundwater; · All spills, should they occur, should be immediately cleaned up and treated accordingly. · Chemicals used for mining, vehicle maintenance and construction must be stored safely on site but outside the 32m buffer and surrounded by bunds. Chemical storage containers must be regularly inspected so that any leaks are detected early. · Littering and contamination of water sources during mining must be prevented by effective site management. · Emergency plans must be in place in case of spillages especially in the watercourse. · No stockpiling should take place within a watercourse. · All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. · Stockpiles must be located away from river channels. · Erosion and sedimentation into channels must be minimised through the effective stabilisation (gabions and Reno mattresses) and the re-vegetation of any disturbed riverbanks. · The construction camp and necessary ablution facilities meant for construction workers must be beyond the 32m buffer described previously.									
Wetlands and Pans	Loss of riparian vegetation, aquatic habitat and stream continuity (migration corridors)	Neg	Reversible		2	1	2	1,7	5	3	4	6,667	Medium-Low
ACTIVITY:	**EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED**												

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	1	4	2	2,3	2	3	2,5	5,833	Low-Med
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Neg	Irreversible	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. As per SAHRA's recommendation dated 13 September 2018: The stone cairn that may indicate a grave is to be preserved in-situ with a 20 meter buffer zone. If this is not possible, will be proven that it is not a grave in which case no further actions are required. If any graves are located in future they should ideally be preserved in-situ or alternatively relocated according to existing legislation. Implementation of a chance find procedure.	1	1	5	2,3	2	1	1,5	3,5	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	2	1	2	1,7	2	3	2,5	4,167	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under	2	1	2	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
	contamination through littering leeching into the groundwater table			potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.								
ACTIVITY:	**CRUSHING AND SCREENING OF AGGREGATES**												
Noise	Noise nuisance caused by crushing plant.	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	2	1	4	2,3	3	5	4	9,333	Low-Med
Hazardous Waste	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	3	2,5	6,667	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Air quality	Dust generation	Neg	Reversible	Dust will be contained within the property boundaries and will therefore affect only the landowner.	2	2	1	1,7	2	3	2,5	4,167	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low
Fauna	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Neg	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Conduct annual surveys to monitor faunal biodiversity. Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	2	2	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	2	1	2	1,7	2	3	2,5	4,167	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	2	1	2	1,7	2	3	2,5	4,167	Low
ACTIVITY:	**STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS**												

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	3	2,5	6,667	Low-Med
Hazardous Waste	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded	1	3	4	2,7	2	5	3,5	9,333	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
				containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.									
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med
Noise	Noise nuisance caused by vehicles	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	2	1	4	2,3	2	2	2	4,667	Low
Air quality	Dust generation	Neg	Reversible	Dust will be contained within the property boundaries and will therefore affect only the landowner.	2	2	1	1,7	2	3	2,5	4,167	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low
Traffic and Safety	Road degradation. Increased potential for road incidences Potential distraction to road users	Neg	Reversible	All intersections with main tarred roads will be clearly signposted. drivers will be enforced to keep to set speed limits. Trucks will be road-worthy condition. A fund will be set aside to maintain the serviceability of the road verge where the trucks approach or depart from the main road. Ensure directional floodlights are utilized that focus light on the necessary areas and reduce light pollution to surrounding environment.	2	1	4	2,3	2	2	2	4,667	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	2	1	2	1,7	2	3	2,5	4,167	Low
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	2	1	2	1,7	2	3	2,5	4,167	Low
DECOMISIONING PHASE													
ACTIVITY:	**SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)**												

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Soils	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Neg	Reversible	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: o Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. o Dirty water must be collected and contained in a system separate from the clean water system. o Dirty water must be prevented from spilling or seeping into clean water systems. o Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). o The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	1	3	4	2,7	2	3	2,5	6,667	Low-Med
Soils	Soils replaced and ameliorated	Pos	Reversible	Ensure activities occur only within the designated areas and stockpile and revegetated soil as soon as possible. Topsoil will be removed before mining activities commence and stored outside of the active mining cell.	1	3	4	2,7	2	3	2,5	6,667	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Flora	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Neg	Reversible	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas. Plan activities carefully so that only vegetation that needs to be impacted is impacted. Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. Limit activity to area of disturbance and revegetated impacted areas as soon as possible. Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated areas. The following control methods can be used: o "The plants can be uprooted, felled or cut off and can be destroyed completely." o "The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	1	4	2	2,3	2	3	2,5	5,833	Low-Med
Topography	Alteration of topography	Neg	Irreversible	Keep mining in footprint. Excavation areas will be sloped during rehabilitation to even out depressions.	1	2	5	2,7	2	3	2,5	6,667	Low-Med
Topography	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Pos	Irreversible	Monitor, especially after first heavy rain falls to ensure adequate surface water drainage	1	2	5	2,7	2	3	2,5	6,667	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	1	2	2	1,7	3	3	3	5	Low-Med
Visual aspect	Improved aesthetics through rehabilitation	Pos	Reversible	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	2	1	3	2	2	3	2,5	5	Low-Med

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Noise	Noise nuisance caused by machinery	Neg	Reversible	Noise Handling: The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. No loud music may be permitted at the processing area. All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	2	1	4	2,3	3	3	3	7	Low-Med
Air quality	Dust nuisance caused during landscaping activities	Neg	Reversible	Dust will be contained within the property boundaries and will therefore affect only the landowner.	2	2	1	1,7	2	3	2,5	4,167	Low
Air quality	Emissions caused by vehicles and equipment	Neg	Reversible	Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	2	2	1	1,7	2	3	2,5	4,167	Low
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Conduct annual surveys to monitor faunal biodiversity.	2	2	4	2,7	2	5	3,5	9,333	Low-Med
Fauna	Reintroduction of fauna attracted to flora to the area	Pos	Reversible	Inform staff, contractors and visitors to not harm fauna in the area. Conduct annual surveys to monitor faunal biodiversity.	2	1	3	2	1	3	2	4	Low
Social & Safety	Health and safety risk posed by un-sloped areas	Neg	Reversible	Ensure that all stuff are made aware of all working conditions on site	2	1	3	2	1	3	2	4	Low
Surface water	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	2	1	2	1,7	2	3	2,5	4,167	Low
Surface water	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Pos	Reversible	Specialist must be consulted f issues with surface water are observed and qualities do not fall within the DWS target qualities or water qualities for livestock watering. Any affected registered water user must be compensated if levels a quality are impacted by the mining activities. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Monitor area for erosion and pooling and rehabilitate if necessary. Continue with Surface water monitoring.	2	1	2	1,7	2	3	2,5	4,167	Low

Nature of Impact	Impact	Positive/Negative/ Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Hazardous Waste	Contamination of area with hydrocarbons or hazardous waste materials	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	1	3	4	2,7	2	5	3,5	9,333	Low-Med
Groundwater	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Neg	Reversible	Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. All leaks will be cleaned up immediately using an absorbent material. Rigs will be regularly serviced to reduce risk of leaks. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company.	2	1	2	1,7	2	3	2,5	4,167	Low
Groundwater	Improve response to issues relating to deterioration of groundwater quality or quantity	Pos	Reversible	Specialist must be consulted f issues with groundwater are observed and qualities do not fall within the DWS target qualities or water qualities for livestock watering. Any affected registered water user must be compensated if levels an quality are impacted by the mining activities	2	1	2	1,7	2	5	3,5	5,833	Low-Med
ACTIVITY: Application for Closure Certificate													

Environmental aspects to be assessed as part of the EIA process will include the following:

1) VISUAL EXPOSURE:
   - The mining area was identified to constitute the lowest possible visual impact on the surrounding environment. The surrounding area has previously been disturbed by mining activities, and this application entails the extension of the existing mining area.
   - The applicant should however ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the mine.
   - Upon closure the site will be rehabilitated and sloped to insure that the visual impact on the aesthetic value of the area is kept to a minimum.
   - The site will have a neat appearance and be kept in good condition at all times.

2) ABLUTION, WASTE WATER & WASTE DISPOSAL:
   - Ablution facilities will consist of chemical toilets or temporary ablution facilities with septic tank hired from a contractor and serviced regularly.
   - Any effluents containing oil, grease or other industrial substances will be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility.
   - Spills would be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognised facility.
   - Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., will be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognised landfill site.
   - Biodegradable refuse generated will be handled as indicated above.
   - No waste will be burned or buried on site.

3) DUST:
   - Speed on the access road will be limited to 40km/h to prevent the generation of excess dust.
   - Roads will be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.

4) NOISE:
   - It will be ensured that employees and staff conduct themselves in an acceptable manner while on site.

- All mining vehicles will be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.
- The type, duration and timing of the blasting procedures will be planned with due cognisance of other land users and structures in the vicinity.
- Surrounding land owners will be notified in writing prior to blasting occasions.

5) ACCESS ROUTE:

- The existing farm road to the area will be used to provide the applicant with access.
- Should any other access roads to the mining area be required it will be established in consultation with the landowner however existing roads will be used as far as practicable.
- All new roads will be selected as far as possible to avoid watercourses and steep gradients. Adequate drainage and erosion protection in the form of cut-off berms or trenches will be provided where necessary.
- The roads to be established to the site will be below the threshold of the EIA regulations of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended June 2014.
- The gravel road that access the site will be used to transport the material from the site to the R723, from the R723 to the N1.

6) SURFACE AND GROUND WATER:

- The proposed mining area will be further than 100m from any natural water source.
- The proposed activities are not expected to have a negative impact on the surface or ground water of the area.

SURFACE AND GROUNDWATER:

Greenmined will use in-house specialists to review the environmental aspects which will be assessed as part of the environmental impact assessment process. The environmental aspects briefly described in the DEIAR have been updated, and site and technology specific impacts and mitigation recommendations have been made and be reviewed by the project team. A wetland delineation study will be conducted by a specialist. This report is included into the FEIAR in Appendix 18.

ARCHAEOLOGICAL AND CULTURAL:

HCAC was appointed to conduct a Heritage Impact Assessment for a proposed mining right application for the expansion of an existing quarry, Please refer to Appendix 14 for the specialist report. The study area was assessed both on desktop level and by a field survey. The field survey

was conducted as a non-intrusive pedestrian survey to cover the extent of the mining right footprint. Impacts from mining activities relating to the existing quarry occurred from the 1990's onwards, in addition the surrounding area was cultivated. These activities would have impacted on surface indicators of heritage sites and no archaeological sites or artefacts of significance were recorded during the survey. In terms of the palaeontological component the area is indicated as of insignificant sensitivity on the SAHRIS paleontological map and no further studies are required in this regard.
No further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed. In terms of the built environment of the area (Section 34), no structures older than 60 years occur in the study area. In terms of Section 36 of the Act no burial sites were recorded, however one stone cairn of unknown age and purpose was recorded. The cairn is possibly the result of clearing the fields for agricultural purposes but, although unlikely, the cairn could indicate an informal grave. No public monuments are located within or close to the study area. The study area is characterised by an existing quarry and associated infrastructure and the proposed development will not impact negatively on significant cultural landscapes or views capes. During the public participation process conducted for the project no heritage concerns was raised (HCAC, 2018).

The impact on heritage resources in the study area can be mitigated to an acceptable level and it is recommended that the proposed project can commence on the condition that the recommendations in this report are implemented as part of the EMPr and based on approval from SAHRA. Furthermore, the socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project (HCAC, 2018).

Final comment received from SAHRA (13 September 2018):

The author found no evidence of archaeological sites or artefacts of significance, structures older than 60 years, public monuments or burial sites; however, one stone cairn may, although unlikely, indicate an informal grave. The proposed area is indicated as of insignificant palaeontological sensitivity on the SAHRIS
paleontological map. The impact on heritage resources is therefore considered low.
The following recommendations are to be implemented as part of the EMPr:

- The stone cairn that may indicate a grave is to be preserved in-situ with a 20meter buffer zone. If this is not possible, it must be proven that it is not a grave in which case no further actions are required.
- If any graves are located in future they should ideally be preserved in-situ or alternatively relocated according to existing legislation.
- Implementation of a chance find procedure.

i) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked Appendix 11**.**

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
whether listed or not listed	(Including the potential impacts for cumulative impacts)		In which impact is anticipated	if not mitigated	(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)	if mitigated
(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc. Etc.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)		(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))		E.g. Modify through alternative method. Control through noise control. Control through management and monitoring. Remedy through rehabilitation.	
DEMARCATION OF SITE WITH VISIBLE BEACONS.	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	N/A	Construction / Site Establishment phase	Low	N/A	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	N/A	Construction / Site Establishment phase	N/A	N/A	N/A
	Portable Toilets Potential harm through sewage leaks	Groundwater		Med	Control through proper site management	Low-Med
	Portable Toilets Potential harm through sewage leaks	Surface Water		Med	Control through proper site management	Low-Med
	Portable Toilets Potential harm through sewage leaks	Soils		Med	Control through proper site management	Low-Med
	Portable Toilets Potential harm through sewage leaks	Social		Med	Control through proper site management	Low-Med
	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.		Low-Med	Control: Implementation of proper housekeeping	Low-Med
	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Medium	Control: Dust suppression	Low
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Med	Control: Emissions	Low
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Med	**Control:** Noise control measures	Low
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		Low-Med	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Low-Med
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		Med	**Control:** Storm water management Site Management Soil Management	Low – Medium
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Med	Control: Waste management	Low-Med
	Alteration of topography	Topography		Medium - High	Control: Surface water Monitoring	Medium-...
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		Med	**Control:** Survey area before site clearance	Low
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Med	Control: Proper site management.	Low
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies	Operational phase	Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Med	<u>Control:</u> Implementation of fauna protection measures	Low-Med
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). <u>Degrading of grazing potential for livestock farming</u>	Land use		Low-Med	<u>Control:</u> <u>Fire</u>	Low-Med
	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Social		Low-Med	Control through proper site management	Low-Med
STRIPPING AND STOCKPILING OF TOPSOIL	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.		Low-Med	<u>Control:</u> Implementation of proper housekeeping	Low-Med
	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Medium	<u>Control:</u> Dust suppression	Low
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Medium	<u>Control:</u> Emissions	Low
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Medium	**<u>Control:</u>** Noise control measures	Low
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		Low-Med	**<u>Control & Remedy:</u>** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Low-Med
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		Med	**<u>Control:</u>** Storm water management Site Management Soil Management	Low – Medium
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Medium	<u>Control:</u> Waste management	Low-Med
	Alteration of topography	Topography		Low-Med	<u>Control:</u> Surface water Monitoring	Low-Med
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		Med	**<u>Control:</u>** Survey area before site clearance	Low
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution	Operational phase	Med	<u>Control:</u> Proper site management.	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
STRIPPING AND STOCKPILING OF TOPSOIL	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies	Operational phase	Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Med	Control: Implementation of fauna protection measures	Low-Med
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Low-Med	Control: Fire	Low-Med
	Disturbance of geological strata	Geology		Low-Med	N/A	Low-Med
DRILLING AND BLASTING	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.		Low-Med	Control: Implementation of proper housekeeping	Low-Med
	Dust nuisance due to excavation activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Low	Control: Dust Suppression	Low
	Noise nuisance generated by drilling equipment and blasting	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Low	Control: Noise Control Measures	Low
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Impact on the water quality. Changes to the hydrological regime of the stream	Wetlands and Pans		High	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Medium-High
	Loss of riparian vegetation, aquatic habitat and stream continuity (migration corridors)	Wetlands and Pans		High	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Medium-Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Low-Med	Control: Proper site management.	Low
DRILLING AND BLASTING	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Operational phase	Med	**Control:** Storm water management Site Management Soil Management	Low-Med
	Health and Safety Risk by Blasting Activities. Potential danger to surrounding communities	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented		Low	Control: Implementation of safety control measures	Low
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Low-Med	Control: Implementation of fauna protection measures	Low
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		High	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Low-Med
	Alteration of topography	Topography		Low-Med	Control: Surface water Monitoring	Low-Med
	Disturbance of geological strata	Geology		Low-Med	N/A	Low-Med
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Low-Med	Control: Fire	Low-Med
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Medium	Control: Waste management	Low-Med
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		Med	**Control:** Survey area before site clearance	Low
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
EXCAVATION AND LOADING	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.		Med	Control: Implementation of proper housekeeping	Low-Med

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	Dust nuisance due to excavation activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Med	Control: Dust Suppression	Low
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Med	Control: Dust suppression	Low – Mediu
	Noise nuisance generated by excavation equipment	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Low-Med	Control: Noise Control Measures	Low
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		Med	**Control:** Storm water management Site Management Soil Management	Low-Med
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Low-Med	Control: Proper site management.	Low
	Unsafe working conditions for employees	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented		Low-Med	Control: Implementation of safety control measures	Low-Med
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Med	Control: Implementation of fauna protection measures	Low
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		Med	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Low-Med
	Alteration of topography	Topography		Low-Med	Control: Surface water Monitoring	Low-Med
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Medium	Control: Waste management	Low-Med
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		Med	**Control:** Survey area before site clearance	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Low-Med	Control: Fire	Low-Med
	Disturbance of geological strata	Geology		Low	N/A	Low
CRUSHING AND SCREENING OF AGGREGATES	Dust nuisance due to loading and transportation of the material	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Low-Med	Control: Dust suppression	Low
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Low-Med	Control: Emissions	Low – Medium
	Noise nuisance caused by crushing plant.	The noise impact must be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Med	Control: Noise Control Measures	Low-Med
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Low-Med	Control: Implementation of fauna protection measures	Low-Med
	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.		Low-Med	Control: Implementation of proper housekeeping	Low-Med
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		Med	**Control:** Storm water management Site Management Soil Management	Low-Med
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Low-Med	Control: Proper site management.	Low
STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	Dust nuisance due to loading and transportation of the material	Should dust levels become excessive it may have an impact on surrounding landowners.		Low-Med	Control: Dust suppression	Low
	Emissions caused by vehicles and equipment	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Low-Med	Control: Dust suppression	Low
	Road degradation. Increased potential for road incidences Potential distraction to road users	All road users will be affected		Low-Med	Control & Remedy: Road management	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	Noise nuisance caused by vehicles	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.	Operational phase	Low-Med	Control: Noise control measures	Low
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		Med	**Control:** Storm water management Site Management Soil Management	Low-Med
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Low-Med	Control: Proper site management.	Low
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.		Low-Med	Control: Implementation of proper housekeeping	Low-Med
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Medium	Control: Waste management	Low
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Decommissioning phase	Med	**Control:** Storm water management Site Management Soil Management	Low-Med
	Soils replaced and ameliorated	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		Med	**Control:** Storm water management Site Management Soil Management	Low-Med
	Dust nuisance caused during landscaping activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Low-Med	Control: Dust Suppression	Low
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Low-Med	Control: Emissions	Low
	Noise nuisance caused by machinery	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Low-Med	Control: Noise Management	Low-Med
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Low-Med	Control: Proper site management.	Low
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Medium	Control: Waste management	Low
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		Low-Med	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work	Low-Med

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
					areas. Modify: Consider use of a less sensitive area	
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Improve response to issues relating to deterioration of groundwater quality or quantity	Groundwater improvement	Decommissioning phase	Low-Med	Control: Proper site management.	Low-Med
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Surface water Bodies		Low-Med	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low
	Health and safety risk posed by un-sloped areas	The impact on health and safety due to un-sloped areas will be contained within the site boundary.		Mediu m	Control: Sloping of areas upon decommission	0
	Reintroduction of fauna attracted to flora to the area	Fauna returning to area		Low-Med	Control: Implementation of fauna protection measures	Low
	Alteration of topography	Topography		Low-Med	Control: Surface water Monitoring	Low-Med
	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Topography		Low-Med	Control: Surface water Monitoring	Low-Med
	Improved aesthetics through rehabilitation	The visual impact may affect the aesthetics of the landscape.		Low-Med	Control: Implementation of proper housekeeping	Low-Med
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Low-Med	Control: Fire	Low-Med

j) Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Archaeological Study	The impact on heritage resources in the study area is considered low and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA: • Although unlikely, the stone cairn could indicate a grave. It is therefore recommended that the cairn is preserved in-situ with a 20-meter buffer zone. If this is not possible, it must be proven that it is not a grave in which case no further actions are required. • If any graves are located in future, they should ideally be preserved in-situ or alternatively relocated according to existing legislation. • Implementation of a chance find procedure as detailed below. The possibility of the occurrence of subsurface finds cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefor chance find procedures should be put in place as part of the EMP. A short	X	Part A, g) v), (1) Part A, g) vi), (1) Part A, k) v), (1) Part A, l) v), (1) Part B, 1, e) Part B, 1, f) Part B, 1, i) Part B, 1, m)

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
	summary of chance find procedures is discussed below. This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below. • If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. • 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 will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.		

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Wetland Delineation study	The results of the impact assessment indicate that although the impacts prior to mitigation may potentially be Medium-High to High, strict and effective implementation of mitigation measures will reduce the impact significance to medium-low, levels. In view of the fact that large portions of the study area and the catchment of the watercourse have already been impacted due to human activities such as mining, crop production, construction of roads, dams, farm steads, etc. It is the opinion of the specialist that should the mitigation measures, be adhered to, the proposed mining activities may have a lower risk to the wetland or riparian resources or natural vegetation within the project site than without the mitigation measures.	X	Part A, g) v), (1) Part A, g) vi), (1) Part A, k) v), (1) Part A, l) v), (1) Part B, 1, e) Part B, 1, f) Part B, 1, i) Part B, 1, m)

Copies of the specialist reports will be included in the FEIAR in Appendix 17 and Appendix 18.

k) Environmental impact statement

i) Summary of the key findings of the environmental impact assessment;

Please refer to the Environmental Impact Assessment in Appendix 11 the key findings of the environmental impact assessment entail the following:

- The project entails the excavation mining of aggregates in an area previously used for mining. Due to the small area used for grazing and mining, mining of aggregates in the area was identified as a more viable use. As a result of the agricultural activities no natural areas needs to be disturbed.
- The mining procedure will only entail the excavation and transporting of the aggregates by means of a front-end loader upon which it will be loaded onto trucks and transported from the mining site to the stockpiling site. The clients will then acquire the aggregate from the stockpiling site.
- The existing roads to the mine area can be used to gain access to the site. No new roads are needed.
- The proposed mining area will be visible from the N1 and the R723 Heilbron / Vredefort off ramp passing the property and will therefore have a visual impact on the immediate surrounding area.
- Mining activities will be contained within the boundaries of the permitted site. Proper storm water and waste management however needs to be implemented on the site in order to minimise the potential of pollution.

LAND USE

The proposed quarry will be established in an area that was previously used for mining purposes as well as agriculture. The quarry will therefore not have to compete with other land uses at the site. Upon closure of the mining area, the land will revert back to agricultural grazing for livestock farming.

Due to the remote location of the quarry very little to no negative impacts on the community could be identified that were deemed to be of significant importance. The dust and noise impacts that may emanate from the mining area during the operational phase could have a negative impact on the surrounding community if the mitigation measures proposed in this document is not implemented and managed on-site.

SURFACE AND GROUND WATER

A portion of the existing quarry is currently filled with rain water; mining at the site is not anticipated to be affected by the water in the quarry as a wall will be left between the existing pit and the proposed mining area. Application has been made to the Department of Water and Sanitation to use the water for dust suppression. Storm water management and erosion prevention measures must be implemented on-site.

A wetland delineation and ecology study was conducted by a specialist whereby the requirements from the specialist is included in this section in the FEIAR, please refer to Appendix 18 for the study conducted.

The results of the impact assessment indicate that although the impacts prior to mitigation may potentially be Medium-High to High, strict and effective implementation of mitigation measures will reduce the impact significance to medium-low, levels. In view of the fact that large portions of the study area and the catchment of the watercourse have already been impacted due to human activities such as mining, crop production, construction of roads, dams, farm steads, etc. It is the opinion of the specialist that should the mitigation measures, be adhered to, the proposed mining activities may have a lower risk to the wetland or riparian resources or natural vegetation within the project site than without the mitigation measures.

General mitigation measures which must also be implemented include the following:

- Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer.
- All construction vehicles should adhere to a low speed limit (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises.
- All mining footprint areas should remain as small as possible and should as far as possible not encroach into surrounding areas. It must be ensured that where possible the riparian and drainage line systems, and their associated buffer zones are off-limits to construction vehicles and personnel;
- The boundaries of footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas;
- Appropriate sanitary facilities must be provided during the mining phase and all waste removed to an appropriate waste facility (landfill);
- No informal fires should be permitted in within the study area;
- Ensure that an adequate number of rubbish bins are provided so as to prevent litter and ensure the proper disposal of waste generated during construction activities;

- Ensure that as far as possible all infrastructure is placed outside of drainage lines and riparian areas and their respective buffer zones. Where this is not possible, construction footprints must be kept as small as possible and impacts must be minimized as far as possible.

WETLAND AND WETLAND ECOLOGY

The proposed mining development will have a “Negative-moderate” impact on the aboveground ecology of the site as some areas are already partly degraded. On undisturbed areas the impact will be high. The impacts such as erosion potential, dust generation and spread of alien weeds can be lowered if mitigated properly. The project site has a low ecological sensitivity because of the presence of several man-made impacts on the site.

With the diligent implementation of mitigating measures by the developer, contractors, and operational staff, the severity of these impacts can be minimised and reduced to acceptable levels. The impact on fauna is expected to be small to low due to the existing disturbance and human activities.
A wetland delineation and ecology study was conducted by a specialist whereby the requirements from the specialist is included in this section in the FEIAR, please refer to Appendix 18 for the study conducted.

The results of the impact assessment indicate that although the impacts prior to mitigation may potentially be Medium-High to High, strict and effective implementation of mitigation measures will reduce the impact significance to medium-low, levels. In view of the fact that large portions of the study area and the catchment of the watercourse have already been impacted due to human activities such as mining, crop production, construction of roads, dams, farm steads, etc. It is the opinion of the specialist that should the mitigation measures, be adhered to, the proposed mining activities may have a lower risk to the wetland or riparian resources or natural vegetation within the project site than without the mitigation measures.

General mitigation measures which must also be implemented include the following:

- Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer.
- All construction vehicles should adhere to a low speed limit (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises.
- All mining footprint areas should remain as small as possible and should as far as possible not encroach into surrounding areas. It must be ensured that where possible the riparian and

drainage line systems, and their associated buffer zones are off-limits to construction vehicles and personnel;

- The boundaries of footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas;
- Appropriate sanitary facilities must be provided during the mining phase and all waste removed to an appropriate waste facility (landfill);
- No informal fires should be permitted in within the study area;
- Ensure that an adequate number of rubbish bins are provided so as to prevent litter and ensure the proper disposal of waste generated during construction activities;
- Ensure that as far as possible all infrastructure is placed outside of drainage lines and riparian areas and their respective buffer zones. Where this is not possible, construction footprints must be kept as small as possible and impacts must be minimized as far as possible.

FLORA

As this site has previously been used for the mining of Felsic rock, the vegetation of the proposed area is highly disturbed. Although the surrounding area (around the existing quarry) has natural vegetation with some bulbs and forbs, the proposed mining area has only pioneer species present on site. No protected or sensitive plant species were noted during the site inspection in the proposed mining area.

The alternative site (site alternative 2) is in a new area, vegetation clearance and topsoil removal need to be done in the riparian zone of an artificial wetland if pursued. Although the site alternative (Site alternative 2) offers, the mineral sought after the mining area will be within 100 m from an artificial wetland. This will necessitate a water use license application to be approved by DWS prior to commencement of the mining activities.

A wetland delineation and ecology study was conducted by a specialist whereby the requirements from the specialist is included in this section in the FEIAR, please refer to Appendix 18 for the study conducted.

The results of the impact assessment indicate that although the impacts prior to mitigation may potentially be Medium-High to High, strict and effective implementation of mitigation measures will reduce the impact significance to medium-low, levels. In view of the fact that large portions of the study area and the catchment of the watercourse have already been impacted due to human activities such as mining, crop production, construction of roads, dams, farm steads, etc. It is the opinion of the

specialist that should the mitigation measures, be adhered to, the proposed mining activities may have a lower risk to the wetland or riparian resources or natural vegetation within the project site than without the mitigation measures.

General mitigation measures which must also be implemented include the following:

- Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer.
- All construction vehicles should adhere to a low speed limit (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises.
- All mining footprint areas should remain as small as possible and should as far as possible not encroach into surrounding areas. It must be ensured that where possible the riparian and drainage line systems, and their associated buffer zones are off-limits to construction vehicles and personnel;
- The boundaries of footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas;
- Appropriate sanitary facilities must be provided during the mining phase and all waste removed to an appropriate waste facility (landfill);
- No informal fires should be permitted in within the study area;
- Ensure that an adequate number of rubbish bins are provided so as to prevent litter and ensure the proper disposal of waste generated during construction activities;
- Ensure that as far as possible all infrastructure is placed outside of drainage lines and riparian areas and their respective buffer zones. Where this is not possible, construction footprints must be kept as small as possible and impacts must be minimized as far as possible.

FAUNA

The fauna at the site will not be impacted by the proposed mining activity as they will be able to move away or through the site, without being harmed. Workers must be informed and managed to ensure that no fauna at the site is harmed. The fauna that has been spotted on site comprise of hares and goats. Upon commencement of the proposed mining activities, the fence surrounding the property must be maintained to prevent large animals such as goats entering the site.

A wetland delineation and ecology study was conducted by a specialist whereby the requirements from the specialist is included in this section in the FEIAR, please refer to Appendix 18 for the study conducted.

The results of the impact assessment indicate that although the impacts prior to mitigation may potentially be Medium-High to High, strict and effective implementation of mitigation measures will reduce the impact significance to medium-low, levels. In view of the fact that large portions of the study area and the catchment of the watercourse have already been impacted due to human activities such as mining, crop production, construction of roads, dams, farm steads, etc. It is the opinion of the specialist that should the mitigation measures, be adhered to, the proposed mining activities may have a lower risk to the wetland or riparian resources or natural vegetation within the project site than without the mitigation measures.

General mitigation measures which must also be implemented include the following:

- Any fauna threatened by the construction and operation activities should be removed to safety by the ECO or appropriately qualified environmental officer.
- All construction vehicles should adhere to a low speed limit (<30km/h) to avoid collisions with susceptible species such as snakes and tortoises.
- All mining footprint areas should remain as small as possible and should as far as possible not encroach into surrounding areas. It must be ensured that where possible the riparian and drainage line systems, and their associated buffer zones are off-limits to construction vehicles and personnel;
- The boundaries of footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas;
- Appropriate sanitary facilities must be provided during the mining phase and all waste removed to an appropriate waste facility (landfill);
- No informal fires should be permitted in within the study area;
- Ensure that an adequate number of rubbish bins are provided so as to prevent litter and ensure the proper disposal of waste generated during construction activities;
- Ensure that as far as possible all infrastructure is placed outside of drainage lines and riparian areas and their respective buffer zones. Where this is not possible, construction footprints must be kept as small as possible and impacts must be minimized as far as possible.

AIR QUALITY

The background air quality of the surrounding area is relatively good due to low industrial activity. Factors contributing to air pollution are the burning of veld, coal power stations, mines and agriculture in the area. Given the surrounding extent of mostly covered areas, no extreme dust generation under windy conditions is experienced.

Dust will be generated by the proposed operation through blasting and the movement of machinery and vehicles. Dust suppression measures must be implemented to prevent excessive dust on site. Due to the remote setting of the proposed mining area the potential impact of dust nuisance on the surrounding environment is deemed to be of low significance.

NOISE

The surrounding areas are characterised by an agricultural setting in which vehicles and farm equipment operate. The traffic on the N1 and other public roads surrounding the property contributes to the ambient noise of the area. The noise to be generated at the proposed quarry operation is expected to temporarily increase the noise levels of the area. Blasting noise will be instantaneous and of short duration occurring only twice a year. Loading and transportation of the material will generate noise daily. The significance of noise on the surrounding environment is therefore deemed to be of low significance. Mitigation measures must be implemented to ensure employees conduct them in an acceptable manner while on site in order to lessen the noise impact of the proposed activity on the surrounding environment.

CULTURAL AND HERITAGE ENVIRONMENT

HCAC was appointed to conduct a Heritage Impact Assessment for a proposed mining right application for the expansion of an existing quarry, Please refer to Appendix 14 for the specialist report. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the mining right footprint. Impacts from mining activities relating to the existing quarry occurred from the 1990's onwards, in addition the surrounding area was cultivated. These activities would have impacted on surface indicators of heritage sites and no archaeological sites or artefacts of significance were recorded during the survey. In terms of the palaeontological component the area is indicated as of insignificant sensitivity on the SAHRIS paleontological map and no further studies are required in this regard.

No further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed. In terms of the built environment of the area (Section 34), no structures older than 60 years occur in the study area. In terms of Section 36 of the Act no burial sites were recorded, however one stone cairn of unknown age and purpose was recorded. The cairn is possibly the result of clearing the fields for agricultural purposes but, although unlikely, the cairn could indicate an informal grave. No public monuments are located within or close to the study area. The study area is characterised by an existing quarry and associated infrastructure and the proposed development will not impact negatively on significant cultural landscapes or views capes. During the public participation process conducted for the project no heritage concerns was raised (HCAC, 2018).

The impact on heritage resources in the study area can be mitigated to an acceptable level and it is recommended that the proposed project can commence on the condition that the recommendations in this report are implemented as part of the EMPr and based on approval from SAHRA. Furthermore, the socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project (HCAC, 2018).

Final comment received from SAHRA (13 September 2018):

The author found no evidence of archaeological sites or artefacts of significance, structures older than 60 years, public monuments or burial sites; however, one stone cairn may, although unlikely, indicate an informal grave. The proposed area is indicated as of insignificant palaeontological sensitivity on the SAHRIS
paleontological map. The impact on heritage resources is therefore considered low.
The following recommendations are to be implemented as part of the EMPr:
•The stone cairn that may indicate a grave is to be preserved in-situ with a 20 meter buffer zone. If this is not possible, it must be proven that it is not a grave in which case no further actions are required.
•If any graves are located in future they should ideally be preserved in-situ or alternatively relocated according to existing legislation.
•Implementation of a chance find procedure.

EXISTING INFRASTRUCTURE

It is expected that the proposed processing activity will have a very low impact on the surrounding environment as activities will be contained within the boundaries of the site. The proposed footprint area will not require the building of any permanent structures. The proposed production of aggregate on the property will also reduce the amount of trucks delivering aggregate, from outside sources. This will have a direct positive impact on the traffic volumes of the surrounding roads and price of the aggregate.

B&E International (Pty) Ltd obtained a mining permit for the existing quarry area in 2012 with permit no 07/2012 and Mining Permit Reference Number FS 30/5/1/3/2/10001MP on the 13th of August 2012. The permit has been renewed for its 3rd renewal period on 10th November 2017 which expired on the 9th of November 2018. B&E International only commenced with the mining activities in August 2018, and therefore Inzalo Crushing and Aggregates applied for a Mining Right on 15 May 2018 in order for the Mining Right to be approved by the time that the mining permit (10001MP) expires and B&E International (the contractor for Inzalo Crushing and Aggregates) can continue with the quarrying process. The 300 days ended on the 21st of April 2019. The mining infrastructure that will be used

under the Mining Permit, will be the same infrastructure to be used during the mining right. Therefore, the mining equipment currently located on site, is to remain until the right has been granted. The decision in the infrastructure to remain until the mining right was made due to the fact that it is a costly process to remove the infrastructure from site, for such a short period. Therefore, Inzalo Crushing and Aggregates and B&E International has made the decision to keep the infrastructure on site as is should the right not get approved, the site will have to be fully rehabilitated by the contractor.

VISUAL EXPOSURE

The mining area was identified to constitute the lowest possible visual impact on the surrounding environment. The surrounding area has previously been disturbed by mining activities, and this application entails the extension of the existing mining area. The applicant must however ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the mine.

Upon closure the site will be rehabilitated and sloped to insure that the visual impact on the aesthetic value of the area is kept to a minimum. The site will have a neat appearance and be kept in good condition at all times.

ii) Finale Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers Attach as **Appendix**

Please refer to Appendix 6 for the final site map of the proposed Inzalo Bloemhof site. This map also indicates the site activities.

iii) Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;

The positive impacts associated with the project include:

- Work opportunities to thirty-eight workers;
- The site falls within an already disturbed area can be used for the establishment of the processing activities, and no riparian vegetation will be impacted on;
- Contribution to the construction industry that is an important economic sector in the Bloemhof area; and
- Opportunity for the landowner to diversify income on the property.

Associated Positive Impacts – Temporary Infrastructure:

- Low intensity site establishment;
- Easy movement of infrastructure as processing progress; and
- Complete removal of infrastructure at closure of the mine.

Additional negative impacts associated with the project that was deemed to have a Medium or Medium to High or higher significance/risk includes:

Disturbance of the geological strata	Medium - High
Loss and disturbance of surface archaeological sites	Medium
Noise nuisance	Medium
Dust nuisance	Medium
Deterioration of the visual aesthetics in the area	Medium
Alienation of animals and risk to avifauna	Medium
Potential compaction and contamination of soils	Medium
Contamination of area with hydrocarbons or hazardous waste materials	Medium

l) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

Management Objectives	Responsibility	Management Role
Visual Aspect	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.
Dust Handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.	• Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Add water sprayers to the crushing infrastructure to control dust emissions from conveyor belts.

Management Objectives	Responsibility	Management Role
	Compliance to be monitored by the Environmental Control Officer.	• Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.
Noise Handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• No crushing or screening allowed on Sundays. • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.
Management of weed/invader plants	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.
Topsoil management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Place topsoil stockpiles along the northern and western boundaries of the site. Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil.

Management Objectives	Responsibility	Management Role
		• Conduct the processing activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.
Protection of natural vegetation	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation.
Fauna Management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.
Waste management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Ensure no waste storage area is established outside the boundaries of the mining area. • Ensure vehicle maintenance only take place within the service bay area of the off-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litre closed container/bin inside the emergency service area. • Ensure diesel bowser is equipped with a drip tray at all times. • Use drip trays during each and every refuelling event. • Ensure the nozzle of the bowser rests in a sleeve to prevent dripping after refuelling. • Keep drip trays clean. No dirty drip trays may be used on site. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage

Management Objectives	Responsibility	Management Role
		together with the polluted soil and by disposing of them at a recognised facility. File proof on site. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Place all used oils, grease or hydraulic fluids therein and remove these receptacles from the site on a regular basis for disposal at a registered or licensed hazardous disposal facility. • Store non-biodegradable refuse such as glass bottles, plastic bags etc., in a container with a closable lid at a collecting point. Collection should take place on a regular basis and disposed of at the recognised landfill site. Prevent refuse from being dumped on or in the vicinity of the mining area. • Biodegradable refuse to be handled as indicated above. • generated at the site recording the amount of different types of waste generated by the mine in excel spreadsheet format.
Storm water management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Divert storm water around the processing and stockpile areas to prevent erosion. • Stockpile topsoil heaps along the northern and western boundaries of the study area to divert runoff water away from the processing area. • Weekly monitor the stockpiles and if any signs of erosion become apparent implement soil erosion protection measures. • Continuously monitor the effectiveness of the storm water infrastructure. • Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS.
Management of access roads	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr Compliance to be monitored by the Environmental Control Officer.	• Divert storm water around the access roads to prevent erosion. • Repair rutting and erosion of the access roads caused by the proposed activities. • Maintain newly constructed access roads so as to minimise dust, erosion or undue surface damage. • Erosion of access road: Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas.

Management Objectives	Responsibility	Management Role
After care on rehabilitated areas	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	• Control run-off water via temporary banks to ensure that accumulation of run-off does not cause down-slope erosion. • Only do topsoil spreading 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 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. • Plant a cover crop immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. Fertilize the cover crop for optimum production. • Ensure rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation must not be considered complete until the first cover crop is well established. • Monitor all rehabilitated areas for erosion, and appropriately stabilized if any erosion occurs.
Management of health and safety risks	Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer. Blasting contractor to comply with national blasting requirements.	• Plan the type, duration and timing of the blasting procedures with due cognisance of other land users and structures in the vicinity, • Inform the surrounding landowners and communities of any blasting event, - All nearby businesses, communities or any effected party must be notified of blasting times and regulations put in place by the company responsible for the blasting operations. This must be done by means of signs and delivered printed procedure to all communities. • The blasting contractor should assist with evacuating communities which need assistance • The blasting contractor should record ensure a legislative legal risk assessment is conducted. • Use soft explosives during blasting, • Limit fly rock, • Give audible warning of a pending blast at least 3 minutes in advance of the blast, • Remove all fly rock (of diameter 150mm and larger) which falls beyond the working area, together with the rock spill.

Management Objectives	Responsibility	Management Role
		▪ Ensure that workers have access to the correct PPE as required by law. ▪ Ensure all operations comply with the Occupational Health and Safety Act. ▪ Eskom must be notified if any blasting will influence their utilities for example, power line that is within 250m or 500m from the Quarry, a risk assessment and procedure will be given to Eskom and these documents will address how these blasting operations will be done safely.
Protection of Cultural or Heritage Artefacts	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	▪ Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. ▪ Notify Heritage and the ECO immediately.
Handling of Hazardous Materials and Substance	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer	▪ Store all hazardous materials or substances in a closed storage facility with an impermeable floor. ▪ Storage area to meet the following conditions: ▪ Construct storage area on a level area. ▪ Floor of the storage area should be impermeable. ▪ Storage area should be outside the 1:100-year flood line or further than 100m from the edge of a watercourse, whichever is greatest. ▪ Access to the materials/substances may only take place with the prior notification of the site manager. ▪ Fuel storage tanks should have an impermeable bund wall and base within which the tanks sits, raised above the floor, on plinths. The bund capacity should be sufficient to contain 110% of the tank's maximum capacity. ▪ Consider the distance and height of the bund wall relative to that of the tank to ensure that oil does not spout beyond the confines of the bund. ▪ Establish a formal inspection routine to check all equipment in the bund area, as well as the bund area itself for malfunctions or leakages. Inspection should be at least weekly and any accumulated rainwater should be removed.

Management Objectives	Responsibility	Management Role
		▪ All valves and outlets should be checked to ensure that they are intact and closed securely. ▪ Slope the bund base towards a rainwater sump of sufficient size. ▪ Contain contaminated water until it can be collected by a registered hazardous waste handling contractor or be disposed of at a registered hazardous waste handling facility. ▪ Ensure availability of drip trays underneath all stationary equipment or vehicles.
Topsoil handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer.	▪ Remove the first 300 mm of topsoil in strips and store along the boundary of the site. ▪ Keep the temporary topsoil stockpiles free of weeds. ▪ Place topsoil stockpiles on a levelled area and implement measures to safeguard the piles from being washed away in the event of heavy rains/storm water. ▪ Topsoil heaps should not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen. ▪ Seed the stockpiled topsoil heaps if vegetation does not re-establish within 6 months of mining. ▪ Divert storm- and runoff water around the stockpile area and access roads to prevent erosion.
Blast Monitoring	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Monitoring to be conducted by blasting contractor. Compliance to be monitored by the Environmental Control Officer.	▪ Monitor ground vibration and air blast levels to USBM standards.
Fauna and Flora	Site Manager to ensure compliance	▪ Ensure no fauna is caught, killed, harmed, sold or played with.

Management Objectives	Responsibility	Management Role
	with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer.	▪ Instruct workers to report any animals that may be trapped in the working area. ▪ Ensure no snares are set or nests raided for eggs or young. ▪ Do not remove plants or trees without the approval of the ECO.

m) Final proposed alternatives.

(provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

As explained under point *g) Motivation for preferred development footprint* the initial proposal was updated to incorporate the matters raised during the assessment process. This lead to the final layout of infrastructure and activities on the overall site as shown in the final site map attached Appendix 6.

- The establishment of the processing area using temporary infrastructure.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

The management objectives listed in this report under *Point L Proposed impact management objectives* above must be considered for inclusion in the environmental authorisation.

Additional conditions will be included into this section in the FEIAR document if any are received by the specialist.

o) Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

The assumptions made in this document which relate to the assessment and mitigation measures proposed, stem from site specific information gathered from the property owner, as well as site inspections, and background information gathering. No uncertainty with regard to the proposed project or the receiving environment could be identified.

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

i) Reasons why the activity should be authorized or not.

Should the mitigation measures and monitoring programmes proposed in this document be implemented on site, no fatal flaws could at this point and time be identified that were deemed as severe as to prevent the activity continuing.

ii) Conditions that must be included in the authorisation

(1) Specific conditions to be included into the compilation and approval of EMPr

The management objectives listed in this report under *Point L Proposed impact management objectives* and listed below must be included into the compilation and approval of the EMPr:

- Visual Aspect;
- Dust Handling;
- Noise Handling;
- Management of weed/invader plants;
- Topsoil Management;
- Protection of Natural Vegetation;
- Fauna Management;
- Waste Management;
- Storm Water Management;
- Management of Access Roads;
- After Care on Rehabilitated Areas;
- Health and Safety Risks; and
- Protection of Cultural of Heritage Artefacts.

(2) Rehabilitation requirements

The applicant must adhere to the following rehabilitation requirements:

The objective of the rehabilitation plan is to ensure that:

a) the areas disturbed by the prospecting and mining activities are rehabilitated and/or landscaped;

b) that the site and areas disturbed by prospecting and mining activities are visually appealing and are left in a neat and tidy condition;
c) contaminants/pollution sources are removed from the site or that appropriate measures are in place to control long-term contamination sources;
d) the site and surrounding disturbed areas are in a stable condition.

Listed below are the provisional requirements for rehabilitation of the site. These are intended as a guideline.

Actions to clear the site:

1. Remove all containers and temporary office structures from the site.
2. Drain all pollution sumps and dispose of all solid and liquid waste at a permitted landfill site.
3. Break up all concrete structures, cart concrete from the site and dispose of at a permitted landfill site.
4. Collect all litter and packaging from within the site as well as the peripheral areas and dispose at a permitted landfill site.
5. Remove all waste building components/parts from the site (whether scrap or not) including metal, wood, drums, plastic, cabling, tubing, etc.
6. Ensure that no waste is buried on site.
7. Disconnect all temporary power, water and sewerage connections.
8. Disassemble and remove all ablution facilities.
9. Ensure that all infrastructure routes are rehabilitated and stable.
10. Clear weeds from the construction site and peripheral disturbed areas.
11. Clear all litter and rubble from drainage lines and disposes of appropriately.
12. Ensure that all public roads are satisfactorily cleared of rubble
13. Repair damaged road curbs or other structures (Preez, July 2018)

Rehabilitation of the excavated area:

- Due to the impracticality of importing large volumes of fill to restore the quarry area to its original topography, the rehabilitation option is to develop the quarry into a minor 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 slopes on the benches below, thereby reducing the overall face angle.

- Fill and topsoil could be placed over the benches to provide a suitable medium for the establishment of vegetation, especially trees which will break up the line of the faces and enhance their appearance. The floor of the quarry must be capped with suitable soil material and re-vegetated.
- Rocks and coarse material removed from the excavation must be dumped into the excavation.
- No waste will be permitted to be deposited in the excavations.
- Once overburden, rocks and coarse natural materials has been dumped into the excavated area and profiled with acceptable contours and erosion control measures, topsoil shall be returned over the area.
- The area shall be fertilized to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.
- 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.

Rehabilitation of plant, office and service areas:

- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- Stockpiles will be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium.
- On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):
    - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
    - Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.
    - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- Photographs of the camp and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.
- Prior to replacing the topsoil, the material that was removed from these areas will be replaced in the same order as it originally occurred.
- The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- 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 seed mix to his or her specification.

Final rehabilitation:

- Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding and maintenance, and weed / alien clearing.
- All infrastructures, equipment, plant, temporary housing and other items used during the mining period will be removed from the site.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.
- Weed / Alien clearing will be done in a sporadic manner during the life of the mining activities. Species regarded as Category 1 weeds according to CARA (Conservation of Agricultural Recourses Act, 1983 – Act 43; Regulations 15 & 16 (as amended in March 2001) need to be eradicated from the site on final closure.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.
- Seeding of the area:
    - Once the pit slopes have been shaped and the soil replaced, the initial goal is to establish a good cover of a robust grass that will stabilise the soil and start the accumulation of soil organic carbon. This will be done using a combination of hydro seeding and physical planting of runners to apply a mix of commercial and indigenous species that includes both tufted and creeping species. The plants that were collected during the establishment and operational phases and kept in the designated area will be replanted.

- Backfill all remaining voids or if not possible blast steps of 2 m high x 3 m wide to make the steep cliffs safer.
- Flatten the heaps of over burden that remains after all voids have been filled
- Remove all stockpiled rubble from the site and dispose of at a permitted disposal site
- Ensure that no bare, unvegetated areas remain.
- Rehabilitate (rip and hydro seed) all disused compacted surfaces, tracks and roads
- Make provision for the rehabilitation of peripheral areas not directly included within the site that were disturbed during the construction process. Rehabilitation may entail grading, levelling, fertilizing and re-grassing.
- Identify actual and potential erosion sites and implement measures for control/prevention of erosion. Ensure that appropriate erosion control measures are installed around storm water outlets and stabilise and re-grass areas around storm water outlets with indigenous species.
- Stabilise the watercourse banks and re-grassing to prevent erosion
- Where possible indigenous plants must be used as part of the landscaping process.
- The Landscape Contractor is to ensure that adequate planting of indigenous plants is catered for. The ECO is to review and approve the landscaping plans.
- It is recommended that efforts on invasive species management, erosion control and rehabilitation is coordinated to avoid negative effects of one development on the environmental state on and around the other (Preez, July 2018).

q) Period for which the Environmental Authorisation is required.

The applicant requests the Environmental Authorisation to be valid for a 20-year period in order to correspond with the validity of the mining right.

r) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

The undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Environmental Impact Assessment Report and the Environmental Management Programme report.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

The amount that will be necessary for the rehabilitation of damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum total of R 3 943 679.55.

i) Explain how the aforesaid amount was derived.

The financial provision calculation for the mining right application (FS 30/5/1/3/2/10045 MR) (25.4ha) was calculated at **R 3 943 679.55.** This calculation includes the rehabilitation of the 25.4ha mining area.

Please see the explanation as to how this amount was derived at attached as Appendix 14. A Bank Guarantee will be provided for the proposed site.

ii) Confirm that this amount can be provided for from operating expenditure.

(Confirm that the amount is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

The processing operation will be self-funded through income generated by sales of the aggregate, and will therefore be funded by Inzalo Crushing and Aggregates (Pty) Ltd.

t) Deviations from the approved scoping report and plan of study.

i) Deviations from the methodology used in determining the significance of potential environmental impacts and risks.

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation).

No deviation from the methodology used in determining the significance of potential environmental impacts and risks were deemed necessary. The methodology described in the Scoping Report was also used in the Environmental Impact Assessment Report.

ii) Motivation for the deviation.

N/A

u) Other Information required by the competent Authority

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

(1) Impact on the socio-economic conditions of any directly affected person.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 219.1** and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herin).

The following potential impacts were identified that may impact on socio-economic conditions of directly affected persons:

Visual exposure:

The mining area was identified to constitute the lowest possible visual impact on the surrounding environment. The surrounding areas have previously been disturbed by mining activities, and this application entails the extension of the existing mining areas. The applicant should however ensure that housekeeping is managed to standard, as this will mitigate the visual impacts during the operational phase of the mine.

Upon closure the site will be rehabilitated and sloped to insure that the visual impact on the aesthetic value of the area is kept to a minimum. The site will have a neat appearance and be kept in good condition at all times.

This impact could be managed through the implementation of mitigation measures and needs to be fully investigated during the environmental impact assessment process.The findings of the investigation will be included in the Final EIA report.

Air Quality:

The background air quality of the surrounding area is relatively good due to low industrial activity. Factors contributing to air pollution are the burning of veld and agriculture in the area. Given the surrounding extent of mostly covered areas, no extreme dust generation under windy conditions is experienced.

Dust will be generated by the proposed operation through blasting (limited to one blast) and the movement of machinery and vehicles. Dust suppression measures should be implemented to prevent excessive dust on site. Due to the remote setting of the proposed mining area the potential impact of dust nuisance on the surrounding environment is deemed to be of low significance.

Noise:

The surrounding areas are characterised by an agricultural setting in which vehicles and farm equipment operate. The traffic on the N1 and other public roads surrounding the property contributes to the ambient noise of the area. The noise to be generated at the proposed site (site alternative 1) operation is expected to temporarily increase the noise levels of the area. Blasting noise will be instantaneous and of short duration.

Loading and transportation of the material will generate noise daily. The significance of noise on the surrounding environment is therefore deemed to be of low significance.

Mitigation measures should be implemented to ensure employees conduct them in an acceptable manner while on site in order to lessen the noise impact of the proposed activity on the surrounding environment.

Existing Infrastructure:

It is expected that the proposed processing activity will have a very low impact on the surrounding environment as activities will be contained within the boundaries of the site. The proposed (Site alternative 1) footprint area will not require the building of any permanent structures. The proposed production of aggregate on the property will also reduce the amount of trucks delivering aggregate, from outside sources. This will have a direct positive impact on the traffic volumes of the surrounding roads and price of the aggregate.

B&E International (Pty) Ltd obtained a mining permit for the existing quarry area in 2012 with permit no 07/2012 and Mining Permit Reference Number FS 30/5/1/3/2/10001MP on the 13th of August 2012. The permit has been renewed for its 3rd renewal period on 10th November 2017 which expired on the 9th of November 2018. B&E International only commenced with the mining activities in August 2018, and therefore Inzalo Crushing and Aggregates applied for a Mining Right on 15 May 2018 in order for the Mining Right to be approved by the time that the mining permit (10001MP) expires and B&E International (the contractor for Inzalo Crushing and Aggregates) can continue with the quarrying process. The 300 days ended on the 21st of April 2019. The mining infrastructure that will be used under the Mining Permit, will be the same infrastructure to be used during the mining right. Therefore, the mining equipment currently located on site, is to remain until the right has been granted. The

decision in the infrastructure to remain until the mining right was made due to the fact that it is a costly process to remove the infrastructure from site, for such a short period. Therefore, Inzalo Crushing and Aggregates and B&E International has made the decision to keep the infrastructure on site as is should the right not get approved, the site will have to be fully rehabilitated by the contractor.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No 25 of 1999) with the exception of the national estate contemplated in section 3(2)(*i*)(*vi*) and (*vii*) of that Act, attach the investigation report as **Appendix 219.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 herein)..

HCAC was appointed to conduct a Heritage Impact Assessment for a proposed mining right application for the expansion of an existing quarry, Please refer to Appendix 14 for the specialist report. The study area was assessed both on desktop level and by a field survey. The field survey was conducted as a non-intrusive pedestrian survey to cover the extent of the mining right footprint. Impacts from mining activities relating to the existing quarry occurred from the 1990's onwards, in addition the surrounding area was cultivated. These activities would have impacted on surface indicators of heritage sites and no archaeological sites or artefacts of significance were recorded during the survey. In terms of the palaeontological component the area is indicated as of insignificant sensitivity on the SAHRIS paleontological map and no further studies are required in this regard.
No further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed. In terms of the built environment of the area (Section 34), no structures older than 60 years occur in the study area. In terms of Section 36 of the Act no burial sites were recorded, however one stone cairn of unknown age and purpose was recorded.
The cairn is possibly the result of clearing the fields for agricultural purposes but, although unlikely, the cairn could indicate an informal grave. No public monuments are located within or close to the study area. The study area is characterised by an existing quarry and associated infrastructure and the proposed development will not impact negatively on significant cultural landscapes or views capes. During the public participation process conducted for the project no heritage concerns was raised (HCAC, 2018).

The impact on heritage resources in the study area can be mitigated to an acceptable level and it is recommended that the proposed project can commence on the condition that the recommendations in this report are implemented as part of the EMPr and based on approval from SAHRA. Furthermore,

the socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project (HCAC, 2018).

Inzalo Crushing and Aggregates (Pty) Ltd will make use of temporary infrastructure during the mining operations. Workers will be transported to and from the site daily. The footprint of the exsting quary fallls over a area previously used for mining. The proposed opening of the site was extended to SAHRIS for the significant heritage overview of the site.

v) Other matter required in terms of section 24(4)(a) and (b) of the Act.

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives as contemplated in sub-regulation 22(2)(h), exist the EAP must attach such motivation as **Appendix 4)**

The site and project alternatives investigated during the impact assessment process were done at the hand of information obtained during the site investigation, public participation process as well as desktop studies conducted of the study area. As discussed earlier the following alternatives were considered:

1. Site Alternative 1 – The proposed mining area over a 25.4 ha footprint area (Preferred Alternative).
2. Site Alternative 2 – The proposed mining area over a 25.4 ha footprint area.
3. No-go Alternative

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1. Final environmental management programme.

a) Details of the EAP, (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

The details and expertise of Yolandie Coetzee of Greenmined Environmental that acts as EAP on this project has been included in Part A Section 1(a) as well as Appendix 1 as required.

b) Description of the Aspects of the Activity (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required)

The aspects of the activity that are covered by the final environmental management programme has been described and included in Part A, section (1)(h).

c) Composite Map

(Provide a map (**Attached as an Appendix**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers)

As mentioned under Part A, section (1)(L)(ii) this map has been compiled and is attached as Appendix 6 to this document.

d) Description of Impact management objectives including management statements

i) Determination of closure objectives. (ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The objective of the rehabilitation plan is to ensure that:

a) the areas disturbed by the prospecting and mining activities are rehabilitated and/or landscaped;
b) that the site and areas disturbed by prospecting and mining activities are visually appealing and are left in a neat and tidy condition;
c) contaminants/pollution sources are removed from the site or that appropriate measures are in place to control long-term contamination sources;

d) the site and surrounding disturbed areas are in a stable condition.

Listed below are the provisional requirements for rehabilitation of the site. These are intended as a guideline.

Actions to clear the site:

1. Remove all containers and temporary office structures from the site.
2. Drain all pollution sumps and dispose of all solid and liquid waste at a permitted landfill site.
3. Break up all concrete structures, cart concrete from the site and dispose of at a permitted landfill site.
4. Collect all litter and packaging from within the site as well as the peripheral areas and dispose at a permitted landfill site.
5. Remove all waste building components/parts from the site (whether scrap or not) including metal, wood, drums, plastic, cabling, tubing, etc.
6. Ensure that no waste is buried on site.
7. Disconnect all temporary power, water and sewerage connections.
8. Disassemble and remove all ablution facilities.
9. Ensure that all infrastructure routes are rehabilitated and stable.
10. Clear weeds from the construction site and peripheral disturbed areas.
11. Clear all litter and rubble from drainage lines and disposes of appropriately.
12. Ensure that all public roads are satisfactorily cleared of rubble
13. Repair damaged road curbs or other structures

Landscape the mine site:

1. Backfill all remaining voids or if not possible blast steps of 2 m high x 3 m wide to make the steep cliffs safer.
2. Flatten the heaps of over burden that remains after all voids have been filled
3. Remove all stockpiled rubble from the site and dispose of at a permitted disposal site
4. Ensure that no bare, unvegetated areas remain.
5. Rehabilitate (rip and hydro seed) all disused compacted surfaces, tracks and roads
6. Make provision for the rehabilitation of peripheral areas not directly included within the site that were disturbed during the construction process. Rehabilitation may entail grading, levelling, fertilizing and re-grassing.

7. Identify actual and potential erosion sites and implement measures for control/prevention of erosion. Ensure that appropriate erosion control measures are installed around storm water outlets and stabilise and re-grass areas around storm water outlets with indigenous species.
8. Stabilise the watercourse banks and re-grassing to prevent erosion
9. Where possible indigenous plants must be used as part of the landscaping process.
10. The Landscape Contractor is to ensure that adequate planting of indigenous plants is catered for. The ECO is to review and approve the landscaping plans.
11. It is recommended that efforts on invasive species management, erosion control and rehabilitation is coordinated to avoid negative effects of one development on the environmental state on and around the other (Preez, July 2018).

Rehabilitation of the excavated area:

Due to the impracticality of importing large volumes of fill to restore the quarry area to its original topography, the rehabilitation option is to develop the quarry into a minor 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 slopes on the benches below, thereby reducing the overall face angle.

Fill and topsoil could be placed over the benches to provide a suitable medium for the establishment of vegetation, especially trees which will break up the line of the faces and enhance their appearance. The floor of the quarry must be capped with suitable soil material and re-vegetated.

Rocks and coarse material removed from the excavation must be dumped into the excavation.

No waste will be permitted to be deposited in the excavations. Once overburden, rocks and coarse natural materials has been dumped into the excavated area and profiled with acceptable contours and erosion control measures, topsoil shall be returned over the area.

The area shall be fertilized to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora. 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.

Rehabilitation of plant, office and service areas:

Coarse natural material used for the construction of ramps must be removed and dumped into the excavations. Stockpiles will be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium. On completion of operations, all structures or objects shall be dealt with in accordance with Section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002):

- Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10 cm above the surrounding ground surface.
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

Photographs of the camp and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200 mm and graded to an even surface condition. Where applicable/possible topsoil needs to be returned to its original depth over the area.

Prior to replacing the topsoil, the material that was removed from these areas will be replaced in the same order as it originally occurred. The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.

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 seed mix to his or her specification.

Final rehabilitation:

Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding and maintenance, and weed / alien clearing.

All infrastructures, equipment, plant, temporary housing and other items used during the mining period will be removed from the site.

Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.

Weed / Alien clearing will be done in a sporadic manner during the life of the mining activities. Species regarded as the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure. Final rehabilitation shall be completed within a period specified by the Regional Manager.

Seeding of the area:

Once the pit slopes have been shaped and the soil replaced, the initial goal is to establish a good cover of a robust grass that will stabilise the soil and start the accumulation of soil organic carbon. This will be done using a combination of hydro seeding and physical planting of runners to apply a mix of commercial and indigenous species that includes both tufted and creeping species. The plants that were collected during the establishment and operational phases and kept in the designated area will be replanted.

ii) The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.

Due to the nature of the proposed processing activity, it is believed that the risk of environmental damage or pollution is of low significance. If site management implement the mitigation measures as prescribed in this document, it is believed that the impact on the receiving environment can be adequately controlled.

iii) Potential risk of Acid Mine Drainage. (Indicate whether or not the mining can result in acid mine drainage).

No acid mine drainage is expected. Therefore, not applicable.

iv) Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.

No acid mine drainage is expected. Therefore, not applicable.

v) Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.

No acid mine drainage is expected. Therefore, not applicable.

vi) Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.

No acid mine drainage is expected. Therefore, not applicable.

vii) Volumes and rate of water use required for the mining, trenching or bulk sampling operation.

Water will be transported to the site on a daily basis. Water in the existing quarry will be pumped out of the quarry and reused for mineral processing and dust suppression purposes. A water truck will be used to spray access roads to alleviate dust generation. 3960 m³ per annum will be abstracted for dust suppression on site from the quarry pit.

viii) Has a water use license been applied for?

The applicant has applied for a General Authorisation for the water uses that is applicable to the project. Application will need to be made for the following activities:

WATER USE	PURPOSE / DESCRIPTION
Section 21 (a)	Taking water from a water resource – Bloemhof Quarry Pit @ 3960 m³ per annum; Dust suppression
Section 21 (j)	Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people - *Quarry*

ix) Impacts to be mitigated in their respective phases

Measures to rehabilitate the environment affected by the undertaking of any listed activity

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
whether listed or not listed	(volumes, tonnages and hectares or m^2)	In which impact is anticipated			
As listed in 2.11.1		(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))			
DEMARCATION OF SITE WITH VISIBLE BEACONS.	25,4 ha	Construction / Site Establishment phase	Demarcation of the site will ensure that all employees are aware of the boundaries of the processing area and that work stay within approved area.	Processing of the waste rock/stone is only allowed within the boundaries of the approved processing area. • MHSA, 1996 • OHSA, 1993	Beacons need to be in place throughout the life of the activity.
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE	±120 000 m^2	Construction / Site Establishment phase	N/A	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	Construction / Site Establishment phase
			Portable toilets are to be emptied and cleaned regularly. Ensure reputable contractors are utilize for management of facilities. Portable toilets will be managed by a reputable contractor and inspected daily for any potential leaks. Water should not be released into the surrounding environment unless relevant permission obtained from DWS	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	Construction / Site Establishment phase

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	±120 000 m^2	Operational phase	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational phase
			Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40 km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits • Roads will be sprayed with water regularly, especially during times of high dust generation.	Dust Handling: • NEM: AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
			Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	±120 000 m²	Operational phase	**Noise Handling:** • The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. • Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. • Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	**Noise Handling:** • NEM: AQA, 2004 Regulation 6(1) • All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
			• Ensure permits are obtained to remove protected species. • Relocate all protected species with aid of specialists. • Only remove species in areas designated for activity and do not disturb surrounding areas. • Plan activities carefully so that only vegetation that needs to be impacted is impacted. • Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. • Limit activity to area of disturbance and revegetated impacted areas as soon as possible. • Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated 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 with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	<u>Management of weed- or invader plants</u>: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. <u>Negative impact on biodiversity of the area (Site Alternative 1):</u> NEM:BA, 2004	Throughout operational and decommissioning phases
ESTABLISHMENT OF TEMPORARY BUILDINGS	±120 000 m²	Operational phase	• Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination.	<u>Loss of topsoil due to incorrect storm water management:</u> • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014	Throughout operational phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. • Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. • Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: • Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must 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. • Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). • The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	• The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. <u>Loss of soil due to un- vegetated areas:</u> • NEMBA (Act No. 10 of 2004). • NEMA, 1998 • Bare areas need to be re-vegetation to prevent soil erosion.	

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	±120 000 m^2	Operational phase	• Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> • NWA, 1998 • NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
			Keep mining in footprint		Throughout operational and decommissioning phases
			Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. Should graves be observed on site during activity progress then all activity should be ceased and the area demarcated as a no-go zone. A specialists will need to be consulted and responsible action considered, whether grave relocation or ceasing activity	<u>Loss of Artefacts and Graves:</u> National Heritage Resources Act No. 25 of 1999	Throughout operational and decommissioning phases
			• Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. Any leakages should be reported and treated immediately in a reputable manner. • For large spills Hazmat will called in. • All leaks will be cleaned up immediately using an absorbent material. • Rigs will be regularly serviced to reduce risk of leaks. • Pans will be placed under potential leak sites. • Any leakages should be reported and treated as per the emergency response plan. Utilize water on site responsibly. • Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. • Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination.	Contamination of surface or groundwater due to hazardous spills not cleaned	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. • Bunded area will have adequate capacity to capacity to contain leaks. • Large leaks will be cleared by reputable oil recycling company.		
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	±120 000 m^2	Operational phase	• Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. • Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. • Ensure water management facilities are operating adequately. Clean out silt build up over dry season. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	NWA, 1998	Throughout operational and decommissioning phases
			• Inform staff, contractors and visitors to not harm fauna in the area. • Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. • Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. • Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Conduct annual surveys to monitor faunal biodiversity. • Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	<u>Negative impact on fauna that may enter the area:</u> • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases
ESTABLISHMENT OF TEMPORARY	±120 000 m^2	Construction / Site Establishment phase	• Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. • Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			Ensure advertising is limited to local and regional areas, and only specifically advertise for Jobs nationally if skills are not available. Ensure that all power-related structures are adequately marked with relevant signs and warnings and fenced off.	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	Construction / Site Establishment phase
STRIPPING AND STOCKPILING OF TOPSOIL	25,4 ha	Operational phase	<u>Visual Mitigation:</u> • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	<u>Land use zoning:</u> • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational phase
			<u>Dust Handling:</u> • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40 km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits • Roads will be sprayed with water regularly, especially during times of high dust generation.	<u>Dust Handling:</u> • NEM: AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
STRIPPING AND STOCKPILING OF TOPSOIL	25,4 ha	Operational phase	**<u>Emission Handling:</u>** All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	<u>Dust Handling:</u> NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
			<u>Noise Handling:</u> • The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area.	**<u>Noise Handling:</u>** • NEM: AQA, 2004 Regulation 6(1) • All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. • Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. • Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.		
			• Ensure permits are obtained to remove protected species. • Relocate all protected species with aid of specialists. • Only remove species in areas designated for activity and do not disturb surrounding areas. • Plan activities carefully so that only vegetation that needs to be impacted is impacted. • Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. • Limit activity to area of disturbance and revegetated impacted areas as soon as possible. • Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated 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 with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	<u>Management of weed- or invader plants</u>: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. <u>Negative impact on biodiversity of the area (Site Alternative 1):</u> NEM:BA, 2004	Throughout operational and decommissioning phases
STRIPPING AND STOCKPILING OF TOPSOIL	25,4 ha	Operational phase	• Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles.	<u>Loss of topsoil due to incorrect storm water management:</u> • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. <u>Loss of soil due to un- vegetated areas:</u> • NEMBA (Act No. 10 of 2004).	Throughout operational phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. • Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: • Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must 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. • Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). • The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	• NEMA, 1998 • Bare areas need to be re-vegetation to prevent soil erosion.	
STRIPPING AND STOCKPILING OF TOPSOIL	25.4ha	Operational phase	• Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility.	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> • NWA, 1998 • NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.		
			Keep mining in footprint		Throughout operational and decommissioning phases
			Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. Should graves be observed on site during activity progress then all activity should be ceased and the area demarcated as a no-go zone. A specialists will need to be consulted and responsible action considered, whether grave relocation or ceasing activity	<u>Loss of Artefacts and Graves:</u> National Heritage Resources Act No. 25 of 1999	Throughout operational and decommissioning phases
			• Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. • For large spills Hazmat will called in. • All leaks will be cleaned up immediately using an absorbent material. • Rigs will be regularly serviced to reduce risk of leaks. • Pans will be placed under potential leak sites. • Any leakages should be reported and treated as per the emergency response plan. • Utilize water on site responsibly. • Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. • Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. • Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. • Bunded area will have adequate capacity to capacity to contain leaks. • Large leaks will be cleared by reputable oil recycling company.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
STRIPPING AND STOCKPILING OF TOPSOIL	25,4 ha	Operational phase	• Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. • Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. • Ensure water management facilities are operating adequately. Clean out silt build up over dry season. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	NWA, 1998	Throughout operational and decommissioning phases
			• Inform staff, contractors and visitors to not harm fauna in the area. • Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. • Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. • Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Conduct annual surveys to monitor faunal biodiversity. • Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	<u>Negative impact on fauna that may enter the area:</u> • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases
STRIPPING AND STOCKPILING OF	25,4 ha	Operational phase	• Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. • Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
DRILLING AND BLASTING	10 ha	Operational phase	<u>Visual Mitigation:</u> • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status.	<u>Land use zoning:</u> • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational and decommissioning phases

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			Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.		
			Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40 km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits • Roads will be sprayed with water regularly, especially during times of high dust generation.	Dust Handling: NEM: AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
			Blasting alternatives will be considered to reduce noise and associated vibrations	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
DRILLING AND BLASTING	10ha	Operational phase	Any activities that take place within 32 meters of a wetland or watercourse or the 1:100 year flood lines will require authorisation in terms of the relevant regulations of NEMA, however as far as possible infrastructure should be placed outside of wetlands and / or buffer lines. · No stockpiling should take place within a watercourse or the 32m buffer. · All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds · Erosion and sedimentation into channels must be minimised through the effective stabilisation (gabions and Reno mattresses) and the re-vegetation of any disturbed stream banks; · Ensure that erosion management and sediment controls are strictly	NWA, 1998	Throughout operational and decommissioning phases

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			implemented from the beginning of site clearing activities, particularly as the soils in the study area are prone to erosion; · All areas should be re-sloped and top-soiled where necessary and reseeded with indigenous grasses to stabilise the loose material; · Edge effects such as erosion must be strictly monitored and managed; · A sensitivity map has been developed for the study area, indicating the drainage lines and riparian systems, and their relevant buffer zones. It is recommended that this sensitivity map be considered during all phases of the development and with special mentioning of the planning of infrastructure, in order to aid in the conservation of and minimise impact on the riparian and aquatic habitat and resources within the study area; · Rehabilitation must ensure that the wetland structure and function are reinstated in such a way as to ensure the ongoing functionality of the larger wetland systems at pre-mining levels. · Any areas where bank failure is observed, due to the prospecting or mining impacts, should be immediately repaired; · As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. Should temporary roads or access routes be necessary and unavoidable, proper planning must take place and the site sensitivity plan must be taken into consideration. If additional roads are required, then wherever feasible such roads should be constructed a distance from the more sensitive riparian areas and not directly adjacent thereto. If crossings are required they should cross the systems at right angles, as far as possible to minimise impacts in the receiving environment; · The duration of impacts on the drainage line should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised; · Stabilisation of banks by employing one of the individual techniques below or		

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			a combination thereof, is essential, given the inherent susceptibility of the soils to erosion. Such measures include: o Re-sloping of banks to a maximum of a 1:3 slope; o Revegetation of re-profiled slopes; o Temporary stabilisation of slopes using geotextiles; and o Installation of gabions and reno-mattresses. o To prevent the further erosion of soils, management measures may include berms, soil traps, hessian curtains and storm water diversion away from areas particularly susceptible to erosion; · Install erosion berms during construction to prevent gully formation: o Berms every 50m should be installed where any disturbed soils have a slope of less than 2%, o Berms every 25m where the track slopes between 2% and 10%, 8 o Berms every 20m where the track slopes between 10% and 15% and o Berms every 10m where the track slope is greater than 15%; · Sheet runoff from access roads should be slowed down by the strategic placement of berms and/or sandbags; · All soils compacted as a result of construction activities falling outside of project areas should be ripped and profiled. Special attention should be paid to alien and invasive control within these areas. Alien and invasive vegetation control should take place throughout all construction and rehabilitation phases to prevent loss of floral habitat; · As far as possible, all rehabilitation activities should occur in the low flow season, during the drier winter months. · Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench. All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent entry of hydrocarbons into topsoil and groundwater; · All spills, should they occur, should be immediately cleaned up and treated accordingly. · Chemicals used for mining, vehicle maintenance and construction must be stored safely on site but outside the 32m buffer and surrounded by bunds. Chemical storage containers must be regularly inspected so that any leaks are detected early.		

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			· Littering and contamination of water sources during mining must be prevented by effective site management. · Emergency plans must be in place in case of spillages especially in the watercourse. · No stockpiling should take place within a watercourse. · All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. · Stockpiles must be located away from river channels. · Erosion and sedimentation into channels must be minimised through the effective stabilisation (gabions and Reno mattresses) and the re-vegetation of any disturbed riverbanks. · The construction camp and necessary ablution facilities meant for construction workers must be beyond the 32m buffer described previously.		
DRILLING AND BLASTING	10ha	Operational phase	As far as possible, all rehabilitation activities should occur in the low flow season, during the drier winter months. · Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench. · The duration of impacts on the riverine and drainage line systems should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised; · Rehabilitation must ensure that riparian structure and function are reinstated in such a way as to ensure the ongoing functionality of the larger riparian systems at premining levels. · Stabilisation of banks by employing one of the individual techniques below or a combination thereof, is essential, given the inherent susceptibility of the soils to erosion. Such measures include: o Re-sloping of banks to a maximum of a 1:3 slope; o Revegetation of re-profiled slopes; o Temporary stabilisation of slopes using geotextiles; and o Installation of gabions and reno-mattresses. o To prevent the further erosion of soils, management measures may include berms, soil traps, hessian curtains and storm water diversion away from areas particularly susceptible to erosion;	NWA, 1998	Throughout operational and decommissioning phases

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			· Install erosion berms during construction to prevent gully formation: o Berms every 50m should be installed where any disturbed soils have a slope of less than 2%, o Berms every 25m where the track slopes between 2% and 10%, o Berms every 20m where the track slopes between 10% and 15% and o Berms every 10m where the track slope is greater than 15%;		
DRILLING AND BLASTING	10 ha	Operational phase	• Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. • Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. • Ensure water management facilities are operating adequately. Clean out silt build up over dry season. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	NWA, 1998	Throughout operational and decommissioning phases
			• Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. • For large spills Hazmat will called in. • All leaks will be cleaned up immediately using an absorbent material. • Rigs will be regularly serviced to reduce risk of leaks. • Pans will be placed under potential leak sites. • Any leakages should be reported and treated as per the emergency response plan. • Utilize water on site responsibly. • Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. • Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. • Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. • Bunded area will have adequate capacity to capacity to contain leaks. • Large leaks will be cleared by reputable oil recycling company.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases
			• Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants.	<u>Loss of topsoil due to incorrect storm water management:</u> • NEMA, 1998 • NWA, 1998	Throughout operational phases

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			• Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. • Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. • Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: • Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must 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. • Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). • The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	• NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. <u>Loss of soil due to un- vegetated areas:</u> • NEMBA (Act No. 10 of 2004). • NEMA, 1998 • Bare areas need to be re-vegetation to prevent soil erosion.	

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			Ensure baseline photographs are taken of all structures which may be impacted for photographic evidence prior to any blasting. Ensure procedures in place to compensate for damage. All neighbours need to be notified of each blasting activity. The R723 and N1 roads needs to be beacons off during the blasting event. Ensure that all power-related structures are adequately marked with relevant signs and warnings and fenced off.	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993	Throughout operational and decommissioning phases
			• Inform staff, contractors and visitors to not harm fauna in the area. • Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. • Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. • Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Conduct annual surveys to monitor faunal biodiversity. • Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	<u>Negative impact on fauna that may enter the area:</u> • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases
DRILLING AND BLASTING	10 ha	Operational phase	• Ensure permits are obtained to remove protected species. • Relocate all protected species with aid of specialists. • Only remove species in areas designated for activity and do not disturb surrounding areas. • Plan activities carefully so that only vegetation that needs to be impacted is impacted. • Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. • Limit activity to area of disturbance and revegetated impacted areas as soon as possible. • Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014.	<u>Management of weed- or invader plants</u>: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. <u>Negative impact on biodiversity of the area (Site Alternative 1):</u> NEM:BA, 2004	Throughout operational and decommissioning phases

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			• Management must take responsibility to control declared invader or exotic species on the habilitated 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 with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.		
DRILLING AND BLASTING	10 ha	Operational phase	Keep mining in footprint		Throughout operational and decommissioning phases
			• Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. • Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
			• Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> • NWA, 1998 • NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
			Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. Should graves be observed on site during activity progress then all activity should be ceased and the area demarcated as a no-go zone. A specialists will need to be consulted and responsible action considered, whether grave relocation or ceasing activity	<u>Loss of Artefacts and Graves:</u> National Heritage Resources Act No. 25 of 1999	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
DRILLING AND BLASTING	10ha	Operational phase	• Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. • Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. • Ensure water management facilities are operating adequately. Clean out silt build up over dry season. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	NWA, 1998	Throughout operational and decommissioning phases
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	10 ha	Operational phase	<u>Visual Mitigation:</u> • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	<u>Land use zoning:</u> • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational phase
			<u>Dust Handling:</u> • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40 km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits	<u>Dust Handling:</u> NEM: AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• Roads will be sprayed with water regularly, especially during times of high dust generation.		
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	10 ha	Operational phase	**Emission Handling:** All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
			Noise Handling: • The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. • Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. • Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	**Noise Handling:** • NEM: AQA, 2004 Regulation 6(1) • All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
			• Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. • Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. • Ensure water management facilities are operating adequately. Clean out silt build up over dry season. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	NWA, 1998	Throughout operational and decommissioning phases
			• Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles.	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas:	Throughout operational phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. • Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: • Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must 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. • Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). • The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.	• NEMBA (Act No. 10 of 2004). • NEMA, 1998 • Bare areas need to be re-vegetation to prevent soil erosion.	
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	10 ha	Operational phase	• Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. • For large spills Hazmat will called in. • All leaks will be cleaned up immediately using an absorbent material. • Rigs will be regularly serviced to reduce risk of leaks. • Pans will be placed under potential leak sites. • Any leakages should be reported and treated as per the emergency response plan. • Utilize water on site responsibly.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. • Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. • Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. • Bunded area will have adequate capacity to capacity to contain leaks. • Large leaks will be cleared by reputable oil recycling company.		
			Ensure that all stuff are made aware of all working conditions on site	<u>The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure.</u> • MHSA, 1996 • OHSA, 1993	Throughout operational and decommissioning phases
			• Inform staff, contractors and visitors to not harm fauna in the area. • Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. • Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. • Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Conduct annual surveys to monitor faunal biodiversity. • Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.	<u>Negative impact on fauna that may enter the area:</u> • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	10 ha	Operational phase	• Ensure permits are obtained to remove protected species. • Relocate all protected species with aid of specialists. • Only remove species in areas designated for activity and do not disturb surrounding areas. • Plan activities carefully so that only vegetation that needs to be impacted is impacted. • Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. • Limit activity to area of disturbance and revegetated impacted areas as soon as possible. • Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed.	<u>Management of weed- or invader plants</u>: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. <u>Negative impact on biodiversity of the area (Site Alternative 1):</u> NEM:BA, 2004	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated 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 with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.		
			Keep mining in footprint		Throughout operational and decommissioning phases
			• Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> • NWA, 1998 • NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
EXCAVATION AND LOADING OF	10 ha	Operational phase	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity. Should graves be observed on site during activity progress then all activity should be ceased and the area demarcated as a no-go zone. A specialists will need to be consulted and responsible action considered, whether grave relocation or ceasing activity	<u>Loss of Artefacts and Graves:</u> National Heritage Resources Act No. 25 of 1999	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. • Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
CRUSHING AND SCREENING OF AGGREGATES	1ha	Operational phase	**Dust Handling:** • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40 km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits • Roads will be sprayed with water regularly, especially during times of high dust generation.	Dust Handling: NEM: AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
			Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
CRUSHING AND SCREENING OF AGGREGATES	1ha	Operational phase	**Noise Handling:** • The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. • Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. • Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	**Noise Handling:** • NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
CRUSHING AND SCREENING OF AGGREGATES	1 ha	Operational phase	• Inform staff, contractors and visitors to not harm fauna in the area. • Consider the use of bird flappers and balls on the power lines to reduce risk of birds colliding with power lines. • Relocate larger animals with the aid of specialists. Ensure relevant permits are in place. • Utilize directional lighting and use yellow and orange lighting where possible to reduce impacts on insects. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Conduct annual surveys to monitor faunal biodiversity. • Negative impact on fauna that may enter the area: • The site manager must ensure that no fauna is caught, killed, harmed, sold or played with. • Workers must be instructed to report any animals that may be trapped in the working area. • No snares may be set or nests raided for eggs or young.		
			<u>Visual Mitigation:</u> • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	<u>Land use zoning:</u> • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational phase
CRUSHING AND SCREENING OF AGGREGATES	1ha	Operational phase	• Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. • Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks.	<u>Loss of topsoil due to incorrect storm water management:</u> • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. <u>Loss of soil due to un- vegetated areas:</u> • NEMBA (Act No. 10 of 2004). • NEMA, 1998 • Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases

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			• Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. • Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: • Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must 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. • Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). • The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.		
CRUSHING AND SCREENING OF AGGREGATES	1 ha	Operational phase	• Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. • Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. • Ensure water management facilities are operating adequately. Clean out silt build up over dry season. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	NWA, 1998	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. • For large spills Hazmat will called in. • All leaks will be cleaned up immediately using an absorbent material. • Rigs will be regularly serviced to reduce risk of leaks. • Pans will be placed under potential leak sites. • Any leakages should be reported and treated as per the emergency response plan. • Utilize water on site responsibly. • Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. • Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. • Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. • Bunded area will have adequate capacity to capacity to contain leaks. • Large leaks will be cleared by reputable oil recycling company.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases
STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	6,8 ha	Operational phase	**<u>Dust Handling:</u>** • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40 km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits • Roads will be sprayed with water regularly, especially during times of high dust generation.	<u>Dust Handling:</u> NEM: AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
			<u>Emission Handling:</u> All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	<u>Dust Handling:</u> • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			All intersections with main tarred roads will be clearly signposted. drivers will be enforced to keep to set speed limits. Trucks will be road-worthy condition. A fund will be set aside to maintain the serviceability of the road verge where the trucks approach or depart from the main road. Ensure directional floodlights are utilized that focus light on the necessary areas and reduce light pollution to surrounding environment.	<u>Degradation of the gravel access road:</u> • NRTA, 1996 The gravel access road needs to be monitored for signs of degradation. Should any signs become apparent immediate rectification actions must be implemented.	Throughout operational and decommissioning phases
			<u>Noise Handling:</u> • The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. • Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. • Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	**<u>Noise Handling:</u>** • NEM: AQA, 2004 Regulation 6(1) • All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	6,8ha	Operational phase	• Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. • Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. • Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented.	<u>Loss of topsoil due to incorrect storm water management:</u> • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. <u>Loss of soil due to un- vegetated areas:</u> • NEMBA (Act No. 10 of 2004). • NEMA, 1998 • Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases

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			• The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose: • Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must 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. • Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). • The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.		
STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	6,8 ha	Operational phase	• Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. • For large spills Hazmat will called in. • All leaks will be cleaned up immediately using an absorbent material. • Rigs will be regularly serviced to reduce risk of leaks. • Pans will be placed under potential leak sites. • Any leakages should be reported and treated as per the emergency response plan. • Utilize water on site responsibly. • Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. • Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. • Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. • Bunded area will have adequate capacity to capacity to contain leaks. • Large leaks will be cleared by reputable oil recycling company.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases

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			• Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. • Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. • Ensure water management facilities are operating adequately. Clean out silt build up over dry season. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	NWA, 1998	Throughout operational and decommissioning phases
			<u>Visual Mitigation:</u> • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	<u>Land use zoning:</u> • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational phase
STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	6,8ha	Operational phase	• Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal. • Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed.	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> • NWA, 1998 • NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.		
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	25.4ha	Decommissioning phase	• Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Waste generated on site should be recycled as far as possible and sold/ given to interested contractors. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality. • Vegetate rehabilitated area as soon as possible. Vegetable berms and stockpiles. • Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants. • Re-vegetate any bare soil immediately. Inspect, especially after first heavy rain falls to ensure adequate surface water drainage. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. • Loss of topsoil due to incorrect storm water management • Storm water must be diverted around the topsoil heaps, processing and stockpile areas to prevent erosion. • Topsoil heaps must be stockpiled along the northern and western boundaries of the study area to divert runoff water away from the processing area. Site management must weekly monitor the stockpiles and should any signs of erosion become apparent soil erosion protection measures must be implemented. • The effectiveness of the storm water infrastructure needs to be continuously monitored. • The activity must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department of Mineral Resources may impose:	<u>Loss of topsoil due to incorrect storm water management:</u> • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. <u>Loss of soil due to un- vegetated areas:</u> • NEMBA (Act No. 10 of 2004). • NEMA, 1998 • Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must 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. • Storm water management must apply for the entire life cycle of the site and over different hydrological cycles (rainfall patterns). • The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management.		
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	25,4 ha	Decommissioning phase	Ensure soils are replaced to an adequate depth and ensure soil quality is adequate.	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases
			Dust Handling: • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. • During periods of high wind spells, the stockpiles must be dampened to control dust emission. • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access roads must be limited to 40 km/h to prevent the generation of excess dust. All contractors will enforce speed limits. • Gravel roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits • Roads will be sprayed with water regularly, especially during times of high dust generation.	Dust Handling: NEM: AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
			Emission Handling: All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions.	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			Noise Handling: • The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • All project-associated vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. • Trucks, machinery and equipment will be regularly serviced to ensure acceptable noise levels are not exceeded. Point sources will be enclosed where possible. • Silencers will be utilized where possible. Screens will be considered if I&AP complaints are received.	**Noise Handling:** • NEM: AQA, 2004 Regulation 6(1) • All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	25.4ha	Decommissioning phase	• Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. • For large spills Hazmat will called in. • All leaks will be cleaned up immediately using an absorbent material. • Rigs will be regularly serviced to reduce risk of leaks. • Pans will be placed under potential leak sites. • Any leakages should be reported and treated as per the emergency response plan. • Utilize water on site responsibly. • Ensure all pipelines and water containment facilities are adequately sealed to prevent leaks. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. • Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. • Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. • Bunded area will have adequate capacity to capacity to contain leaks. • Large leaks will be cleared by reputable oil recycling company.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases
			• Contamination of surface or groundwater due to hazardous spills not cleaned: • Regular vehicle maintenance may only take place at the workshop on site. 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 200 litter closed container/bin to be removed from the emergency service area to the formal workshop in order to ensure proper disposal.	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Spills must be cleaned up immediately to the satisfaction of the Regional Manager of DMR by removing the spillage together with the polluted soil and by disposing it at a recognized facility. Proof must be filed. • Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste. • Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point, collected on a weekly basis, and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or near the processing area. • Biodegradable refuse generated must be handled as indicated above.		
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	25,4 ha	Decommissioning phase	• Ensure permits are obtained to remove protected species. • Relocate all protected species with aid of specialists. • Only remove species in areas designated for activity and do not disturb surrounding areas. • Plan activities carefully so that only vegetation that needs to be impacted is impacted. • Incorporate herbaceous vegetation into soil stockpiles to maintain a seed bank. • Limit activity to area of disturbance and revegetated impacted areas as soon as possible. • Eradicate and control all alien invasive species on site. Rehabilitate and revegetated all areas where alien invasive species were removed. Management of weed- or invader plants: • A weed and invader plant management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014. • Management must take responsibility to control declared invader or exotic species on the habilitated 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 with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide." • The temporary topsoil stockpiles needs to be kept free of weeds.	<u>Management of weed- or invader plants</u>: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. <u>Negative impact on biodiversity of the area (Site Alternative 1):</u> • NEM:BA, 2004	Throughout operational and decommissioning phases
			Specialist must be consulted f issues with groundwater are observed and qualities do not fall within the DWS target qualities or water qualities for livestock watering. Any affected registered water user must be compensated if levels an quality are impacted by the mining activities	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	*25,4 ha*	Decommissioning phase	• Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place. • All hydrocarbons will be stored in mobile bunded containers fitted with taps. Bunded area will have adequate capacity to capacity to contain leaks. Large leaks will be cleared by reputable oil recycling company. • Inspect area for erosion and pooling and rehabilitate if necessary. Continue with surface water monitoring. • Ensure water management facilities are operating adequately. Clean out silt build up over dry season. • Truck, machinery and equipment will be regularly serviced to reduce risk of leaks. • Any leakages should be reported and treated immediately in a reputable manner. For large spills Hazmat will called in. Pans will be placed under potential leak sites. Any leakages should be reported and treated as per the emergency response plan.	NWA, 1998	Throughout operational and decommissioning phases
			Specialist must be consulted f issues with surface water are observed and qualities do not fall within the DWS target qualities or water qualities for livestock watering. Any affected registered water user must be compensated if levels an quality are impacted by the mining activities. Ensure water management facilities are operating adequately. Clean out silt build up over dry season. Monitor area for erosion and pooling and rehabilitate if necessary. Continue with Surface water monitoring.	NWA, 1998	Throughout operational and decommissioning phases
			Ensure that all stuff are made aware of all working conditions on site	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993	Throughout operational and decommissioning phases
			Inform staff, contractors and visitors to not harm fauna in the area. Conduct annual surveys to monitor faunal biodiversity.	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases
			Keep mining in footprint. Excavation areas will be sloped during rehabilitation to even out depressions.		Throughout operational and decommissioning phases
			Monitor, especially after first heavy rain falls to ensure adequate surface water drainage		Throughout operational and decommissioning phases

NAME OF ACTIVITY	SIZE AND SCALE OF DISTURBANCE	PHASE	MITIGATION MEASURES	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	25,4 ha	Decommissioning phase	Visual Mitigation: • The site must have a neat appearance and be kept in good condition at all times. • The height of the stockpiles must be controlled to manage the visual impact on the surrounding environment. • Upon rehabilitation of the processing area all infrastructure must be removed and the area must be returned to its prior status. Screens will be considered if I&AP complaints are received. Directional lighting and soft lighting will be utilized to ensure that only areas required to be lit are lit. screens will be considered if I&AP complains are received. • Waste generated on site should be recycled as far as possible and sold/given to interested contractors. Recyclable waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recyclable waste for disposal at the municipality.	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational phase
			• Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA. • Should it be found that after mining operation have ceased, that the natural vegetation of the area is unacceptable, the area would be re-vegetated with an indigenous s grass seed mix.	Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ());

NAME OF ACTIVITY whether listed or not listed	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts)	ASPECTS AFFECTED	PHASE In which impact is anticipated	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc. Etc.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)		(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))	E.g. Modify through alternative method. Control through noise control. Control through management and monitoring. Remedy through rehabilitation.	
DEMARCATION OF SITE WITH VISIBLE BEACONS.	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	N/A	Construction / Site Establishment phase	N/A	Processing of the waste rock/stone is only allowed within the boundaries of the approved processing area. • MHSA, 1996 • OHSA, 1993
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	N/A		N/A	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Portable Toilets Potential harm through sewage leaks	Groundwater		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Portable Toilets Potential harm through sewage leaks	Surface Water		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Portable Toilets Potential harm through sewage leaks	Soils		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Portable Toilets Potential harm through sewage leaks	Social		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.	Operational phase	<u>Control:</u> Implementation of proper housekeeping	<u>Land use zoning:</u> • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		**Control:** Noise control measures	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
					contamination. The precautionary principal must apply.
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Alteration of topography	Topography	Operational phase	Control: Surface water Monitoring	
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Social		Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
STRIPPING AND STOCKPILING OF TOPSOIL	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.	Operational phase	Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
					• The property is zoned for agriculture as primary use.
STRIPPING AND STOCKPILING OF TOPSOIL	Dust nuisance caused by the disturbance of soil.	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		**Control:** Noise control measures	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
STRIPPING AND STOCKPILING OF TOPSOIL	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
					• NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.
STRIPPING AND STOCKPILING OF TOPSOIL	Alteration of topography	Topography	Operational phase	Control: Surface water Monitoring	
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Disturbance of geological strata	Geology		N/A	
DRILLING AND BLASTING	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.	Operational phase	Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.
	Dust nuisance due to excavation activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Control: Dust Suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
DRILLING AND BLASTING	Noise nuisance generated by drilling equipment and blasting	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.	Operational phase	Control: Noise Control Measures	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
	Impact on the water quality. Changes to the hydrological regime of the stream	Wetlands and Pans		**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	NWA, 1998
	Loss of riparian vegetation, aquatic habitat and stream continuity (migration corridors)	Wetlands and Pans		**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	NWA, 1998
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
	Health and Safety Risk by Blasting Activities. Potential danger to surrounding communities	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented		Control: Implementation of safety control measures	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
DRILLING AND BLASTING	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora	Operational phase	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004
	Alteration of topography	Topography		Control: Surface water Monitoring	
	Disturbance of geological strata	Geology		N/A	-

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.	Operational phase	Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Dust nuisance due to excavation activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Control: Dust Suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance generated by excavation equipment	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Control: Noise Control Measures	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies.	Surface water Bodies		Control: Surface water Management Implement storm water control measures.	NWA, 1998

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.			Measures will be implemented as subscribed by DWS.	
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
	Unsafe working conditions for employees	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented		Control: Implementation of safety control measures	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away	Operational phase	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora		**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004
	Alteration of topography	Topography		Control: Surface water Monitoring	
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Loss of and disturbance to surface archaeological sites	Artefacts or graves		**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Disturbance of geological strata	Geology		N/A	
CRUSHING AND SCREENING OF AGGREGATES	Dust nuisance due to loading and transportation of the material	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
CRUSHING AND SCREENING OF AGGREGATES	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by crushing plant.	The noise impact must be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Control: Noise Control Measures	Noise Handling: NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators.	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.				
	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.		Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
CRUSHING AND SCREENING OF AGGREGATES	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution	Operational phase	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO	Dust nuisance due to loading and transportation of the material	Should dust levels become excessive it may have an impact on surrounding landowners.		Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1). All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Emissions caused by vehicles and equipment	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Road degradation. Increased potential for road incidences Potential distraction to road users	All road users will be affected		Control & Remedy: Road management	Degradation of the gravel access road: • NRTA, 1996 The gravel access road needs to be monitored for signs of degradation. Should any signs become apparent immediate rectification actions must be implemented.
	Noise nuisance caused by vehicles	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Control: Noise control measures	Noise Handling: - NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.		**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution	Operational phase	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Deterioration in visual aesthetics of the area	The visual impact may affect the aesthetics of the landscape.		Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Decommissioning phase	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Soils replaced and ameliorated	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Decommissioning phase	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Dust nuisance caused during landscaping activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Control: Dust Suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Emissions caused by vehicles and equipment	Emissions will be contained within the property boundaries and will therefore affect only the landowner.		Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.		Control: Noise Management	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Groundwater pollution		Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed		Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	Flora	Decommissioning phase	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004
	Improve response to issues relating to deterioration of groundwater quality or quantity	Groundwater improvement		Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Surface water Bodies		Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998
	Health and safety risk posed by un-sloped areas	The impact on health and safety due to un-sloped areas will be contained within the site boundary.		Control: Sloping of areas upon decommission	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993
	Reintroduction of fauna attracted to flora to the area	Fauna returning to area		Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.
	Alteration of topography	Topography		Control: Surface water Monitoring	
	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Topography		Control: Surface water Monitoring	
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Improved aesthetics through rehabilitation	The visual impact may affect the aesthetics of the landscape.	Decommissioning phase	Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Land use		Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
whether listed or not listed	(Including the potential impacts for cumulative impacts)	(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..)		
(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops.	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	E.g. Modify through alternative method. Control through noise control. Control through management and monitoring. Remedy through rehabilitation.		
DEMARCATION OF SITE WITH VISIBLE BEACONS.	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	N/A	Processing of the waste rock/stone is only allowed within the boundaries of the approved processing area. • MHSA, 1996 • OHSA, 1993	Beacons need to be in place throughout the life of the activity.
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	N/A	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	Construction / Site Establishment phase
	Portable Toilets Potential harm through sewage leaks	Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	Construction / Site Establishment phase
	Deterioration in visual aesthetics of the area	Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational phase
	Dust nuisance caused by the disturbance of soil.	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Emissions caused by vehicles and equipment	Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	**Control:** Noise control measures	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	Throughout operational and decommissioning phases
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases
	Contamination of area with hydrocarbons or hazardous waste materials	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
	Alteration of topography	Control: Surface water Monitoring		Throughout operational and decommissioning phases
	Loss of and disturbance to surface archaeological sites	**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	Throughout operational and decommissioning phases
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
	Influx of unsuccessful job seekers which may informally settle in area. Potential danger to surrounding communities	Control through proper site management	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.	Construction / Site Establishment phase
STRIPPING AND STOCKPILING OF TOPSOIL	Deterioration in visual aesthetics of the area	Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational phase
	Dust nuisance caused by the disturbance of soil.	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Emissions caused by vehicles and equipment	Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	**Control:** Noise control measures	**Noise Handling:** NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
STRIPPING AND STOCKPILING OF TOPSOIL	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases
	Contamination of area with hydrocarbons or hazardous waste materials	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
	Alteration of topography	Control: Surface water Monitoring		Throughout operational and decommissioning phases
	Loss of and disturbance to surface archaeological sites	**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	Throughout operational and decommissioning phases
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area.	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
	Impact to nocturnal insects and their predators and other nocturnal animals.			
STRIPPING AND STOCKPILING OF TOPSOIL	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
	Disturbance of geological strata	N/A	-	Throughout operational and decommissioning phases
DRILLING AND BLASTING	Deterioration in visual aesthetics of the area	Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational and decommissioning phases
	Dust nuisance due to excavation activities	Control: Dust Suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Noise nuisance generated by drilling equipment and blasting	Control: Noise Control Measures	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases
	Impact on the water quality. Changes to the hydrological regime of the stream	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	NWA, 1998	Throughout operational and decommissioning phases
	Loss of riparian vegetation, aquatic habitat and stream continuity (migration corridors)	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	NWA, 1998	Throughout operational and decommissioning phases
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater.	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
	Potential contamination through littering leeching into the groundwater table			
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases
DRILLING AND BLASTING	Health and Safety Risk by Blasting Activities. Potential danger to surrounding communities	Control: Implementation of safety control measures	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993	Throughout operational and decommissioning phases
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	Throughout operational and decommissioning phases
	Alteration of topography	Control: Surface water Monitoring		Throughout operational and decommissioning phases
	Disturbance of geological strata	N/A	-	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
	Contamination of area with hydrocarbons or hazardous waste materials	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
	Loss of and disturbance to surface archaeological sites	**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	Throughout operational and decommissioning phases
DRILLING AND BLASTING	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Deterioration in visual aesthetics of the area	Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational phase
	Dust nuisance due to excavation activities	Control: Dust Suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Emissions caused by vehicles and equipment	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Noise nuisance generated by excavation equipment	Control: Noise Control Measures	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases
	Unsafe working conditions for employees	Control: Implementation of safety control measures	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993	Throughout operational and decommissioning phases
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	Throughout operational and decommissioning phases
	Alteration of topography	Control: Surface water Monitoring		Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
	Contamination of area with hydrocarbons or hazardous waste materials	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
	Loss of and disturbance to surface archaeological sites	**Control:** Survey area before site clearance	Loss of Artefacts and Graves: National Heritage Resources Act No. 25 of 1999	Throughout operational and decommissioning phases
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases
	Disturbance of geological strata	N/A	-	Throughout operational and decommissioning phases
CRUSHING AND SCREENING OF AGGREGATES	Dust nuisance due to loading and transportation of the material	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Emissions caused by vehicles and equipment	Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Noise nuisance caused by crushing plant.	Control: Noise Control Measures	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
	Alienation of animals from the area. Potential risk to avifauna. Potential harm through littering. Loss of food, nest sites and refugia Hindrance to nocturnal animals and change in behaviour of nocturnal prey and predators. New habitat available to fauna in the area and reduced activity should result in influx of animals to the area. Impact to nocturnal insects and their predators and other nocturnal animals.	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases
	Deterioration in visual aesthetics of the area	Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational phase

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases
CRUSHING AND SCREENING OF	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases
STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	Dust nuisance due to loading and transportation of the material	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1). All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
	Emissions caused by vehicles and equipment	Control: Dust suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Road degradation. Increased potential for road incidences Potential distraction to road users	Control & Remedy: Road management	Degradation of the gravel access road: • NRTA, 1996 The gravel access road needs to be monitored for signs of degradation. Should any signs become apparent immediate rectification actions must be implemented.	Throughout operational and decommissioning phases
	Noise nuisance caused by vehicles	Control: Noise control measures	Noise Handling: NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases
STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO	Deterioration in visual aesthetics of the area	Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws • The property is zoned for agriculture as primary use.	Throughout operational phase
	Contamination of area with hydrocarbons or hazardous waste materials	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998 • NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Potential compaction of soils in neighbouring areas. Potential contamination through littering. Potential for loss of soil & damage to soil characteristics. Initial increased potential for loss of soils and soil erosion. Potential hydrocarbon contamination to soils.	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases
	Soils replaced and ameliorated	**Control:** Storm water management Site Management Soil Management	Loss of topsoil due to incorrect storm water management: • NEMA, 1998 • NWA, 1998 • NEMBA, 2004 • GNR 598 and 599 of 2014 • The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes. Loss of soil due to un- vegetated areas: • NEMBA (Act No. 10 of 2004). • NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.	Throughout operational phases
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Dust nuisance caused during landscaping activities	Control: Dust Suppression	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Emissions caused by vehicles and equipment	Control: Emissions	Dust Handling: • NEM:AQA, 2004 Regulation 6(1)	Throughout operational and decommissioning phases
	Noise nuisance caused by machinery	Control: Noise Management	Noise Handling: _NEM: AQA, 2004 Regulation 6(1) All project related vehicles must be in a road worthy condition in terms of the Road Transport Act, 1987	Throughout operational and decommissioning phases
	Potential hydrocarbon contamination leeching into the water table. Reduction of local groundwater. Potential contamination through littering leeching into the groundwater table	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned:	Throughout operational and decommissioning phases
	Contamination of area with hydrocarbons or hazardous waste materials	Control: Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: • NWA, 1998	Throughout operational and decommissioning phases

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• NEM: WA, 2008 • Every precaution must be taken to prevent contamination. The precautionary principal must apply.	
	Loss of biodiversity. Potential damage to vegetation in neighbouring areas. Alien invasive encroachment	**Control & Remedy:** Implementation of weed control and weed/invader plant management plan Management of buffer areas and demarcation of work areas. Modify: Consider use of a less sensitive area	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014. Negative impact on biodiversity of the area (Site Alternative 1): • NEM:BA, 2004	Throughout operational and decommissioning phases
	Improve response to issues relating to deterioration of groundwater quality or quantity	Control: Proper site management.	Contamination of surface or groundwater due to hazardous spills not cleaned: NWA, 1998	Throughout operational and decommissioning phases
	Potential silt-loading of drainage lines, downstream and surrounding water bodies. Potential hydrocarbon contamination which may reach downstream surface water bodies. Potential surface water contamination if leaks escape into the environment. Potential impact of mining activities on the runoff and infiltration of storm water.	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.		Throughout operational and decommissioning phases
	Containment of dirty water. Improve response to issues relating to deterioration of surface water quality or quantity. free drainage resorted to area. Revegetation of disturbed areas reduces risk of silt loading on downstream water bodies. Large area of surface water runoff return to catchment	Control: Surface water Management Implement storm water control measures. Measures will be implemented as subscribed by DWS.	NWA, 1998	Throughout operational and decommissioning phases
	Health and safety risk posed by un-sloped areas	Control: Sloping of areas upon decommission	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. • MHSA, 1996 • OHSA, 1993	Throughout operational and decommissioning phases
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Reintroduction of fauna attracted to flora to the area	Control: Implementation of fauna protection measures	Negative impact on fauna that may enter the area: • NEM:BA, 2004 • Site management has to strive to eliminate the impact on fauna in the surrounding environment for the duration of the processing activities.	Throughout operational phases
	Alteration of topography	Control: Surface water Monitoring		Throughout operational and decommissioning phases
	Eradication of trenches and berms. Re-contouring of area for free surface water drainage. Eradication of stockpiles	Control: Surface water Monitoring		Throughout operational and decommissioning phases
	Improved aesthetics through rehabilitation	Control: Implementation of proper housekeeping	Land use zoning: • Free State LUPA • Local Municipality: Land Use Planning Bylaws	Throughout operational phase

NAME OF ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED	TIME PERIOD FOR IMPLEMENTATION
			• The property is zoned for agriculture as primary use.	
	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers). Degrading of grazing potential for livestock farming	Control: Fire	• Every precaution must be taken to prevent contamination. The precautionary principal must apply.	Throughout operational and decommissioning phases

i) Financial Provision

(1) Determination of the amount of Financial Provision.

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22 (2) (d) as described in 2.4 herein.

The closure objectives entail the sloping, landscaping and replacement of the topsoil over the processing area in order to rehabilitate the disturbance. The stockpiled topsoil will be spread over the disturbed area to a depth of at least 500 mm.

The primary objective is to obtain a closure certificate at the end of the life of the mine at minimum cost and in as short a time period as possible whilst still complying with the requirements of the Minerals and Petroleum Resources Development Act. To realise this, the following objectives must be achieved:

- Remove all temporary infrastructure and waste from the site as per the requirements of this EMPR and of the Provincial Department of Mineral Regulation.
- Demolish / rehabilitate all roads with no post - mining use potential.
- Ensure that no threat to surface and underground water quality remains.
- Ensure that all permanent changes in topography are sustainable and do not cause erosion or the damming up of runoff.
- Shape and contour all disturbed areas in compliance with the EMPR.
- The stockpiled topsoil will be spread over the disturbed area to a depth of at least 500 mm.
- Make safe any dangerous excavations or subsidence on the surface.
- Rehabilitate all disturbed areas in compliance with the EMPR and of the Provincial Department of Mineral Regulation.
- Final rehabilitation will entail the removal of all infrastructure and equipment from the site.
- Final sloping, landscaping, levelling and top dressing will be done on all areas.
- Ensure that all rehabilitated areas are safe, stable and self-sustaining in terms of vegetation.
- Control of weeds and alien invasive plant species is an important aspect after topsoil replacement and seeding has been done in an area.
- Site management will implement an alien invasive plant management plan during the 12 months' aftercare period to address germination of problem plants in the area.
- The applicant will comply with the minimum closure objectives as prescribed by DMR.

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties

This report, the Final Environmental Impact Assessment Report and Environmental Management Programme Report, includes all the environmental objectives in relation to closure and will be made available for perusal of I&AP's and stakeholders. Any additional comments received during the commenting period was added to the Final Environmental Impact Assessment Report and Environmental Management Programme Report to be submitted to DMR for approval.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The requested rehabilitation plan is attached as Appendix 7. Upon closure of the mining activity all infrastructure will be removed. The compacted areas will be ripped and levelled upon which the topsoil will be replaced. No permanent structures will remain upon closure of the site.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The rehabilitation of the mining area as indicated on the rehabilitation plan attached as Appendix 7 will comply with the minimum closure objectives as prescribed by DMR and detailed below, and therefore is deemed to be compatible.

The objective of the rehabilitation plan is to ensure that:

a) the areas disturbed by the prospecting and mining activities are rehabilitated and/or landscaped;
b) that the site and areas disturbed by prospecting and mining activities are visually appealing and are left in a neat and tidy condition;
c) contaminants/pollution sources are removed from the site or that appropriate measures are in place to control long-term contamination sources;
d) the site and surrounding disturbed areas are in a stable condition.

Listed below are the provisional requirements for rehabilitation of the site. These are intended as a guideline.

Actions to clear the site:

1. Remove all containers and temporary office structures from the site.
2. Drain all pollution sumps and dispose of all solid and liquid waste at a permitted landfill site.
3. Break up all concrete structures, cart concrete from the site and dispose of at a permitted landfill site.
4. Collect all litter and packaging from within the site as well as the peripheral areas and dispose at a permitted landfill site.
5. Remove all waste building components/parts from the site (whether scrap or not) including metal, wood, drums, plastic, cabling, tubing, etc.
6. Ensure that no waste is buried on site.
7. Disconnect all temporary power, water and sewerage connections.
8. Disassemble and remove all ablution facilities.
9. Ensure that all infrastructure routes are rehabilitated and stable.
10. Clear weeds from the construction site and peripheral disturbed areas.
11. Clear all litter and rubble from drainage lines and disposes of appropriately.
12. Ensure that all public roads are satisfactorily cleared of rubble
13. Repair damaged road curbs or other structures

Landscape the mine site:

1. Backfill all remaining voids or if not possible blast steps of 2 m high x 3 m wide to make the steep cliffs safer.
2. Flatten the heaps of over burden that remains after all voids have been filled
3. Remove all stockpiled rubble from the site and dispose of at a permitted disposal site
4. Ensure that no bare, unvegetated areas remain.
5. Rehabilitate (rip and hydro seed) all disused compacted surfaces, tracks and roads
6. Make provision for the rehabilitation of peripheral areas not directly included within the site that were disturbed during the construction process. Rehabilitation may entail grading, levelling, fertilizing and re-grassing.
7. Identify actual and potential erosion sites and implement measures for control/prevention of erosion. Ensure that appropriate erosion control measures are installed around storm water outlets and stabilise and re-grass areas around storm water outlets with indigenous species.
8. Stabilise the watercourse banks and re-grassing to prevent erosion
9. Where possible indigenous plants must be used as part of the landscaping process.

10. The Landscape Contractor is to ensure that adequate planting of indigenous plants is catered for. The ECO is to review and approve the landscaping plans.
11. It is recommended that efforts on invasive species management, erosion control and rehabilitation is coordinated to avoid negative effects of one development on the environmental state on and around the other (Preez, July 2018).

Rehabilitation of the excavated area:

- Due to the impracticality of importing large volumes of fill to restore the quarry area to its original topography, the rehabilitation option is to develop the quarry into a minor 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 slopes on the benches below, thereby reducing the overall face angle.
- Fill and topsoil could be placed over the benches to provide a suitable medium for the establishment of vegetation, especially trees which will break up the line of the faces and enhance their appearance. The floor of the quarry must be capped with suitable soil material and re-vegetated.
- Rocks and coarse material removed from the excavation must be dumped into the excavation.
- No waste will be permitted to be deposited in the excavations.
- Once overburden, rocks and coarse natural materials has been dumped into the excavated area and profiled with acceptable contours and erosion control measures, topsoil shall be returned over the area.
- The area shall be fertilized to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.
- 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.

Rehabilitation of plant, office and service areas:

- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.

- Stockpiles will be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium.
- On completion of operations, all structures or objects shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act [MPRDA], 2002 (Act No. 28 of 2002):
    - Where sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
    - Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10 cm above the surrounding ground surface.
    - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- Photographs of the camp and office sites, before and during the mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.
- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 200 mm and graded to an even surface condition. Where applicable / possible topsoil needs to be returned to its original depth over the area.
- Prior to replacing the topsoil, the material that was removed from these areas will be replaced in the same order as it originally occurred.
- The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- 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 seed mix to his or her specification.

Final rehabilitation:

- Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding and maintenance, and weed / alien clearing.
- All infrastructures, equipment, plant, temporary housing and other items used during the mining period will be removed from the site.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried or burned on the site.

- Weed / Alien clearing will be done in a sporadic manner during the life of the mining activities. Species regarded as weeds according to the National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014 Species regarded as need to be eradicated from the site on final closure.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.
- Seeding of the area:
    - Once the pit slopes have been shaped and the soil replaced, the initial goal is to establish a good cover of a robust grass that will stabilise the soil and start the accumulation of soil organic carbon. This will be done using a combination of hydro seeding and physical planting of runners to apply a mix of commercial and indigenous species that includes both tufted and creeping species. The plants that were collected during the establishment and operational phases and kept in the designated area will be replanted.

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

The calculation of the quantum for financial provision was according to Section B of the working manual.

Mine type and saleable mineral by-product

According to Tables B.12, B.13 and B.14

Mine type	Gravel
Saleable mineral by-product	None

Risk ranking

According to Tables B.12, B.13 and B.14

Primary risk ranking (either Table B.12 or B.13	C (Low risk).
Revised risk ranking (B.14)	N/A

Environmental sensitivity of the mine area

According to Table B.4

Environmental sensitivity of the mine area	Low

Level of information

According to Step 4.2:

Level of information available	Limited

Identify closure components

According to Table B.5 and site-specific conditions

There is currently an old Mining Permit that is applicable over 1.5ha of the site. This application for the Mining Permit includes the 1.5ha, totalling to 25.4ha. That said that the 1.5ha Mining Permit area is included in the quarry pit area of the new Mining Right Application. For this reason, the previous quantum calculation has been included to indicate what have been included in the quantum calculation, and what the Bank Guarantee will be used for.

Table 35: Table B.5 for 100045 MR

Component No.	Main description	Applicability of closure components (Circle Yes or No)	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	No
2(A)	Demolition of steel buildings and structures	-	No
2(B)	Demolition of reinforced concrete buildings and structures	-	No
3	Rehabilitation of access roads	-	No
4(A)	Demolition and rehabilitation of electrified railway lines	-	No
4(B)	Demolition and rehabilitation of non-electrified railway lines	-	No
5	Demolition of housing and facilities	-	No
6	Opencast rehabilitation including final voids and ramps	Yes	-
7	Sealing of shafts, adits and inclines		No
8(A)	Rehabilitation of overburden and spoils	Yes	-

Component No.	Main description	Applicability of closure components (Circle Yes or No)	
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing)	-	No
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich)	-	No
9	Rehabilitation of subsided areas	-	No
10	General surface rehabilitation, including grassing of all denuded areas	Yes	-
11	River diversions	-	No
12	Fencing	-	No
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)	-	No
14	2 to 3 years of maintenance and aftercare	Yes	-

Fences will be removed from the 10001MP quantum. 2 to 3 years' maintenance and aftercare have been included in the 100045 MR mining right.

Unit rates for closure components

According to Table B.6 master rates and multiplication factors for applicable closure components.

Component No.	Main description	Master rate	Multiplication factor
1	Dismantling of **processing plant and related structures** (including overland conveyors and power lines)	-	-
2(A)	Demolition of **steel buildings and structures**	-	-
2(B)	Demolition of **reinforced concrete buildings and structures**	-	-
3	Rehabilitation of **access roads**	-	-

Component No.	Main description	Master rate	Multiplication factor
4(A)	Demolition and rehabilitation of **electrified railway lines**	-	-
4(B)	Demolition and rehabilitation of **non-electrified railway lines**	-	-
5	Demolition of **housing and facilities**	-	-
6	**Opencast rehabilitation** including final voids and ramps	253 019	0.04
7	Sealing of **shafts, adits and inclines**	-	-
8(A)	Rehabilitation of **overburden and spoils**	168 679	1.00
8(B)	Rehabilitation of **processing waste deposits and evaporation ponds (basic, salt-producing)**	-	-
8(C)	Rehabilitation of **processing waste deposits and evaporation ponds (acidic, metal-rich)**	-	-
9	Rehabilitation of **subsided areas**	-	-
10	**General surface rehabilitation**, including grassing of all denuded areas	133 622	1.00
11	**River diversions**	-	-
12	**Fencing**		
13	**Water management** (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)	-	-
14	2 to 3 years of **maintenance and aftercare**	17 782	1.00

Determine weighting factors

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	1.00 (Flat)
Weighting factor 2: Proximity to urban area where goods and services are to be supplied	1.05 (Peri-Urban)

Calculation of closure costs

Table B.10 Template for Level 2: "Rules-base" assessment of the quantum for financial provision

Table 36: Quantum Calculation for 100045MR

Table B.10 Template for Level 2: "Rules-based" assessment of the quantum for financial provision						
CALCULATION OF THE QUANTUM						
Mine:		Bloemhof Quarry		**Location:**		Parys
Evaluators:		C Fouché		**Date:**		17/07/2020
	Description	**A Quantity**	**B Master rate**	**C Multiplication factor**	**D Weighting factor 1**	**E=A *B*C*D Amount (rands)**
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	0	17	1	1	R 0,00
2(A)	Demolition of steel buildings and structures	0	241	1	1	R 0,00
2(B)	Demolition of reinforced concrete buildings and structures	0	356	1	1	R 0,00
3	Rehabilitation of access roads	0	43	1	1	R 0,00
4(A)	Demolition and rehabilitation of electrified railway lines	0	419	1	1	R 0,00
4(B)	Demolition and rehabilitations of non-electrified railway lines	0	229	1	1	R 0,00
5	Demolition of housing and/or administration facilities	0	483	1	1	R 0,00
6	Opencast rehabilitation including final voids and ramps	8,7	253 019	0,04	1	R 88 050.61
7	Sealing of shaft, audits and inclines	0	130	1	1	R 0,00
8(A)	Rehabilitation of overburden and spoils	6,6	168 679	1	1	R 1 113 281.40
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	0	210 087	1	1	R 0,00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	0	610 192	0,51	1	R 0,00
9	Rehabilitation of subsided areas	0	141 244	1	1	R 0,00

10	General surface rehabilitation	8,7	133 622	1	1	R 1 162 511.40
11	River diversions		133 622	1	1	R 0,00
12	Fencing		152	1	1	R 0,00
13	Water Management		50 807	0,17	1	R 0,00
14	2 to 3 years of maintenance and aftercare	25,4	17.782	1	1	R 451 662.80
	Specialists study				1	R 0,00
	Specialists study					R 0,00
						R 2 815 506.21
	Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)		1,05		**Sub Total 1**	R 2 956 281.52
	Preliminary and General	6%				R 177 376.89
	Contingency		10.0% of Subtotal 1			R 295 628.15
	(Subtotal 1 plus management and contingency)				**Sub Total 2**	R 3 429 286.57
	Vat (15%)				**Sub Total 3**	R 514 392.98
	(Subtotal 3 plus VAT)				**GRAND TOTAL**	R 3 943 679.55

The amount that will be necessary for the rehabilitation of damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum total of **R 3 943 679.55.**

Please see the explanation as to how this amount was derived at attached as Appendix 14. A Bank Guarantee will be provided for the proposed site.

(f) Confirm that the financial provision will be provided as determined.

Herewith I, the person, whose name is stated below confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application. I herewith confirm that the company will provide the amount that will be determined by the Regional Manager in accordance with the prescribed guidelines.

The financial provision calculations for Bloemhof quarry undertaken by making use of the Department of Mineral and Resource (DMR) guideline document for financial provision, with the master rates of 2020 and amount to **R 3 943 679.55.** This amount when approved by the DMR will be provided in the form of a bank guarantee. Details of the financial provision are attached in Appendix 14.

Please see the explanation as to how this amount was derived at attached as Appendix 14. A Bank Guarantee will be provided for the proposed site.

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

a) **Monitoring of Impact Management Actions**
b) **Monitoring and reporting frequency**
c) **Responsible persons**
d) **Time period for implementing impact management actions**
e) **Mechanism for monitoring compliance**

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
whether listed or not listed			(FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	
(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control. berms,				
DEMARCATION OF SITE WITH VISIBLE BEACONS.	Maintenance of beacons	• Visible beacons need to be established at the corners of the processing area. • A 20m buffer area (if applicable) from any natural areas need to be demarcated. • A 30m buffer area from a watercourse needs to be demarcated if applicable.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	N/A	N/A	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Ground water	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			Officer. Role: • Ensure beacons are in place throughout the life of the activity.	• Annual compliance monitoring of site by an Independent Environmental Control Officer.
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Surface Water	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Soils	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Social	Monitor portable toilets for any leaks	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Minimize the visual impact of the activity on the surrounding environment	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. Dust Monitoring will also be conducted on site on a monthly basis.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Emission Monitoring: • The emissions generated by the processing activities must be continuously	Emission Handling and Monitoring: • Emissions will be monitored	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • All vehicles in good working order to reduce risk of emissions	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Noise Monitoring • The noise impact should be contained within the boundaries of the property, as it will represent the current activities	**Noise Handling and Monitoring:** • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Management of weed or invader plants • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed.	Inspect progress of construction & ensure activity is in designated areas. Inspect area for damage to flora species. Establish alien invasive monitoring programme Management of weed or invader plants: • Removal of weeds must be manually or by the use of an approved herbicide. Management of buffer areas: • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. Protection of fauna: • Site management has to protect fauna that enters the processing area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer
	Soil Management Topsoil Management **Soil erosion:** • Loss of reinstated topsoil after rehabilitation.	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Waste Management: • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily.	Waste Management: • Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. • A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. • Drip trays must be available to place underneath equipment parked for the night. • Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. • Waste disposal register and file for the keeping of safe disposal records. • Ensure that hazardous substances if any are stored within a securely fenced area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	N/A	Inspect area for erosion and pooling.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Protection of Cultural and Heritage Artefacts	Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	Groundwater	**<u>Groundwater Monitoring:</u>** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Surface water Bodies	**<u>Surface water Monitoring:</u>** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
ESTABLISHMENT OF TEMPORARY BUILDINGS AND INFRASTRUCTURE WITHIN BOUNDARIES OF SITE.	Protection of fauna	Monitor any ecologically sensitive species should they be observed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	Fire Management	Fire Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Social	Ensure employment is in line with SLP initiatives. Inspect all complaints received and compare against photographic evidence. Inspect areas and ensue fences haven't been tampered with and no illegal connections have been added to lines	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure beacons are in place throughout the life of the activity.	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
STRIPPING AND STOCKPILING OF TOPSOIL	Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Minimize the visual impact of the activity on the surrounding environment	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. Dust Monitoring will also be conducted on site on a monthly basis.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Emission Monitoring: • The emissions generated by the processing activities must be continuously	Emission Handling and Monitoring: • Emissions will be monitored	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • All vehicles in good working order to reduce risk of emissions	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
STRIPPING AND STOCKPILING OF TOPSOIL	**<u>Noise Monitoring</u>** • The noise impact should be contained within the boundaries of the property, as it will represent the current activities	**<u>Noise Handling and Monitoring:</u>** • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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STRIPPING AND STOCKPILING OF TOPSOIL	Management of weed or invader plants • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed.	Inspect progress of construction & ensure activity is in designated areas. Inspect area for damage to flora species. Establish alien invasive monitoring programme Management of weed or invader plants: • Removal of weeds must be manually or by the use of an approved herbicide. Management of buffer areas: • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. Protection of fauna: • Site management has to protect fauna that enters the processing area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer
	Soil Management Topsoil Management **Soil erosion:** • Loss of reinstated topsoil after rehabilitation.	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
STRIPPING AND STOCKPILING OF TOPSOIL	Waste Management: • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily.	Waste Management: • Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. • A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. • Drip trays must be available to place underneath equipment parked for the night. • Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. • Waste disposal register and file for the keeping of safe disposal records. • Ensure that hazardous substances if any are stored within a securely fenced area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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STRIPPING AND STOCKPILING OF TOPSOIL	N/A	Inspect area for erosion and pooling.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Protection of Cultural and Heritage Artefacts	Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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STRIPPING AND STOCKPILING OF TOPSOIL	Groundwater	**Groundwater Monitoring:** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Surface water Bodies	**Surface water Monitoring:** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Protection of fauna	Monitor any ecologically sensitive species should they be observed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control

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STRIPPING AND STOCKPILING OF TOPSOIL	Fire Management	Fire Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	N/A	N/A	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
DRILLING AND BLASTING	Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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DRILLING AND BLASTING	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Noise Monitoring • The noise impact should be contained within the boundaries of the property, as it will represent the current activities	Noise Handling and Monitoring: • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Surface water Bodies	**<u>Surface water Monitoring:</u>** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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DRILLING AND BLASTING	Groundwater	**Groundwater Monitoring:** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Soil Management Topsoil Management **Soil erosion:** • Loss of reinstated topsoil after rehabilitation.	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer
	Social Health and Safety Risk	Health and Safety Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure workers have access to the correct personal protection equipment (PPE) as required by law. • Manage all operations in compliance with the Occupational Health and Safety Act as well as the Mine Health and Safety Act.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control

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	Protection of fauna	Monitor any ecologically sensitive species should they be observed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control
DRILLING AND BLASTING	Management of weed or invader plants • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed.	Inspect progress of construction & ensure activity is in designated areas. Inspect area for damage to flora species. Establish alien invasive monitoring programme Management of weed or invader plants: • Removal of weeds must be manually or by the use of an approved herbicide. Management of buffer areas: • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. Protection of fauna: • Site management has to protect fauna that enters the processing area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer

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DRILLING AND BLASTING	N/A	Inspect area for erosion and pooling.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	N/A	N/A	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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DRILLING AND BLASTING	Fire Management	Fire Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Waste Management: • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily.	Waste Management: • Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. • A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. • Drip trays must be available to place underneath equipment parked for the night. • Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. • Waste disposal register and file for the keeping of safe disposal records. • Ensure that hazardous substances if any are stored within a securely fenced area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site at. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

NAME OF ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
DRILLING AND BLASTING	Protection of Cultural and Heritage Artefacts	Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Surface water Bodies	**<u>Surface water Monitoring:</u>** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Wetlands and Pans	**<u>Sensitive Sites Monitoring:</u>** All equipment needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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DRILLING AND BLASTING	Wetlands and Pans	**<u>Sensitive Sites Monitoring:</u>** All equipment needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Minimize the visual impact of the activity on the surrounding environment	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental

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	Emission Monitoring: • The emissions generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Emission Handling and Monitoring: • Emissions will be monitored	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Noise Monitoring • The noise impact should be contained within the boundaries of the property, as it will represent the current activities.	Noise Handling and Monitoring: • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Surface water Bodies	**<u>Surface water Monitoring:</u>** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Soil Management Topsoil Management **Soil erosion:** • Loss of reinstated topsoil after rehabilitation.	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer
	Groundwater	**Groundwater Monitoring:** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Social Health and Safety Risk	Health and safety Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure workers have access to the correct personal protection equipment (PPE) as required by law. • Manage all operations in compliance with the Occupational Health and Safety Act as well as the Mine Health and Safety Act.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control

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EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Protection of fauna	Monitor any ecologically sensitive species should they be observed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control
	Management of weed or invader plants • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed.	Inspect progress of construction & ensure activity is in designated areas. Inspect area for damage to flora species. Establish alien invasive monitoring programme Management of weed or invader plants: • Removal of weeds must be manually or by the use of an approved herbicide. Management of buffer areas: • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. Protection of fauna: • Site management has to protect fauna that enters the processing area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer

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EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	N/A	Inspect area for erosion and pooling.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Waste Management: • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily.	Waste Management: • Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. • A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. • Drip trays must be available to place underneath equipment parked for the night. • Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. • Waste disposal register and file for the keeping of safe disposal records. • Ensure that hazardous substances if any are stored within a securely fenced area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Protection of Cultural and Heritage Artefacts	Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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EXCAVATION AND LOADING OF AGGREGATES TO BE PROCESSED	Fire Management	Fire Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	N/A	N/A	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
CRUSHING AND SCREENING OF AGGREGATES	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. Dust Monitoring will also be conducted on site on a monthly basis.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental

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CRUSHING AND SCREENING OF AGGREGATES	Emission Monitoring: • The emissions generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Emission Handling and Monitoring: • Emissions will be monitored	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Noise Monitoring • The noise impact should be contained within the boundaries of the property, as it will represent the current activities.	Noise Handling and Monitoring: • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Protection of fauna	Monitor any ecologically sensitive species should they be observed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control

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CRUSHING AND SCREENING OF AGGREGATES	Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Minimize the visual impact of the activity on the surrounding environment	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Soil Management Topsoil Management **Soil erosion:** • Loss of reinstated topsoil after rehabilitation.	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer
	Surface water Bodies	**Surface water Monitoring:** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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CRUSHING AND SCREENING OF AGGREGATES	Groundwater	**<u>Groundwater Monitoring:</u>** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental

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STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Management of Access Roads • The condition of the access road must be continuously monitored.	Management of Access Roads: • Dust suppression equipment such as a water car and dispenser. • Grader to restore the road surface when needed. Inspect intersections and roads will be clearly signposted. Drivers will be enforced to keep to set speed limits. Trucks will be in worthy condition with reflective strips	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Divert storm water around the access roads to prevent erosion. • Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas. • Repair rutting and erosion of the access roads caused by the processing activities	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control
	Noise Monitoring • The noise impact should be contained within the boundaries of the property, as it will represent the current activities.	Noise Handling and Monitoring: • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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TRANSPORTATION OF MATERIAL FROM STOCKPILE STOCKPILING AND TRANSPORTATION OF MATERIAL FROM AREA TO CLIENTS	Soil Management Topsoil Management **Soil erosion:** • Loss of reinstated topsoil after rehabilitation.	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer
	Groundwater	**Groundwater Monitoring:** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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STOCKPILING AND TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	Surface water Bodies	**<u>Surface water Monitoring:</u>** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Minimize the visual impact of the activity on the surrounding environment	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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TRANSPORTATION OF MATERIAL FROM STOCKPILE AREA TO CLIENTS	Waste Management: • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily.	Waste Management: • Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. • A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. • Drip trays must be available to place underneath equipment parked for the night. • Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. • Waste disposal register and file for the keeping of safe disposal records. • Ensure that hazardous substances if any are stored within a securely fenced area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Soil Management Topsoil Management **Soil erosion:** • Loss of reinstated topsoil after rehabilitation.	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer
	Soil Management Topsoil Management **Soil erosion:** • Loss of reinstated topsoil after rehabilitation.	**Soil Handling:** • Excavating equipment to remove the first 500 mm of topsoil from the proposed work areas. The applicant already has this equipment available. • Berms to be made to direct storm- and runoff water around the stockpiled topsoil area. • Ensure that topsoil is being kept separate form overburden. **Erosion monitoring:** • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Strip and stockpile the upper 500 mm of the soil and protect as topsoil. • Remove topsoil at right angles to the slope to slow down surface runoff and prevent erosion. • Conduct topsoil stripping, stockpiling and re-spreading in a systematic way. Ensure topsoil is stockpiled for the minimum possible time. • Protect topsoil stockpiles against losses by water and wind erosion through the establishment of plants on the stockpiles. • Topsoil heaps may not exceed 1.5 m in order to preserve microorganism within the topsoil. • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer

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SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. Dust Monitoring will also be conducted on site on a monthly basis.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental
	Emission Monitoring: • The emissions generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.	Emission Handling and Monitoring: • Emissions will be monitored	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. • Dampen the stockpiles during periods of high wind spells. • Assess effectiveness of dust suppression equipment. • Limit speed on the access roads to 40km/h to prevent the generation of excess dust. • Spray gravel roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Monthly compliance monitoring of site by fallout dust monitoring consultant. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental

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SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Noise Monitoring • The noise impact should be contained within the boundaries of the property, as it will represent the current activities.	Noise Handling and Monitoring: • Site manager to ensure that the vehicles are equipped with silencers and maintained in a road worthy condition. • Compliance with the appropriate legislation with respect to noise will be mandatory.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the processing area. • Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Groundwater	**<u>Groundwater Monitoring:</u>** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Waste Management: • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily.	Waste Management: • Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. • A hydrocarbon spill kit to enable sufficient clean-up of contaminated areas. • Drip trays must be available to place underneath equipment parked for the night. • Should a vehicle have a break down, it must be decommissioned immediately and removed from site to be serviced. • Waste disposal register and file for the keeping of safe disposal records. • Ensure that hazardous substances if any are stored within a securely fenced area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Management of weed or invader plants • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed.	Inspect progress of construction & ensure activity is in designated areas. Inspect area for damage to flora species. Establish alien invasive monitoring programme Management of weed or invader plants: • Removal of weeds must be manually or by the use of an approved herbicide. Management of buffer areas: • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. Protection of fauna: • Site management has to protect fauna that enters the processing area.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Implement a weed and invader plant management plan. • Control declared invader or exotic species on the rehabilitated areas. • Keep the temporary topsoil stockpiles free of weeds.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer
	Groundwater	**<u>Groundwater Monitoring:</u>** Equipment's needs to be monitored to prevent any hydrocarbon spills.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Surface water Bodies	**<u>Surface water Monitoring:</u>** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Surface water Bodies	**<u>Surface water Monitoring:</u>** Ensure no litter or contaminants lie on the ground.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Health and safety risk	· Health and safety Management:	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure workers have access to the correct personal protection equipment (PPE) as required by law. • Manage all operations in compliance with the Occupational Health and Safety Act as well as the Mine Health and Safety Act.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control
	Protection of fauna	Monitor any ecologically sensitive species should they be observed on site.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Contain all activities within the boundaries of the approved processing area. • Demarcate, signpost and manage the 20 m buffer area as no-go area around areas with natural vegetation. • Ensure no fauna is caught, killed, harmed, sold or played with. • Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control

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SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	N/A	Inspect area for erosion and pooling.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Inspect area for erosion and pooling.	Inspect area for erosion and pooling.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Ensure regular vehicle maintenance only take place within the service bay area of the on-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 litter closed container/bin inside the emergency service area. • Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. • Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility. File proof. • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection must take place on a regular basis and waste must be disposed of at the nearest recognized landfill site. Prevent refuse from being dumped on or near the processing area. • Biodegradable refuse to be handled as indicated above. • Ensure that chemical toilet facilities function properly, is not abused and does not pose any harm to the environment. • Ensure that pollution control measures are adequate and well maintained, e.g. bund walls, drop pan and concrete slabs, in order to prevent soil and water pollution.	• Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.
	Monitoring of visual impacts. Inspect area for illegal littering and dumping	• Ensure that the site have a neat appearance and is kept in good condition at all times. • Control the height of the stockpiles to minimize the visual impact on the surrounding environment. • Remove all infrastructure upon rehabilitation of the processing area and return the area to its prior status.	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Minimize the visual impact of the activity on the surrounding environment	• Throughout Operational Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

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SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Fire Management	Fire Management	Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: • Immediately stop work should any evidence of human burials or other heritage artefact be discovered during the execution of the activities. • Notify Heritage Free State and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free State.	• Throughout Construction, Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer. • Annual compliance monitoring of site by an Independent Environmental Control Officer.

l) Indicate the frequency of the submission of the performance assessment report.

The Mineral and Petroleum Resources Development Regulations stipulates that performance assessment reporting must be done annually. The applicant commits to submitting the performance assessment reports of the proposed processing activity annually to DMR for perusal.

m) Environmental Awareness Plan

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

The purpose of this section is to outline the methodology that will be used to educate the mine's employees and contractors of any environmental risks associated with their work and the manner in which these risks must be dealt with so as to avoid pollution and minimize the degradation of the environment.

Once approved a copy of the Environmental Management Programme will be handed to the site manager. Issues such as topsoil handling, site clearance, fire principals and waste handling will be discussed with the manager to ensure that he understands the goals as set out in the EMPR. An induction meeting will also be held with all the site workers to inform them of the basic steps towards environmental awareness with regard to the environment. Please refer to Appendix 15 for the full Environmental Awareness Plan for Bloemhof Quarry.

The operations manager must ensure that he/she understands the EMPR document and its requirement and commitments. An Environmental Control Officer needs to check compliance of the mining activities to the management programmes described in the EMPR.

Training Needs

A training needs analysis will be performed through all levels of the organization including those within the administration, plant and mining worker sectors. Each of the categories / levels of the organization have different responsibilities and roles, accordingly different knowledge requirements are applicable. These are summarized in Table 37 below.

After the training needs have been identified, it is the responsibility of the SHE Office to ensure that personnel attend the relevant identified training.

Training will also address the specific measures and actions as listed in the EMP. This Environmental Awareness Plan (EAP) is intended to supplement the Safety, Health and Environmental (SHE) training and awareness requirements.

Table 37: Environmental Awareness Plan

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
Senior Management including Process Managers and Head of Department	Managing the Social & Environmental Assessment & Management System (SEAMS), and the Safety, Health & Environmental (SHE) Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the significant impacts as described in the EIA/EMP during the various phases		
		Knowledge of the commitments made in the EMP relevant to the various phases		
		Setting and reviewing the mine's Environmental objectives		
		Directing the SEAMS and SHE management system, and monitoring their progress		
		Accessing the legal register and searching for details	Training on the legal register	Once off
		Emergency preparedness and response		
Environmental Management Representative, SHE Officer & Internal Auditor	Managing the SEAMS and the SHE Management System Monitoring and auditing	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the significant impacts as described in the EIA/EMP during the various phases		
		Knowledge of the commitments made in the EMP relevant to the various phases		
		Directing the SEAMS and SHE management system, and monitoring their progress		
		Current knowledge of South African regulatory requirements, best practice guidelines and applicable legislation	Training on the legal register	On going
		Emergency preparedness and response		
		Knowledge in spill management, stockpile management, discard management, water management and waste management	Meetings and Talk Topics	Continuous
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
		Knowledge of the SABS standards and other relevant legislation regarding the correct storage of chemicals	Training on the SABS standards and other legislation	Annual
		Knowledge of auditing techniques and report writing	Auditor training	Annual
Section Managers & Section Engineers	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases		
		Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.	Meetings and talk topics	Continuous
		Knowledge in stockpile management, discard management, water management and waste management		
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge in the correct storage of chemicals		
Engineering HOD & General Engineering Supervisor	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System	General in-house, management training	Once off
		Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases		
		Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.		
		Knowledge in spill management and waste management	Meetings and talk topics	Continuous
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		Knowledge in the correct storage of chemicals		

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
Mine Captain & General Engineering Supervisors	Implementation and daily management of the SEAMS and the SHE Management System	Understanding the purpose of the SEAMS and SHE Management System Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases Actively implementing actions to achieve SEAMS Management Plans and Environmental Objectives.	General in-house, management training	Once off
		Knowledge in spill management and waste management Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting Knowledge in the correct storage and handling of chemicals Understanding the requirements for not polluting the environment	Meetings and talk topics	Continuous
Supervisors, Shift Boss & Forman	General Environmental Awareness and job specific impacts	Understanding the purpose of the SEAMS and SHE Management System Knowledge of the relevant department's significant impacts as described in the EIA/EMP during the construction and operational phases Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting Knowledge in spill management and waste management Understanding the requirements for not polluting the environment	General in-house, management training	Once off
Operators, tradespersons & Floor Employees	General Environmental Awareness and job specific impacts	General Awareness of aim and purpose of the SEAMS and SHE Management System Understanding the SEAMS Management Plan relevant to their operations	Environmental Awareness Training	Annual

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
		Understanding the requirements for not polluting the environment General understanding of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
General Administration Staff	General Environmental Awareness and job specific impacts	General Awareness of aim and purpose of the SEAMS and SHE Management System Understanding the SEAMS Management Plan relevant to their operations Understanding the requirements for not polluting the environment General understanding of the relevant Operational procedures, Emergency Response Plans and Incident reporting	Environmental Awareness Training	Annual
Security	General Environmental Awareness and job specific impacts	General Awareness of aim and purpose of the SEAMS and SHE Management System Understanding the requirements for not polluting the environment General understanding of the relevant Operational procedures, Emergency Response Plans and Incident reporting	Environmental Awareness Training	Annual

Specialized Skills

The Training Department in conjunction with the SHE Officer are responsible for ensuring job specific training for personnel performing tasks, which can cause significant environmental and social impacts (e.g. receipt of bulk hazardous chemicals/fuel, hazardous materials handling, responding to emergency situations etc.). The Mine Manager with the assistance of the SHE Officer must identify relevant personnel and training courses.

On the job training is an essential tool in environmental awareness. Employees must be given details of the expected environmental issues and concerns specifically related to their occupation. Employees must be trained on how to respond if an environmental problem or source of environmental pollution arises. The training will be on-going, and all new employees will be provided with the same standard of training as existing employees.

Review of Training Material

Effectiveness of the environmental management training will be done by the management through task observations and during internal and external audits.

All training material for presentation to personnel and contractors will be reviewed annually to ensure consistency with organizational requirements and best practice guidelines. In addition to this, annual monitoring reports, audit results and all incident reports will be reviewed, any short comings and non-compliancy will be highlighted and management measures incorporated or improved upon within the training material.

Records

Records from the implementation of this EAP will be kept and controlled in accordance with the SHE Management System Control of Records Procedure, which is required to be implemented so as to provide evidence of conformity and effective operation of the relevant requirements of the SHE management system.

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

The operations manager must ensure that he/she understands the EMPr document and its requirement and commitments before any activity takes place. An Environmental Control Officer needs to check compliance of the processing activities to the management programmes described in the EMPr.

EMERGENCY RESPONSE PLAN AND PROCEDURES

As part of its management tools, a mine must have an Emergency Response Plan. These plans will be disseminated to all employees and contractors in the event of an emergency.

In the case of a medical accident or problem, the mine has first aid kits available at various points and an emergency room. A First Aid officer will be on duty at all times. In the event of an emergency the checklist of emergency response units must be consulted and the relevant units notified.

Communication is vital in an emergency and thus communication devices, such as mobile phones, two-way radios, pagers or telephones, must be placed around the mine. Should the emergency have the potential to affect the surrounding communities, they will be alerted via alarm signals or contacted in person.

Emergency services will be sourced from the nearest main town, Bloemhof wherever possible. Contact details for the emergency services and local authorities are listed below; these will be displayed on site and made available to all employees and contractors.

Koppies Police Department:	056-7771775/1300
Ambulance:	
▪ Ambulance Intensive Medical Rescue	0839101011
▪ Ambulance Life Med	0186108691
▪ Ambulance Parys Medix	0835590674
▪ Ambulance Parys Provincial 10177 Or	0514076000
Hospital:	056 816 2100
DWS:	012 336 7500
DMR:	(057) 391 1300

The following list represents the basic steps towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks.

Site Management:

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

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 streams;
- After a heavy rainstorm or at least every 3 months, all water pollution control structures like storm water berms and trenches will be checked for signs of damage or change in its capacity;
- Any damage to any water pollution structures will be repaired immediately; and
- Any of the above actions will be included in the performance assessment report to the Department of Mineral Resources (DMR).
- Maintenance activities shall not lead to undue damage, blockages or disruption of the drainage lines or stormwater channels on site or concentrate stormwater sheet flow into erosive channels.
- Sediment to be removed on a need basis from all drainage channels, culverts and pipes under roads to prevent blocked pipes and erosion damage to road sides due to disrupted flow.
- Significant erosion in the drainage lines or stormwater channels or swales shall be addressed by implementing water slowing measures e.g. temporary straw bales or sand bags or permanent gabion weirs and stabilised overflows and crossings to prevent recurrence.
- All erosion channels anywhere on site shall be repaired immediately through backfilling with appropriate material and stabilising to prevent recurrence.
- Where vegetation has been washed away or damaged as a result of the erosion this shall be reinstated once the area has been stabilised.
- Stabilisation measures e.g. grass blocks shall be maintained in good repair.
- No materials or wastes shall be dumped into stormwater channels, in the drainage lines or their buffer zones. Any litter or foreign material blown or washed into these areas inadvertently is to be removed regularly (minimum monthly) without undue disturbance to the vegetation and stability of the area.
- Fuel or oil or other chemical spills anywhere on site should be treated immediately with an appropriate mop-up or bio-remedial product as directed by manufacturers to prevent contamination of runoff.

Dam wall failures and burst high-volume dirty water pipelines have been identified as potential emergency situations. The following steps will be followed:

- Turn off all water supply to the dam/pipeline;
- Dispatch necessary emergency services;
- Take all reasonable measures to stop the spread of contaminated water, such as downstream emergency trenches and berms;
- The incident must be reported to the Environmental Coordinator immediately;
- The Environmental Coordinator will assess the situation from the information provided, and set up an investigation team or relevant personnel. Included in this team could be the Mine Manager, Chief Safety Officer, the employee who reported the incident and any individual responsible for the incident;
- When investigating the incident, priority must be given to safety;
- Once the situation has been assessed, the Environmental Officer must report back to the Mine Manager;
- The Mine Manager and the investigating team must take a decision on what measures can be taken to limit the damage caused by the incident, and if possible any remediation measures that can be taken; and
- The DWS and DEDET will be notified of the incidence.

Flooding

There is potential for flooding during the rainy season. This could result in a large volume of water flowing downstream or accumulating in a water containment facility and could cause major damage to equipment and endanger the lives of employees on site. Procedures must be put in place to ensure that there is a quick response to flood events and damage is kept to a minimum.

The procedure for flooding is as follows:

- DWS's flood warning system will be reviewed annually;
- The use of emergency pumps if the water floods the underground, where it may be exposed to contamination;
- Mine management will be made aware of any such event so they can take appropriate action to ensure production losses are kept to a minimum;
- All dams and water containment facilities will have a 0.8 m freeboard and an overflow or outlet to ensure that no damage occurs to the facilities;

- All contaminated water will be contained on site, as far as possible and discharges to the environment will only occur if absolutely necessary in an extreme flood event.
    - Check that rainwater flows around work areas and are not contaminated;
    - Report any erosion;

- Check that dirty water is kept from clean water; and
- Do not swim in or drink from streams or the quarry.

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;
- Do not burn waste; and
- Pick-up any litter laying around.

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

Hydrocarbons such as diesel, petrol, and oil which are used as fuel for mine machinery which is kept on site, increases the possibility that spillage may occur. As this is a product mine there is also the possibility of a product spillage occurring. In the event of a spillage, procedures must be put into place to ensure that there are minimal impacts to the surrounding environment.

Diesel, engine oil and hydraulic oil are the most likely hydrocarbons identified during impact assessments that can result in an emergency situation.

The following procedure applies to a hydrocarbon spill:

- In the event of a small spillage, the soil will be treated in situ, using Hazmat clean up kits;
- Every precaution will be taken to prevent the spill from entering the surface water environment;
- In the event of a large spillage, adequate emergency equipment for spill containment or collection, such as additional supplies of booms and absorbent materials, will be made available and if required, a specialised clean-up crew will be called in to decontaminate the area. The soil will be removed and treated at a special soil rehabilitation facility;
- Reasonable measures must be taken to stop the spread of hydrocarbons and secure the area to limit access;

- Dispatch necessary services;
- The incident must be reported to the Environmental coordinator immediately;
- The Environmental Coordinator will assess the situation from the information provided, and set up an investigation team or relevant personnel. Included in this team could be the Mine Manager, Chief Safety Officer, the employee who reported the incident and any individual responsible for the incident;
- When investigating the incident, priority must be given to safety;
- Once the situation has been assessed, the Environmental Coordinator must report back to the Mine Manager;
- The Mine Manager and the investigation team must make a decision on what measures can be taken to limit the damage caused by the incident, and if possible any remediation measures that can be taken;
- The source / reason of the spill or leak will be addressed immediately;
    - 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; and
    - Label containers and move to approved storage area.

Breakdown of vehicles or equipment outside vehicle maintenance yard:

If any equipment of vehicles breaks down inside the excavation area or outside the storage yard the following emergency procedure will be followed:

- Drip pans will be placed at all point s where diesel, oil or any hydraulic fluid can rip and contaminate the oil;
- All efforts will be made to remove the vehicle or equipment to the storage area;
- If the vehicle or equipment cannot be removed the broken part will be drained of all fluid and the specific part remove to the service area;
- No repairs will be allowed to take place outside the maintenance yard or service area; and
- Any spills will be managed as described in the hydrocarbon section above.

Explosions

Explosions can occur in the plant and workshop areas when working with gas cylinders and chemicals. These could result in large numbers of employees being injured and requiring medical assistance.

The procedure to be followed is:

- Alternative evacuation routes will be devised, should a rock fall occur as a result of the explosion; and
- All relevant emergency response units must be notified and hospitals informed of incoming patients.

Discoveries:

- Stop work immediately;
- Notify site manager/supervisor; and
- Includes – Archaeological finds, Cultural artefacts, Contaminated water, Pipes, Containers, Tanks and drums, Any buried structures.

Air Quality:

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

Driving and Noise:

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

Flora and Fauna including alien invasive species:

- Do not remove any plants or trees without approval of the site manager;

- Do not collect fire wood;
- 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; and
- Do not set snares or raid nests for eggs or young.

Fire Management:

Veld fires and fires resulting from other sources must be handled with extreme caution. Fire extinguishers will be placed around the mine.

The following procedures apply to fires:

- In the event of a fire an alarm will be activated to alert all employees and contractors;
- Identify the type of fire and the appropriate extinguishing material. For example, water for a grass fire, and mono ammonium phosphate based fire extinguisher for chemical and electrical fires;
- In the event of a small fire the fire extinguishers placed around the mine will be used to contain and extinguish the fire;
- In the event of a large fire, the fire department will be notified and must react timeously;
- All staff will receive training in response to a fire emergency on site;
- A Fire Association will be set up with the mine and surrounding land owners to facilitate communication during fire events and assist in fighting fires, where necessary;
- If possible all surrounding drains, such as storm water drains need to be covered and or protected to prevent any contaminated water from entering the drains;
- In case of a chemical or petroleum fire, run-off from the area will be contained as far as possible using the most appropriate measures e.g. spill absorbent cushions, sand or a physical barrier;
- Contaminated run-off must be diverted into an oil sump, or cleaned up;
- All firefighting equipment will be inspected at least monthly to ensure that these are functioning;
- 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; and
- Don’t burn waste or vegetation.

Maintenance and Infrastructure Management

- Infrastructure visibly in good repair and operational areas kept tidy.
- The footprint of the operations and vehicular circulation is clearly defined with no "spill over" into other areas of the site.
- Roads are stable and in good repair and
- Fences and gates are in good repair.

In addition to the induction meeting to be held with the site employees to inform them of the basic steps towards environmental awareness, the operators of earth moving equipment should be informed of the following requirements:

- Mining within demarcated areas;
- No-go areas;
- Establishment of access roads;
- Handling of hazardous waste and their storage facilities;
- Handling of biodegradable and non-degradable waste;
- Vehicle maintenance;
- Mining methods to be followed;
- Handling and storing of topsoil;
- Sloping of excavations;
- Speed control in order to reduce dust;
- Emergency procedure awareness.
- Labourers must be informed of the following during “toolbox talks”:
- Reporting of unusual observations to management (e.g. fossils, graves, etc.);
- Reporting of spills to management;
- Felling or damaging trees for firewood not allowed;
- Making fires not allowed;
- Hunting and killing of animals not allowed;
- Demarcated areas for mining;
- Establishing of access roads and erection of gates in fence lines;
- Toilet facilities and hygiene measures;
- Handling of waste;
- Vehicle maintenance and vehicle maintenance yard;
- Handling of topsoil;
- Emergency procedures awareness.

n) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually).

The applicant undertakes to annually review and update the financial provision calculation, upon which it will be submitted to DMR for review and approved as being sufficient to cover the environmental liability at the time and for closure of the mine at that time.

Effectiveness of the environmental management training will be done by the management through task observations and during internal and external audits. All training material for presentation to personnel and contractors will be reviewed annually to ensure consistency with organizational requirements and best practice guidelines. In addition to this, annual monitoring reports, audit results and all incident reports will be reviewed, any short comings and non-compliancy will be highlighted and management measures incorporated or improved upon within the training material.

2. UNDERTAKING

The EAP herewith confirms

a) The correctness of the information provided in the reports ☒

b) The inclusion of comments and inputs from stakeholders and I&AP's; ☒

c) The inclusion of inputs and recommendations from the specialist reports where relevant; ☒ and

d) The acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; ☒

Signature of the environmental assessment practitioner:

Greenmined Environmental

Name of Company:

24 July 2020

Date:

-END-