

TJA NALEDI BEAFASE INVESTMENT HOLDINGS (PTY) LTD

BARRAGE BULK SAND MINE

MINING OF SAND, AGGREGATE AND ALLUVIAL DIAMONDS ON PORTION 4 OF THE FARM
WOODLANDS 407, NGWATHE LOCAL MUNICIPALITY, FREE STATE PROVINCE

FINAL BASIC ASSESSMENT AMENDMENT REPORT



MAY 2018

REFERENCE NUMBER: FS 30/5/1/1/2/10020MR

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ABBREVIATIONS

BID	Background Information Document
DBAR	Draft Basic Assessment Report
DEAT	Department of Environment, Agriculture and Tourism
DMR	Department of Mineral and Resources
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPR	Environmental Management Programme
FBAR	Final Basic Assessment Report
FS	Free State Province
GN	Government Notice
GNR	Government Notice Regulation
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
IWULA/IWMMP	Integrated Water Use Licence Application / Integrated Waste Water Management Plan
LED	Local Economic Development
LSU	Large Stock Unit
NEMA	National Environmental Management Act, 1998
MHSA	Mine Health and Safety Act
MPRDA	Minerals and Petroleum Resources Development Act, 2002
PPP	Public Participation Process
PPE	Personal Protective Equipment
Ptn	Portion
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SHE	Safety, Health and Environmental
SLP	Social and Labour Plan
SOM	Soil Organic Matter
Tja Naledi	Tja Naledi Beafase Investment Holdings (Pty) Ltd
WMA	Water Management Area

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BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATION IN TERMS OF THE NATIONAL ENVIRONMENTAL 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: *Tja Naledi Beafase Investment Holdings (Pty) Ltd*
TEL NO: *011 606 3116*
FAX NO: *011 608 2056*
POSTAL ADDRESS: *PO Box 11, Modderfontein, 1654*

FILE REFERENCE NUMBER SAMRAD: *FS 30/5/1/1/2/10020 MR*

I. Important Notice

In terms of the Mineral and Petroleum Resources Development Act (Act 29 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 can be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

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

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

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

2. Objective of The Basic Assessment Process

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

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

PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of the Practitioner: Greenmined Environmental
Yolandie Coetzee
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 Environmental Sciences. Please find full CV attached in Appendix I.

(2) Summary of the EAP's past experience.

(In carrying out the Environmental Impact Assessment Procedure)

Yolandie Coetzee is an Environmental Consultant with 7 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 I.

b) Location of the overall Activity.

Farm Name:	Portion 04 of the farm Woodlands 407, Ngwanthe Local Municipality, Free State Province.
Application area (Ha)	437.8330ha
Magisterial district:	Fezile Dabi District Municipality / Parys Magisterial District
Distance and direction from the nearest town	3.98 km southwest of Vaal Oewer, 22.26km north-east of Parys, 21.6km east of Sasolburg, Free State Province.
21 digit Surveyor General Code for each farm portion	F0250000000040700004

c) Locality map

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

The requested map is attached as Appendix A1.

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 aforesaid main and listed activities, and infrastructure to be placed on site

Tja Naledi Beafase Investment Holdings (Pty) Ltd, currently holds a Mining Right and approved Environmental Management Programme (EMPR) over portion 4 of the farm Woodlands 407 (437.8330ha), which falls in the Ngwanthe Local Municipality in the Fezile Dabi Magisterial district, Free State Province. Tja Naledi – Barrage Bulk Sand Mine, intends to apply for a Mining Right amendment, to include alluvial diamonds and gravel into the mining right, and to amend the EMPR to include processing.

The farm Woodlands 407 is situated approximately 3.98km southwest of Vaal Oewer, 22.26km north-east of Parys, 21.6km east of Sasolburg, Free State Province. The area is currently being mined by SPH Kundalila (contractor), under the old mining right (FS30/5/1/2/2/10020MR). The mining method to be used on Barrage Bulk Sand Mine will be strip mining. Mining will take place via a contractor (SPH Kundalila) who will excavate the material, load and haul the material to the processing plant. From the plant the material will be loaded via front end loader directly onto client's trucks. The material will be mined in strips (0.5ha each) with two strips being open at any given time. The maximum depth of the excavations will be 10 meters in some areas (building sand and gravel) and 5 meters in other areas (plaster sand). Aggregate will be crushed and screened before loaded onto client's trucks to remove any debris' contained in the aggregate, the aggregate will also be screened to identify any diamonds found in the product. All activities will be contained within the boundaries of the site.

The proposed mining area is approximately 437.8330ha is extent and the applicant, Tja Naledi – Barrage Bulk Sand Mine, intends to win material from the area for at least 10 years. Silica Sand and Gravel (aggregate) to be removed from the mine will be used for building material in the vicinity. Application is also being made for alluvial diamonds, in the case that these minerals will be found during mining. If diamonds where found in the aggregate, these will be separated during the screening process and sold to interested buyers. The proposed mine will therefore contribute to the building industry in and around Parys, Vanderbijlpark and Sasolburg area.

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Excavating;
- Crushing;
- Screening;
- 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:

- Excavating Equipment;
- Earthmoving Equipment;
- Mobile Crushing and Screening Plants;
- Temporary Offices;
- Weigh Bridge; and
- Storage Yard for storing of equipment.

A generator will be used to power the infrastructure on site until an Eskom connection can be secured. Water from the two boreholes on site (registered via the land owner) will be used dust suppression and drinking water on site. See the requested map attached as Appendix B.

Neighbouring property activities includes the activities below:

- Northern Neighbour – Low density property development in the North West Province and on the banks of the Vaal river;
- North and North west neighbours – sand mine and game farm owned by Goose Bay Developments;
- Southern Neighbour – Mixed farming;
- Eastern Neighbour – Mixed farming by Mr. Lawrence Sher; and
- Vaal Eden- Barrage road runs to in an East-West direction through the property.

i) Listed and specified activities

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY	LISTED ACTIVITY	APPLICABLE LISTING NOTICE (GNR 324, GNR 325, GNR 326 OR GNR 327)
(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.)	Ha or m ²	Mark with an X where applicable or affected	
Amendment of EMPR – Include Processing of the minerals (Sand, Gravel and Alluvial Diamonds)	437.8330ha	X	<u>GNR 326 Amendments to the Environmental Impact Assessment Regulations of 2017</u> <i>Part 2: Amendments where a change in scope occurs</i> Amendments to be applied for in terms of Part 2 31. An environmental authorisation may be amended by following the process prescribed in this Part if the amendment will result in a change to the scope of a

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY	LISTED ACTIVITY	APPLICABLE LISTING NOTICE (GNR 324, GNR 325, GNR 326 OR GNR 327)
			<p><i>valid environmental authorisation where such change will result in an increased level or change in the nature of impact where such level or change in nature of impact was not—</i></p> <ul style="list-style-type: none"> <i>(a) assessed and included in the initial application for environmental authorisation; or</i> <i>(b) taken into consideration in the initial environmental authorisation;</i> <p><i>and the change does not, on its own, constitute a listed or specified activity.</i></p> <p>Process and consideration of application for amendment</p> <p>32. (1) <i>The applicant must within 90 days of receipt by the competent authority of the application made in terms of regulation 31, submit to the competent authority—</i></p> <ul style="list-style-type: none"> <i>(a) a report, reflecting—</i> <ul style="list-style-type: none"> <i>(i) an assessment of all impacts related to the proposed change;</i> <i>(ii) advantages and disadvantages associated with the proposed change; and</i> <i>(iii) measures to ensure avoidance, management and mitigation of impacts associated with such proposed change; and</i> <i>(iv) any changes to the EMPR;</i> <i>which report—</i> <ul style="list-style-type: none"> <i>(aa) had been subjected to a public participation process, which had been agreed to by the competent authority, and which was appropriate to bring the proposed change to the attention of potential and registered interested and affected parties, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the competent authority, and</i> <i>(bb) reflects the incorporation of comments received, including any comments of the competent authority; or</i> <p><i>(b) a notification in writing that the report will be submitted within 140 days of receipt of the application by the competent authority, as significant changes have been made or significant new information has been added to the report, which changes or information was not contained in the report consulted on during the initial public participation process contemplated in subregulation (1)(a) and that the revised report will be subjected to another public participation process of at least 30 days.</i></p> <p>(2) <i>In the event where subregulation (1)(b) applies, the report, which reflects the incorporation of comments received, including any comments of the competent authority, must be submitted to the competent authority within 140 days of receipt of the application by the competent authority.</i></p>



NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY	LISTED ACTIVITY	APPLICABLE LISTING NOTICE (GNR 324, GNR 325, GNR 326 OR GNR 327)
			<p>Decision on amendment application</p> <p>33. (1) The competent authority must within 107 days of receipt of the report contemplated in regulation 32, in writing, decide the application;</p> <p>(2) On having reached a decision, the competent authority must comply with regulation 4(1), after which the holder applicant must comply with regulation 4(2).</p>

ii) Description of the activities to be undertaken

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

The farm Woodlands 407 is situated approximately 3.98km southwest of Vaal Oewer, 22.26km north-east of Parys, 21.6km east of Sasolburg, Free State Province. The area is currently being mined by SPH Kundalila (contractor), under the old mining right (FS30/5/1/2/2/10020MR). The mining method to be used on Barrage Bulk Sand Mine will be strip mining.

Mining will take place via a contractor (SPH Kundalila) who will excavate the material, load and haul the material to the processing plant. From the plant the material will be loaded via front end loader directly onto client's trucks. The material will be mined in strips (0.5ha each) with two strips being open at any given time. The maximum depth of the excavations will be 10 meters in some areas (building sand and gravel) and 5 meters in other areas (plaster sand). All activities will be contained within the boundaries of the site.

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

- A. 26°45'17.62"S 27°36'23.60"E
- B. 26°45'15.81"S 27°37'23.58"E
- C. 26°45'23.53"S 27°37'53.44"E
- D. 26°45'52.42"S 27°37'38.48"E
- E. 26°46'5.48"S 27°37'40.79"E
- F. 26°46'24.86"S 27°37'29.26"E
- G. 26°45'54.36"S 27°35'59.29"E
- A. 26°45'17.62"S 27°36'23.60"E

An amendment of the Mining Right Application in terms of Section 102 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) has been submitted to the Department of Mineral Resource, to include alluvial diamonds and gravel into the mining right.

The proposed project triggers the following listed activity 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 a Basic Assessment process to obtain environmental authorisation:

■ GNR 326 Amendments to the Environmental Impact Assessment Regulations of 2014

Part 2: Amendments where a change in scope occurs

Amendments to be applied for in terms of Part 2

31. *An environmental authorisation may be amended by following the process prescribed in this Part if the amendment will result in a change to the scope of a valid environmental authorisation where such change will result in an increased level or change in the nature of impact where such level or change in nature of impact was not—*

- (a) assessed and included in the initial application for environmental authorisation; or*
- (b) taken into consideration in the initial environmental authorisation;*

and the change does not, on its own, constitute a listed or specified activity.

Process and consideration of application for amendment

32. (1) *The applicant must within 90 days of receipt by the competent authority of the application made in terms of regulation 31, submit to the competent authority—*

- (a) a report, reflecting—*
 - (i) an assessment of all impacts related to the proposed change;*
 - (ii) advantages and disadvantages associated with the proposed change; and*
 - (iii) measures to ensure avoidance, management and mitigation of impacts associated with such proposed change; and*
 - (iv) any changes to the EMPR;*

which report—

- (aa) had been subjected to a public participation process, which had been agreed to by the competent authority, and which was appropriate to bring the proposed change to the attention of potential and registered interested and affected parties, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the competent authority, and*

(bb) reflects the incorporation of comments received, including any comments of the competent authority; or

- (b) a notification in writing that the report will be submitted within 140 days of receipt of the application by the competent authority, as significant changes have been made or significant new information has been added to the report, which changes or information was not contained in the report consulted on during the initial public participation process contemplated in subregulation (1)(a) and that the revised report will be subjected to another public participation process of at least 30 days.*

(2) *In the event where subregulation (1)(b) applies, the report, which reflects the incorporation of comments received, including any comments of the competent authority, must be submitted*

to the competent authority within 140 days of receipt of the application by the competent authority.

Decision on amendment application

33. (1) *The competent authority must within 107 days of receipt of the report contemplated in regulation 32, in writing, decide the application;*

(2) *On having reached a decision, the competent authority must comply with regulation 4(1), after which the holder applicant must comply with regulation 4(2).*

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. This has already been conducted, as SPH Kundalila is already mining in the area under the old mining right.

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 mineral 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 mine area does not need any specific or extra work to prepare the area for the recovery of sand. Demarcation of the first active mining cell will take one week.

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Excavating;
- Mobile Crushing and Screening Plants;
- 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:

- Excavating Equipment;
- Earthmoving Equipment;
- Mobile Crushing and Screening Plants;
- Temporary Offices;
- Weigh Bridge; and

- Storage Yard for storing of equipment.

Operational phase:

Active cells will be marked out and topsoil removed and stored for later use in rehabilitation. Two active cells will be open at any given time. Rehabilitation will be conducted concurrently and the open cell will be kept as small as practically possible (0.5ha each).

The mining method to be used on Barrage Bulk Sand Mine will be strip mining. Mining will take place via a contractor (SPH Kundalila) who will excavate the material, load and haul the material to the processing plant. From the plant the material will be loaded via front end loader directly onto client's trucks. The material will be mined in strips with two strips being open at any given time. The maximum depth of the excavations will be 10 meters in some areas (building sand and gravel) and 5 meters in other areas (plaster sand). Aggregate will be screened before loaded onto client's trucks to remove any debris' contained in the aggregate, the aggregate will also be screened to identify any diamonds found in the product. All activities will be contained within the boundaries of the site.

The proposed mining area is approximately 437.8330ha is extent and the applicant, Tja Naledi – Barrage Bulk Sand Mine, intends to win material from the area for at least 10 years. Silica Sand and Gravel (aggregate) to be removed from the mine will be used for building material in the vicinity.

Application is also being made for alluvial diamonds, in the case that these minerals will be found during mining. If diamonds were found in the aggregate, these will be separated during the screening process and sold to interested buyers. The proposed mine will therefore contribute to the building industry in and around Parys, Vanderbijlpark and Sasolburg area.

A chemical toilet will be established on site to be used by the employees. The existing farm and provincial roads currently used to gain access to the property will be used to transport the aggregate from the mining site to the client. Haul trucks will travel along the existing farm road up to the Vaal Eden road.



Figure 1: Satellite view indicating the proposed access road to the mining site

Decommissioning phase:

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, 2002 (Act No. 28 of 2002).

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 (Please refer to Appendix K).

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.
- 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.
- Ensure that all rehabilitated areas are safe, stable and self-sustaining in terms of vegetation.

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	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
(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)		(E.g. in terms of the National Water Act a Water Use License has/has not been applied for)
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) - Section 102	Amendment of a Mining Right Ref No: FS 30/5/1/1/2/10020MR	Act No. 28 of 2002 Section 102
National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2017	Application for environmental authorisation Ref No: FS 30/5/1/1/2/10020MR	GNR 326 Activity 31
National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) and amendments	Biophysical Environment	Weed / Alien vegetation clearing
Mine Health and Safety Act, 1996 (Act No. 29 of 1996)	The mitigation measures proposed for the site includes specifications of the MHSA	The operational phase of the site will trigger the MHSA
National Heritage Resources Act No. 25 of 1999	Cultural and Heritage Environment	No aspects of the project could be identified that triggers the NHRA.
Free State Nature Conservation Ordinance 8 of 1969	Biophysical Environment	No aspects on site could be identified that needs protection.
Ngwanthe Local Municipality Spatial Planning and Land Use Management By-law 2015	Description of the current land uses	The applicant will submit an application for temporary departure from the zoning provisions in terms of the Land Use Planning Act 3/2014 and the Ngwanthe Local Municipal Land Use Bylaws prior to commencement of the proposed activities.
Free State Town Planning and Land Related By-Laws		
Ngwanthe Local Municipality Integrated Development Plan	Description of the current land uses	

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.
		A lawyers letter has been compiled by Weavind & Weavind Attorneys stating that no land rezoning is needed for this Section 102 application (Appendix L) .

f) Need and desirability of the proposed activities.

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

The increase in building, construction and road maintenance projects in the vicinity of the property triggered the need of the applicant to trade with the available sand, aggregate and alluvial diamonds. The proposed mining will also contribute to the diversification of activities on the property, extending it from agriculture to include small scale mining.

g) Motivation for the overall preferred site, activities and technology alternative.

The proposed site earmarked for the mining of the sand, aggregate and alluvial diamonds 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 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 within neighbouring sand mines, and will minimally affect the community with regards to dust and noise;
- The mineral to be mined is already in sand form and will not need to be blasted in order to loosen the material;
- The mining area can be reached by an existing farm access road that connects to Vaal Eden-Barrage road. 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 (Parys). 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.



h) Full description of the process followed to reach the proposed preferred alternatives within the 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.

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.

The land is currently under cultivated grazing and mixed farming. Two farm houses, a barn and outbuildings are currently present on site. These buildings will not be impacted by mining and are situated in the exclusion zones on the mining plan.

The applicant identified only 1 alternative site for the proposed mining activity namely:

1. **Site Alternative 1 (S1) (Preferred Alternative):** The Applicant, Tja Naledi – Barrage Bulk Sand Mine, currently holds a mining right, 437.8330ha, on Portion 04 of the farm Woodlands 407.



Figure 2: Satellite view showing the position of the Tja Naledi – Barrage Bulk Sand

The site was identified during the assessment phase of the environmental impact assessment (2014 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 within neighbouring sand mines, and will minimally affect the community with regards to dust and noise;
- ✦ The mineral to be mined is already in sand form and will not need to be blasted in order to loosen the material;
- ✦ The mining area can be reached by an existing farm access road that connects to Vaal Eden-Barrage road. 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 (Parys). 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.

No other alternative sites needed to be investigated as this is an amendment of the current EMPR.

2. No-go Alternative:

The 'No Go' option for development was considered. However, this was adjudged to not be the best land-use option for the following reasons: The grazing value of the land is at present considered to be extremely low due to the high level of disturbance, resulting in the area being characterized by non-palatable grasses and low biomass.

The proposed rehabilitation of the area that includes:

- ✦ The preservation of the topsoil to cover disturbed areas;
- ✦ Implementation of measures to monitor the natural establishment of plants growth and to re-vegetate with representative seed mixes in the case of poor plant establishment;
- ✦ The proposed program to combat invader weeds on a regular base; and
- ✦ Will ensure that the land use will remain almost the same when mining operations cease.

The no-go alternative entails no change to the status quo and is therefore a real alternative that needs to be considered.

The 'No Go' option for development was considered. However, this was adjudged to not be the best land-use option for the following reasons: The grazing value of the land is at present considered to be extremely low

due to the high level of disturbance, resulting in the area being characterized by non-palatable grasses and low biomass.

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

- ✎ The applicant will not be able to supply in the demand for building material in the vicinity;
- ✎ The application, if approved, would allow the applicant to utilize the available silica sand, gravel and alluvial diamonds (if found) 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; and
- ✎ The applicant will not be able to diversify the income of the property.

Not proceeding with the proposed operation will entail that a mineral which if mined will contribute towards the local and provincial social and economic structures of the area, will not be mined, and that this opportunity will be lost. It is important to note that as previously discussed, that execution of the mining operation will not leave the land unproductive, so that the proposed mining operation can be considered to be a sustainable land-use option for the area. If the mining project does not go ahead the farm will be used for cultivating grazing and mixed farming. This is also the current use of the land in question.

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 attended 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 submitted an application for environmental authorisation in terms of NEMA, 1998 and the EIA Regulations, 2014 to the Department of Mineral Resources (DMR) in November 2014. DMR granted the applicant permission to apply for the Environmental Impact Assessment process. 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 mining right was granted with reference number: FS 30/5/1/2/2/10020 MR.

An application for a mining right amendment in terms of Section 102 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) [MPRDA] was submitted to the Department of Mineral Resources (DMR), to include alluvial diamonds and gravel into the mining right.

The proposed project triggers the following listed activity 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 a basic assessment process to obtain environmental authorisation for the addition of the crushing and screening plant to the EMPR. I&APs were able to register during the 30-day commenting and registration period that ended on the 9th of October 2017.

Thereafter the Draft Basic Assessment Report was submitted for public review for another 30-day commenting period, ending 20 November 2017.

DMR requested, on the 11th of April, that the Vaaloewer Ratepayers Association be consulted regarding the Section 102 application. The outcome of this consultation is described in detail below. The Vaaloewer Rate Payers Association meeting was held on the 21st of April 2018 at Stonewall Café in the Vaal-Oewer.

The following I&APs and stakeholders were contacted to obtain their comments:

Table 1: Stakeholders

Department	Contact
1. Department of Economic Small Business Development, Tourism and Environmental Affairs (DETEA)	Ms. Gasela P/A Mr Thamela
2. Department of Public Works and Infrastructure	Mr. Mwseoke P/A Ms Kekeletso
3. Department of Agriculture and Rural Development	Mr Mbana Peter Thabethe P/A Ms Mamphona
4. Department of Labor	Mr Nomfundo Douwjack Janine Janse v Rensburg
5. Department of Police, Roads and Transport	Mr S Msibi P/A Timbe
6. Department of Water Affairs & Sanitation	Mr TP Ntili
7. Ngwathe Local Municipality	Mr Pule Tshekedi (Acting) PA
8. Ngwathe Local Municipality WARD 7	Councillor SM Gobidolo.
9. Fezile Dabi District Municipality	Municipal Manager MS LM Molibeli
10. Human Settlements	Head of Department Mr N Mokhesi
11. Department of Co-operative Governance and Traditional Affairs	Head of Department Mr MV Duma
12. Culture, sport and recreation	Head of Department Mr RS Malope
13. SANRAL Regional Offices Eastern Region	Me Judy Marx
14. Eskom	Officer Environmental Management Earl Craig Daniels Land and Rights Officer Phindi Rapudungoane
15. Transnet	Me. Nokukhanya Gabela
16. South African Heritage Resource Agency (Upload on system)	Kathryn Smuts

Table 2: Interested and Affected Parties

PROPERTY DESCRIPTION		I&AP	DESIGNATION
FARM	PTN		
Grysbank and Woodlands 407		Jonathan van Aswegen	Surrounding landowner
Vaal-Eden		Abrie Hannekom	Vaaloewer Ratepayers Association / Protect the Vaal
Wes Vaal		Manie Greef	Surrounding landowner
Onbekend		Trevor van Heerden	Surrounding landowner
		Goose Bay Developments	Manager: Robert Schimpers
		Pure Source Minerals	Contact persons:

PROPERTY DESCRIPTION		I&AP	DESIGNATION
FARM	PTN		
		Mining Co (Pty) Ltd	Venessa Bosman
Vaaldraai		C.J Terblanche Mr. Lawrence Sher	
Woodlands 407		Mark van Wyk	Owner
Winners Point, Woodlands 407		Robert Schimpers	
Woodlands 407, Parys	Portion 4	Mr. PJ van Rensburg	Farm manager
		Mr. Ivan Rensburg	Farm manager
Welbeedgicht 282		P.T.N van Heerden	
Plaas - Damlaagte		Sampie van Rooyen	
Vaal-Eden		Gavin Aboud	Chairperson (Vaalower Ratepayers Association / Protect the Vaal)
Vaal-Eden		Renee de Jong Hartsliet	Vredefort Dome Tourism Association. FS Private Nature Reserve Savannah. Wild Water Conservancy
Vaal-Eden		Tertius Wehmeyer	Protect the Vaal
Vaal-Eden		Warrin Flores	Dome Meteorite Park Conservancy. Vredefort Dome Tourism Association. Vaal Eden Land Care
Vaal-Eden		Mariette Lieferink	PEA and Federation of Sustainable Development
Vaal-Eden		M.A. Oberholzer	Private (ex DMR)
Lindequesdrift		Dina Henstock	Surrounding Landowner
Lindequesdrift & Oorbreetesfontein		Leon van Schalkwyk	Surrounding Landowner
Boschdraai 575-IQ, Kaalplaats 577-IQ Zeekoefontein 573-IQ.	Portion 3,7,13, and the RE Portion 55 Portion	Craig Richardson	Surrounding Landowner
Erina	Portion 4 and Portion 9/2	Allister Cousins	Pont de Vaal Estates
Vaal-Eden		Michelle Warmback	Pont de Vaal Estates
Vaal-Eden		Jason Peter	Pont de Vaal Estates

During the 2014 notification period, neighbours were personally visited to inform them of the proposed project and they were given consultation letter (Please refer to Appendix E). A Background Information Document (BID), for the project summary, was given to the neighbours highlighting the possible impacts from the proposed project and inform them that the EIA and EMPR is available at the Parys Library for perusal. A site notice was placed at the entrance of the farm and an advert in the Parys Gazette to inform the general public to view the EIA/EMPR and to invite comment or to be registered as and I&AP.

On-site notices were placed at the site entrance on the Vaal Eden – Barrage road and in Parys at the local public municipality. The project was also advertised in the Parys Gazette on 7 September 2017. The stakeholders and I&AP's was notified of the availability of the Draft Basic Assessment Report (DBAR) for their perusal. A 30 days commenting period was allowed for the perusal of the document that ended on the 20th of November 2017. Comments received on the document was added to the Final Basic Assessment Report (FBAR) for DMR to review. See attached as Appendix E proof that the stakeholders and I&AP's were contacted.

DMR requested, on the 11th of April, that the Vaaloewer Ratepayers Association be consulted regarding the Section 102 application. The outcome of this consultation is described in detail below. Please also refer to Appendix E for the DMR request letter as well as the meeting minutes that was taken during the meeting that was held between Vaaloewer Ratepayers Association, SPH / Tja Naledi and Greenmined Environmental.

iii) Summary of issues raised by I&APs

(Compile the table summarising comments and issues raised, and reaction to those responses)

During the first public participation process that was conducted in 2014, various means of consultation was used to consult and get I&APs to register as such, only one letter was received back indicating no objection to the proposed mine form the neighbouring farm manager. Two phone calls were received on the first day after the placement of the advertisement these two calls related to a person looking for sand to buy (potential client) and a person looking for employment. Please refer to the table below for the current PPP.

During the 2017 public participation, only comment was received on the 22nd of November by Sampie van Rooyen. This comment was not included into the first submission of the FBAR to DMR, as this comment was late and out of the allowed commenting period. However, this comment has now been included and addressed in the report, together with the comments received from Vaaloewer Ratepayers Association.

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
<p>List the name of persons consulted in this column, and</p> <p>Mark with an X where those who must be consulted were in fact consulted</p>				
AFFECTED PARTIES				
Landowner/s				
Dr. S Jacobs	N/A	N/A	N/A	N/A
Lawful occupier/s of the land				
Mr. PJ van Rensburg Mr Ivan van Rensburg	N/A	N/A	N/A	N/A
Landowners or lawful occupiers on adjacent properties				
Johnathan van Aswegen	N/A	N/A	N/A	N/A
Manie Greeff	N/A	N/A	N/A	N/A
Trevor van Heerden	N/A	N/A	N/A	N/A
Goose Bay Developments / Pure Source Minerals Mining Co (Pty) Ltd	N/A	N/A	N/A	N/A
Municipal councillor				
Ngwathe Local Municipality Ward (7) Councillor	N/A	N/A	N/A	N/A
Municipality				
Ngwathe Local Municipality – Mr. Pule Tshekedi	N/A	N/A	N/A	N/A
Fezile Dabi District Municipality – Ms LM Molibedi	N/A	N/A	N/A	N/A
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e				
Department of Public Works and Infrastructure – Mr, Mwseoke	N/A	N/A	N/A	N/A
Department of Police, Roads and Transport – Mr. S Msibi	N/A	N/A	N/A	N/A
SANRAL – Me Judy Marx	N/A	N/A	N/A	N/A
Eskom – Mr. Earl Craig Daniels	N/A	N/A	N/A	N/A
Transnet – Mr. Nokukhanya Gabela	N/A	N/A	N/A	N/A
Communities				

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	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
	N/A	N/A	N/A	N/A
Dept. Land Affairs				
Commission of restitution of Land Rights – Vuyane Tshawane	21/09/2017	No land claims on Woodlands 407.	N/A	N/A
Traditional Leaders				
	N/A	N/A	N/A	N/A
Dept. Environmental Affairs				
Department of Economic Small Business Development, Tourism and Environmental Affairs (DETEA) – Ms Gasela	N/A	N/A	N/A	N/A
Other Competent Authorities affected				
Department of Agriculture and Rural Development – Mr. Mbana Thabethe	5/10/2017	No objections to the amendment of the existing mining right. The following must be taken into consideration during and after the mining activities: <ul style="list-style-type: none"> • Soil erosion must be prevented • All disturbed parts of the farm must be rehabilitated after mining has been completed. 	Noted Management measures will be incorporated into the management plan	N/A
Department of Rural Development and Land Reform – Mr. RA Ryan	13/10/2017	No objections as this is not State Land. Conditions is that the approval is granted by other State organs in this regards.	Noted.	N/A
Department of Labour – Mr. Nomfundo Douwjack	N/A	N/A	N/A	N/A
Department of Water Affairs and Sanitation – Mr. TP Ntuli	N/A	N/A	N/A	N/A
Department of Human Settlements – Mr. N Mokhesi	N/A	N/A	N/A	N/A
Department of Co-Operative Governanace and Traditional Affairs – Mr. MV Duma	N/A	N/A	N/A	N/A
Department of Culture, Sport and Recreation – Mr. RS	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	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Malope				
SAHRA – Ms. Kathryn Smuts	N/A	N/A	N/A	N/A
OTHER AFFECTED PARTIES				
Vaal Oewer Ratepayers Association	6/04/2018 – 11/05/2018	<p><u>Gavin Aboud:</u> There is already a screening plant onsite, and not in the current mining plan. Hence your current application. This is extremely presumptuous, and you are requested to remove said equipment until this process is completed.</p>	<p>Screening Plant: Quintin van der Merwe (QM) explained during the Meeting held on the 21st of April why the screen plant was there, QM states that as Dr. Stephen Jacobz (SJ) mentioned, we are all business men and woman here. Therefore, the screen plant being there was a business decision. QM states that the screen plant came from a project called Aggenys, the screen plant was placed at this mine and will sit there until the amendment has been approved. QM states that as the safety officer, he stopped any use of the screening plant in order to remain compliant and prevent DMR from closing them down or receiving any fines. QM states that he followed the EMP and said that no screening may take place at that point.</p>	N/A
		<p><u>Tertius Wehmeyer and Renee Hartsliet:</u> Please be so kind as to provide the other documentation Tertius requested. I am particularly interested in the consultation and public participation documentation:</p> <p>Please be so kind to forward:</p> <ol style="list-style-type: none"> 1. The number of the mining permit or mining right for this mine. 2. A copy of mining permit / right 3. A copy of the Section 10 Notice for this mine sent out by your office. 4. Copies of public documents such as the EIA, EMP, EMPR, Proof of Consultation and Public Participation, Scoping Report and Heritage Impact Assessment. <p>If they, SPH, have been contracted by any other mine to provide services for them, please provide detail requested above for that mine as well as the registered mine name and mine owner.</p> <p>On 29 November 2014, I registered myself, the FS Private Nature Reserve Savannah, and the Wild Water Conservancy as IAPs with the consultant Monty van Eeden of Dorean in the Tja Naledi mine application. Due to the comprehensive rehabilitation plan, distance from the Vaal River, and small scale of the operation, as contained in the BID document we received, we did not object at that time to the mining.</p> <p>However, it appears that the rehabilitation did not take place as promised. Further, the scale is proposed to be greatly increased and the highly-stressed</p>	<p>Document Request: The FBAR documentation was supplied to the committee on 11 April that included all the requested documentation.</p> <p>Registration: Please refer to Appendix A, Tertius Wehmeyer Email, that also answers all the questions Tertius Wehmeyer brought up on 17 April. This has also been discussed telephonically on the 20th of April 2018 Please note that your registration was not listed in the current approved EMP for Tja Naledi, therefore you have not been consulted during the Section 102 Amendment. There was no proof of correspondence with you in the current mining right application. It seems that you have not been registered during the 2014 mining right. After the meeting held on the 21st of April,</p>	N/A N/A to Section 102 Amendment.

<p>Interested and Affected Parties</p> <p>List the name of persons consulted in this column, and</p> <p>Mark with an X where those who must be consulted were in fact consulted</p>	<p>Date Comments Received</p>	<p>Issues raised</p>	<p>EAPs response to issues as mandated by the applicant</p>	<p>Section and paragraph reference in this report where the issues and or response were incorporated.</p>
		<p>Vaal River is being encroached upon. I question the efficacy of your dust mitigation proposal, your statements about noise pollution and whether due diligence has been paid to the road and bridge capacities for transport trucks. Also, has a proper public participation process been followed regarding the rezoning of the land? It would be helpful to receive answers to these questions in advance of any meeting with the Protect Vaal Eden committee or the public.</p> <p>Finally, please note that the registered IAP's mentioned above were NEVER contacted regarding the new application and I hereby object in the strongest terms to any new application, on those grounds alone.</p>	<p>Yolandie Coetzee, the EAP for Greenmined Environmental consulted with Dorean Environmental. Monty from Dorean confirmed that Renee was never registered as she did not respond to the Tja Naledi project. Monty and Renee Hartsliet had telephonic conversations regarding the Tja Naledi Project. She did however respond to the Sweet Sensations project and registered word that Mining Right. The only comment that was made by Renee for Tja Naledi was to determine if trucks will drive past her property. Whereby Dorean replied that they will not. He asked her to put everything in writing and no response was received.</p> <p>Rehabilitation: This issue has also been addressed in the meeting presentation. This is not applicable to the Section 102 application.</p> <p>Dust: Dust monitoring will be conducted on a monthly basis together with wind roses. A dust management plan will be compiled for this project. A 10 000l water cart is on site to be used for dust suppression and a water canon is suppressing the stockpiles. SPH have appointed an occupation hygienist as per the OHS to conduct the gravimetric noise testing done. This has been addressed during the meeting.</p> <p>Noise: Noise monitoring station will be set up at Craig Richardson farm to measure the levels of noise</p>	<p>N/A to Section 102 Amendment.</p> <p>Addressed in Part A – 3(h) iiv), (ix) (j) and Part B – 1(d, e, and Ff))</p> <p>Addressed in Part A – 3(h) iiv), (x) (j) and</p>

<p>Interested and Affected Parties</p> <p>List the name of persons consulted in this column, and</p> <p>Mark with an X where those who must be consulted were in fact consulted</p>	<p>Date Comments Received</p>	<p>Issues raised</p>	<p>EAPs response to issues as mandated by the applicant</p>	<p>Section and paragraph reference in this report where the issues and or response were incorporated.</p>
			<p>from Tja Naledi. Personal dust and noise monitoring is being conducted, which forms part of the Mine Health and Safety Act. SPH have appointed an occupation hygienist as per the OHS to conduct the gravimetical noise testing done. This concern will be investigated further to minimise noise in the mining area.</p> <p>Road Integrity: Going forward, together with other sand mines in the area, which will be using the same road (Sweet Sensation and Pure Source Minerals), a strategy will be developed to assist in road repairs once the Section 102 mining right has been approved for Barrage Bulk Sand Mine. Roads Department is currently busy with an analysis of the road integrity and the sand mines. Once finalized a negotiated plan between BBSM, Pure Source Minerals, Sweet Sensations and the roads department will be discussed and a plan implemented.</p> <p>Bridge: The Roads Department informed SPH Kundalila that the Barrage Bridge was built to hold the capacity of the heaviest legal load on national roads, as the bridge is built over a national road. - 120 tons' maximum payload. Vaal-Eden Bridge loads will be investigated.</p> <p>Rezoning: Dr. S Jacobs is awaiting documentation from lawyers stating that no rezoning needs to be conducted.</p>	<p>Part B – 1(d, e, and Ff))</p> <p>Addressed in Part A – 3(h) iiv), (x) (j) and Part B – 1(d, e, and Ff))</p> <p>Addressed in Part A – 3(h) iv), (x) (j) and)(b) Part B – 1(d, e, and Ff))</p> <p>Addressed in Part A – 3(h) iv), (x) (j) and)(b) Part B – 1(d, e, and Ff))</p>

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	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
		<p>Gavin Aboud:</p> <p>At this point my only comment is that the public participation process was flawed, and that given the required amendments in terms of minerals to be mined and the amendment in the Mining Plan, the PPP must be redone.</p> <p>You are not meeting with the Vaaloewer Ratepayers Association, you are meeting with the Protect Vaal Eden Committee, we represent the complete area around the mine, which incorporates three provinces, Gauteng, Free State, and North West.</p>	<p>The PPP that reference was made to was regarding the mining right. This is not applicable to the Section 102 amendment.</p> <p>Noted. As per DMR's request.</p>	N/A to Section 102 Amendment.
		Surrounding neighbours of the Vaal-Oewer where invited to the meeting.	<p>In terms of Regulation 41(2)(b)(ii) of the Amendments to the Environmental Impact Assessment Regulations, 2014 the person conducting a public participation process must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by giving written notice, in any manners provided for in section 47D of the Act (NEMA), to <u>owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken.</u></p> <p>Therefore, in terms of the regulations, we were not obliged to contact you, as your land is not adjacent to the site.</p> <p>However, you have been registered as an I&AP during this current PPP with the Vaal Oewer Association.</p>	N/A to Section 102 Amendment.
		<p>Tertius Wehmeyer:</p> <p>At the outset I want to state that the public participation process conducted by yourself and your company Greenmined, is in my view not in line with the NEMA act, regulations and guidelines and I will set out my reasons in the email below. Just ask yourself this question: "Why would an international Environmental Consultancy like SLR Consulting (https://slrconsulting.com/za/ & https://slrconsulting.com/za/slr-documents/goosebay-sand-gravel-and-diamond-project-1-1-1) have a list of over 800 I&APs excluding government departments and Greenmined, a small local environmental consultancy with a website under construction (http://www.greenmined.com/index.php), have an I&AP list of only 10 people (excluding government departments) which includes at least 2 owners of Tja Naledi Beafase Holdings, the applicant, and also owners / employees of the two other sandmines, for the public participation process of two neighbouring sandmines with a very similar profile?"</p> <p>Was that because SLR followed the latest (2017) DEA Public Participation Guideline which encourages the public participation process to be as inclusive as possible (https://www.environment.gov.za/sites/default/files/docs/publicparticipationguideline_intermsofnemaEIAregulations.pdf) and possibly followed the Funnel</p>	Please refer to Appendix E for the letter to address the comments made by Tertius Wehmeyer.	Appendix E

<p>Interested and Affected Parties</p> <p>List the name of persons consulted in this column, and</p> <p>Mark with an X where those who must be consulted were in fact consulted</p>	<p>Date Comments Received</p>	<p>Issues raised</p>	<p>EAPs response to issues as mandated by the applicant</p>	<p>Section and paragraph reference in this report where the issues and or response were incorporated.</p>
		<p>Approach as outlined in this paper at http://www.thegreenconnection.org.za/dmdocuments/Public Participation in EIAs.pdf by Liz McDaid (Green Connections) and Lynette Kruger (Environmental Evaluation Unit, UCT)? In contrast, it seems to me as if Greenmined spoke to as few members of the public as possible and then also to only people who welcomed the changes to TNB's mining right. But of course, size does not always matter and possibly Greenmined and not SLR followed the correct approach. However, it is my contention that SLR's approach is more correct, although not flawless in our experience. I give my reasons below.</p> <p>Firstly, for those who are not aware of what Regulation 41 of the NEMA act is about, it regulates the Public Participation process with regards to interested and affected parties. In subsection (2) of regulation 41 it states that "The person conducting a public participation process <u>must</u> take into account <u>any relevant guidelines applicable to public participation as contemplated in section 24J</u> of the Act and <u>must</u> give notice to <u>all potential interested and affected parties</u> of an application or proposed application which is subjected to public participation by ..." and then list 5 main categories of methods of giving notice summarised below:</p> <ul style="list-style-type: none"> - Regulation 41 (2) (a) - fixing a notice board in a place accessible and conspicuous to the public at mining site. (Not shown in FBAR document) - Regulation 41 (2) (b) - written notices to at least 6 categories of individuals / organisations (FBAR only alludes to written notices to residents / owners of farm on the mining site itself and some adjacent farms, examples of written notices are not provided) - Regulation 41 (2) (c) - placing an advertisement in a local newspaper or an official gazette published specifically to provide public notice of applications or other submissions made in terms of these regulations (the FBAR document Appendix E lists Parys Gazette of 7 September 2017 but does not provide a copy of the advertisement) - Regulation 41 (2) (d) - placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is (PLEASE NOTE that due to the fact that the mine lies in a tripoint area where THREE provinces (Free State, Gauteng & North-West) meet and the fact that the mining activity may impact on these areas, this subsection IS relevant) - Regulation 41 (2) (e) - using reasonable alternative methods, as agreed to by the CA, in those instances where a person is desirous of but unable to participate in the process due to illiteracy, disability or any other disadvantage (there is an informal settlement next to Vaaloewer which may fall in this category). <p>Furthermore, the definitions of "interested and affected party" and the "public participation process" are also critical in interpreting the NEMA act, regulations and guidelines. In the NEMA act, these concepts are defined as follows:</p> <p>"interested and affected party", for the purposes of Chapter 5 and in relation to the assessment of the environmental impact of a listed activity or related activity, means an interested and affected party contemplated in section 24(4)(a)(v), and which includes-</p> <ul style="list-style-type: none"> (a) any person, group of persons or organisation <u>interested in</u> or <u>affected by</u> such operation or activity; and (b) <u>any organ of state</u> that may have jurisdiction over any aspect of the operation or activity; <p>"public participation process", in relation to the assessment of the environmental impact of any application for an environmental authorisation, means a process by which potential interested and affected parties are given opportunity to comment on, or raise issues relevant to, the application</p> <p>Section 24 deals with Environmental Authorisation. Section 24(4)(a)(v) mentioned in the definition of "interested and affected parties" above, reads as follows:</p>		

<p>Interested and Affected Parties</p> <p>List the name of persons consulted in this column, and</p> <p>Mark with an X where those who must be consulted were in fact consulted</p>	<p>Date Comments Received</p>	<p>Issues raised</p>	<p>EAPs response to issues as mandated by the applicant</p>	<p>Section and paragraph reference in this report where the issues and or response were incorporated.</p>
		<p>"Section 24 (4) Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment –</p> <p>(a) must ensure, with respect to every application for an environmental authorisation—</p> <p>(v) public information and participation procedures which provide <u>all interested and affected parties</u>, including <u>all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity</u>, with a <u>reasonable opportunity to participate</u> in those information and participation procedures; and</p> <p>Yolandie, in your reply to Allister Cousins from Pont de Val, you stated (text in blue and "" below) that you were not obliged to contact him through a written notice.</p> <p>"In terms of Regulation 41(2)(b)(ii) of the Amendments to the Environmental Impact Assessment Regulations, 2014 the person conducting a public participation process must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by giving written notice, in any manners provided for in section 47D of the Act (NEMA), to <u>owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken</u>.</p> <p>Therefore, in terms of the regulations, we were not obliged to contact you, as your land is not adjacent to the site. However, you have been registered as an I&AP during this current PPP with the Vaal Oewer Association."</p> <p>Although your statement is correct in a minimalist approach to the NEMA act and regulations with regards to a WRITTEN notice to Pont de Val residents / owners, as Pont de Val on farm Erina is not a neighbouring property, this is only 1 of all the methods of notification listed in Regulation 41! Also, written notices had to be issued to other neighbouring properties to Woodlands 407 (like Vaaloewer and other neighbouring farms across the Vaal River adjacent to Woodlands 407, Mr Abrie Hanekom of farm De Fonteine 189 (between De Pont and Woodlands 407)) AS WELL AS any organisation of ratepayers (see Regulation 41(2)(b)(iii)) that represent the community in the area. This was clearly not done.</p> <p>If Greenmined used the 2017 DEA "PUBLIC PARTICIPATION GUIDELINE IN TERMS OF NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 ENVIRONMENTAL IMPACT ASSESSMENT REGULATIONS" as CLEARLY instructed in the introductory part of Section 41 (2), then you would have been familiar with Section 6 of the Guideline quoted below:</p> <p>"6. GUIDANCE ON THE LEVEL OF PUBLIC PARTICIPATION</p> <p>The <u>minimum requirements for public participation outlined in the EIA Regulations</u> will not necessarily be sufficient for all applications. This is because the circumstances of each application are different, and it may be necessary in some situations to incorporate extra steps in the PPP. The table below provides guidance for deciding on the required level of PP."</p> <p>Table 1 list 3 main categories with 16 different situations that might be applicable in an area with regards to an Environmental Authorisation. In my view, only 2 of the situations are not applicable to our area and your current environmental authorisation process. So that indicates to me that the public participation process should be as wide and as inclusive as possible. The public participation process outlined in the FBAR document supplied, fails dismally in this respect. Noticeable omissions were known I&APs such as Mr Abrie Hanekom on a neighbouring farm, who you alleged to have contacted but who cannot recall any such contact and you do not provide proof of it. Me Renee de Jong Hartslielief owner of farm Savannah and co-chair of Friends of the Vredefort Dome was also a registered I&AP for the application for a mining right of Tja Naledi Beafase who should have been contacted. Others are the residents of Vaal Eden (those not contacted), Vaaloewer and Lindequesdrift as well as government structures in North-West province, Tlokwe LM, Gauteng province and Emfuleni LM as these mines falls close to the border of 3 provinces.</p>		

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	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.																				
		<p>Lastly, please respond to the following:</p> <ol style="list-style-type: none"> 1. Provide copies or photographs of all notices (e.g. notice boards, newspaper adverts, letters to I&APs etc) that were used in the public participation process for the Basic Assessment Report required for TNBH Section 102 application. In the FBAR document, it is stated (see screenshot below) that these documents are contained in Appendix A which only contains maps! If you have copies, also copies of all section 10 notices 2. How did you contact Mr Abrie Hanekom on 8 September 2017 as stated in 1st table of Appendix E (Comments and Response Report)? He is a member of our committee and was completely unaware of this Environmental Authorisation until he noticed the Barrage Bulk Sands board (which contains NO information about the owners of the mine, Tja Naledi Beafase Holdings) a week before my email to Mr Mulaudzi. Please provide proof of contact. See 2nd screenshot below of 1st table in Appendix E. 3. Mining Right Number, and copy of the Mining Right 4. Copy of the EIA/EMP as well as annexures (to include the PPP and specialist studies) <p>Items 3 and 4 were offered in your first email to me but I haven't received any yet.</p> <p>The rest of the issues raised we can discuss in our meeting on Saturday although you are welcome to respond before the meeting.</p>																						
		<p>Bob Hartsliel: For the sake of clarity and in preparation for Saturdays meeting with you.</p> <p>1.Are these 9 listed parties below the ONLY affected parties you contacted with regard to this license application:</p> <p style="text-align: center;">NOTIFICATION OF LANDOWNER AND NEIGHBOURS AND OTHER I&AP'S</p> <table border="1" data-bbox="608 1224 1023 1585"> <thead> <tr> <th>Name</th> <th>Organisation</th> </tr> </thead> <tbody> <tr> <td>Mr Jonathan van Aewegen</td> <td>Grysbank and Woodlands 407 Surrounding Land Owner</td> </tr> <tr> <td>Mr Abrie Hanekom</td> <td>Surrounding Land Owner</td> </tr> <tr> <td>Mr Marie Greef</td> <td>Willow Grange Surrounding Land Owner</td> </tr> <tr> <td>Mr Trevor van Heerden</td> <td>Welbedagt Surrounding Land Owner</td> </tr> <tr> <td>Ms Venessa Bosman</td> <td>Pure Source Minerals Mining Co (Pty) Ltd</td> </tr> <tr> <td>Mr SE van Rooyen</td> <td>Damlaagte Surrounding Land Owner</td> </tr> <tr> <td>Mr PJ van Rensburg</td> <td>Woodlands 407 Surrounding Land Owner</td> </tr> <tr> <td>Mr PC Rensburg</td> <td>Woodlands 407 Surrounding Land Owner</td> </tr> <tr> <td>Mr L Koekemoer</td> <td>Woodlands 407 Surrounding Land Owner</td> </tr> </tbody> </table> <ol style="list-style-type: none"> 2. <u>Did</u> you contact the local Ngwathe ward councillor or inform him in any way of this application and if so please provide proof thereof? 3. <u>Did</u> you contact the Ngwathe Mayor or inform her in any way of this application and if so please provide proof thereof? 4. <u>Did</u> you contact the local Fezile Dabi ward councillor or inform him in any way of this application and if so please provide proof thereof? 5. <u>Did</u> you contact the Fezile Dabi Mayor or inform her in any way of this application and if so please provide proof thereof? <p>PLEASE BE ADVISED THAT ALL FOUR OF THE ABOVE MENTIONED PERSONS HAVE BEEN INVITED TO OUR MEETING SATURDAY</p>	Name	Organisation	Mr Jonathan van Aewegen	Grysbank and Woodlands 407 Surrounding Land Owner	Mr Abrie Hanekom	Surrounding Land Owner	Mr Marie Greef	Willow Grange Surrounding Land Owner	Mr Trevor van Heerden	Welbedagt Surrounding Land Owner	Ms Venessa Bosman	Pure Source Minerals Mining Co (Pty) Ltd	Mr SE van Rooyen	Damlaagte Surrounding Land Owner	Mr PJ van Rensburg	Woodlands 407 Surrounding Land Owner	Mr PC Rensburg	Woodlands 407 Surrounding Land Owner	Mr L Koekemoer	Woodlands 407 Surrounding Land Owner	<p>Please refer to Appendix E for the letter that was send to Bob Hartsliel.</p>	<p>Appendix E</p>
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		<p>6. Which of the following Members of the Free State Executive Council did you inform of this application:</p> <ul style="list-style-type: none"> a. MEC of TOURISM b. MEC of FINANCE c. MEC of AGRICULTURE d. MEC of ROADS e. MEC of ENVIRONMENTAL AFFAIRS f. MEC of ECONOMIC AFFAIRS <p>Please submit copies of the notifications you sent these MEC; s prior to our meeting on SATURDAY.</p> <p>7. Did you or anyone from your firm advise or contact the FREE STATE Premier in any way in regard to this application and if so please send copy of such advices.</p> <p>8. Did you or anyone from your firm advise or contact M/s Seipati Dlamini of DMR about this application in any way?</p> <p>9. What is the present land zoning of your client's property?</p> <p>10. Are you and/or anyone in your firm aware of the Constitutional Court Ruling of April 12. 2012 in the case of Mac Sands VS Cape Town City?</p> <p>11. What is the relationship between Mr PJ van Rensburg -Mr PC Rensburg -Mr L Koekemoer - Mr Jonathan van Aswegan ? Listed IAPS? They all seem to be owners of Woodlands 407??</p> <p>I have not been able to ascertain who your clients 26% community/BEE partner is (as per mining Charter requirement)—could you please advise us who that is?</p>		
		<p>1. Why do the mining applicants not apply for rezoning first? The Vaal Eden Road S171 is in our IDP / SDF as a scenic route and Gauteng gateway to the Vredefort Dome World Heritage Site. Sand and gravel mining is supposed to take place near Sasolburg, along the R59...</p> <p>2. Why do the water use applications seem to also lag behind? The critically-stressed Vaal River and its water table is the lifeline of Parys and VDWHS.</p> <p>3. Why is rehabilitation of prior mining activity seemingly not taken into account before a new permit is issued?</p> <p>4. Why do the applicants change their company names?</p>	<p>1. Why do the mining applicants not apply for rezoning first? The Vaal Eden Road S171 is in our IDP / SDF as a scenic route and Gauteng gateway to the Vredefort Dome World Heritage Site. Sand and gravel mining is supposed to take place near Sasolburg, along the R59... This is a process that is follow by the local municipalities guidelines and spatial planning. During PPP the municipality will inform the applicant that rezoning needs to be conducted. This is an historical mine. So the IDP needs to accommodate historic mines.</p> <p>2. Why do the water use applications seem to also lag behind? The critically-stressed Vaal River and its water table is the lifeline of Parys and VDWHS. We cannot answer for any delays in the Departments.</p> <p>3. Why is rehabilitation of prior mining activity seemingly not taken into</p>	<p>N/A to Section 102 amendment.</p>

<p>Interested and Affected Parties</p> <p>List the name of persons consulted in this column, and</p> <p>Mark with an X where those who must be consulted were in fact consulted</p>	<p>Date Comments Received</p>	<p>Issues raised</p>	<p>EAPs response to issues as mandated by the applicant</p>	<p>Section and paragraph reference in this report where the issues and or response were incorporated.</p>
			<p>account before a new permit is issued? We cannot answer for any other mining companies. This is not applicable to the Section 102 amendment.</p> <p>4. Why do the applicants change their company names? This is not applicable to the Section 102 amendment.</p>	
		<p>Reference is made to the BID. Page 4 Heading Noise refers. Here you cover the issue regarding blasting, yet in the meeting you said there would be nothing.</p>	<p>Blasting: The BID (Background Information Document, the reference to the document that was made) was compiled to cover all the basis for the project. During the Basic Assessment that was conducted for the site numerous sample holes were dug and no rock beds were encountered. Therefore, no blasting will take place at Tja Naledi. There will be no explosives magazine on site. This is also the reason that no reference is made to blasting in the Basic Assessment Report.</p>	
		<p>Allow me to subjoin hereunder preliminary comments prior to the proposed public participation process pursuant to our meeting on Saturday.</p> <p>Land Use</p> <p>I have transmitted a document on Saturday to the above e-mail address. I received a notification that it miscarried. It is the legal opinion we obtained regarding the legal requirements for the rezoning of agricultural land within the Free State Province to mining land. Kindly confirm whether you have received it. I nonetheless attach it hereto.</p> <p>Sense of Place</p> <p>During our discussion on Saturday, I referred to sense of place and the legal precedent which was established in DIRECTOR: MINERAL DEVELOPMENT, GAUTENG REGION, AND ANOTHER v SAVE THE VAAL ENVIRONMENT AND OTHERS 1999 (2) SA 709 (SCA). I attach a summary of the judgment hereto as well as the guideline document on "Sense of Place". I am of the considered opinion that it has particular relevance to the current application under consideration.</p>	<p>Land Use: Received thank you.</p> <p>Sense of Place: Noted.</p>	<p>Addressed in Part A – 3(h) iv), (1) (a), (b), (d) and Appendix H</p> <p>Addressed in Part A – 3(i)</p>

<p>Interested and Affected Parties</p> <p>List the name of persons consulted in this column, and</p> <p>Mark with an X where those who must be consulted were in fact consulted</p>	<p>Date Comments Received</p>	<p>Issues raised</p>	<p>EAPs response to issues as mandated by the applicant</p>	<p>Section and paragraph reference in this report where the issues and or response were incorporated.</p>
		<p>Biodiversity Priority Area</p> <p>May I furthermore kindly request whether the mining area falls within a 1:100-year flood line or within 500 meters of a water course (that is the delineated wetland area) or within a FEPA and a 1 km buffer around the FEPA, critical biodiversity area (or equivalent areas) from the provincial spatial biodiversity plans or critically endangered and endangered ecosystems in terms of the Mining and Biodiversity Guideline? I infer from the SANBI Map that it falls within a River FEPA & associated sub-quaternary catchment.</p> <p>If my inference is correct the mining application is within a highest biodiversity importance area with the highest risk for mining. The likelihood of a fatal flaw for mining is very high because of the significance of the biodiversity features in this area and the associated ecosystem services.</p> <p>This mining application under consideration therefore resolves around the issue of mining in a sensitive area. This must be dealt in accordance with the <u>Mining Biodiversity Guidelines</u> and must be utilised in the evaluation of the <u>Best Practicable Environmental Option (BPEO)</u>.</p> <p>The balancing of the negative environmental impacts versus the alleged short term social benefits and the economic advantages can only be assessed if the loss to the environment is evaluated. This appraisal ought to be conducted with the guidance of <i>inter alia</i> the Mining Biodiversity Guideline and the taking into consideration of the opportunity costs.</p> <p>According to the Mining and Biodiversity Guideline the importance of the biodiversity features in these areas and the associated ecosystem services is sufficiently high to prohibit mining in these areas. Given the very high biodiversity importance, the Guideline states that an EIA conducted in respect of such an area should include the strategic assessment of optimum, sustainable land-use for a particular area which should determine the significance of the impact on biodiversity. The EIA must take into account the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining as well as the potential strategic importance of the minerals to the country.</p> <p>The Guideline states that the EIA “needs to identify whether mining is the optimal land use, whether it is in the national interest for that deposit to be mined in that area and whether the significance of unavoidable impacts on biodiversity are justified. It is important that a risk averse and cautious approach is adopted. This implies strongly avoiding these biodiversity priority areas, given the importance of the receiving environment and the probability that the proposed activity would have significant negative impacts”.</p> <p>When considering mining within these biodiversity priority areas, the Guideline prescribes a set of filters that should be sequentially applied and "mining should only be considered if:</p> <ol style="list-style-type: none"> <i>It can be clearly shown that the biodiversity priority area coincides with mineral or petroleum reserves that are strategically in the national interest to exploit.</i> <i>There are no alternative deposits or reserves that could be exploited in areas that are not biodiversity priority areas or less environmentally sensitive areas.</i> <i>It can be demonstrated that they are spatial options in the landscape that could provide substitute areas of the same habitat conservation, to</i> 	<p>Biodiversity Priority area:</p> <p>The mining area does not fall within the 1:100 year floodline, or is located within 500m from the watercourse. Therefore, this is not applicable. The mining area is located 900m from the watercourse.</p> <p>An Environmental Impact Assessment has been conducted for the Barrage Bulk Sand Mine.</p>	<p>N/A</p> <p>Please refer to Part A, 3, v)</p>

<p>Interested and Affected Parties</p> <p>List the name of persons consulted in this column, and</p> <p>Mark with an X where those who must be consulted were in fact consulted</p>	<p>Date Comments Received</p>	<p>Issues raised</p>	<p>EAPs response to issues as mandated by the applicant</p>	<p>Section and paragraph reference in this report where the issues and or response were incorporated.</p>
		<p><i>ensure that biodiversity targets would be met.</i></p> <p><i>d. A full economic evaluation of mining compared with other reasonable/feasible alternative land uses, undertaken as a necessary component of the EIA, shows that mining would be the optimum sustainable land use in the proposed area.</i></p> <p><i>e. A detailed assessment and evaluation of the potential direct, indirect and cumulative impacts of mining on biodiversity and ecosystem services shows that there would be no irreplaceable loss or irreversible deterioration, and that minimising, rehabilitating, and offsetting or fully compensating for probable residual impacts would be feasible and assured, taking into account associated risks and time lags.</i></p> <p><i>f. A risk averse and cautious approach, taking into account the limits of current knowledge about the consequences of decisions and actions, can be demonstrated both in the assessment and evaluation of environmental impacts, and in the design of proposed mitigation and management measures.”</i></p> <p>The Guideline states further that <i>“the above filters should form the basis for deciding on whether or not, and how and where, to permit mining. This means that based on the significance of the impact, some authorisations may well not be granted. If granted, authorisation may set limits on allowed activities and impacts, and may specify biodiversity offsets that would be written into licence agreements and/or authorisations.</i></p> <p>The original (2014) EIA/EMP ought to have been compiled so as to give effect to the Guideline and the decision maker should have considered the Guideline in deciding whether or not to grant environmental authorisation. Since we were not consulted during the 2014 process, I am unsure whether or not the Guidelines were considered by the decision maker.</p> <p>The fact is that sand is plentiful on South Africa, it is overproduced and the sensitive environment is neither of the aforesaid. It would not have been possible to make an informed decision if this information, dealing specifically with the matters raised in the Mining Biodiversity Guideline, was lacking.</p> <p>This includes an assessment of the opportunity costs, e.g.:</p> <ul style="list-style-type: none"> o Understanding the value of the foregone opportunity; o The achievement of the desired aim/goal for the specific area; o Optimising of positive impacts; o Minimising of negative impacts; o Equitable distribution of impacts; and o The maintenance of ecological integrity and environmental quality. <p>Applying the “opportunity cost” principle would change the question being asked, namely, by placing a positive duty upon the decision maker to consider if the development constituted the best use of the resources (i.e. the best practicable environmental option).</p> <p>The decision maker must make a decision based upon the following premise:</p> <p>a. If we, as a country, are to mine all minerals (and in the case under consideration, sand) in the ground, then there should be no regard for the</p>	<p>These guidelines where considered both during the 2014 and 2017 assessment.</p> <p>DMR is the decision maker.</p> <p>Noted and send.</p>	

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	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
		<p>environment since all of South Africa, as a resource rich country, will in any event be mined.</p> <p>b. If, however, not all minerals are to be mined and some will be left in the ground, then a decision on which areas to mine and the areas in which to leave the minerals in the ground, should be made.</p> <p>It is our submission that the first scenario is not sustainable and thus not an option. The second scenario is of direct application in this matter under consideration. The decision must reflect the guidelines in such a situation, as well as the lack of information before the decision maker in the documentation dealing with such a scenario.</p> <p>The decision will have to balance the above-mentioned factors at the hand of the EIA Regulations and other guidelines, including the Mining Biodiversity Guideline.</p> <p>The reasons for the decision maker's decision will have to address these issues in detail in order to justify the decision.</p> <p>In order to ripen our judgement, may I kindly request an electronic copy of the 2014 EIA/EMP and the environmental authorisation?</p> <p>Water Use Licence</p> <p>And finally, during our meeting on Saturday it was stated that an application for a Water Use License (WUL) was submitted in 2017. I recollect that it was also stated during the meeting that the water uses in terms of section 21 of the National Water Act (36 of 1998) (NWA) will not be triggered by the mine's activities. If my recollection is correct, it begs the question why the Application considered it necessary to apply for a WUL?</p>	<p>Water Use Licence:</p> <p>An application for general authorisation was submitted to DWS for the abstraction of water from the two (2) boreholes located on site. One borehole for use for potable water, and the other for dust suppression on site.</p> <p>Therefor a section 21a will be triggered.</p>	
INTERESTED PARTIES				
Sampie van Rooyen	20/09/2017 – Registration as I&AP5 22/11/2017	<ul style="list-style-type: none"> ■ The condition of the tar road leading to Vaal Eden is considered to be heavily degraded, on account of potholes. This road however is used by both the mine, as well as the local farming community. This specific tar road is not constructed to handle the current traffic volumes, consisting mainly of heavy vehicles. Prior to upgrading of the mine, the local farming community requests the mine to upgrade the road to such a state that it will be able to handle the traffic volumes, especially heavy vehicle quantities. Speeding limits and speed bumps should form part of this upgrade, as several farmers own land on both sides of the tar road. Road crossing for both farmers and their livestock occurs daily. Thus, the safety of the farmers and their livestock needs to be assured by the mine. ■ The local farmers request the mine to incorporate dust and noise suppression methods at all times, as heavy dust and noise volumes negatively affect the livelihoods of the surrounding landowners. ■ Safety of the local farming community is regarded as high priority and needs to be addressed by the mine. With the large volume of workers employed by the mine, the farmer community's safety of their families and livestock are compromised. Thus, the farming community requests that a regulated system be implemented at the entrance of the Vaal Eden road, which will regulate and inspect all peoples and equipment entering and exiting this specific road. ■ Since Greenmined Environmental did not receive any comments from the Interested and affected parties, we suggest that the public participation process wasn't adequate and request that a stakeholders' engagement session should be held, informing all of the I&AP's about the project. The local farming community will assist in locating a venue, as well as a specific date for this meeting. 	<p>Please refer to comment above regarding roads.</p> <p>Please refer to comment above regarding dust and noise.</p> <p>No external workers will be employed by the mine.</p> <p>Meeting with the Vaaloewer Ratepayers Association</p>	<p>N/A</p> <p>Refer to the SLP.</p> <p>Refer to Appendix E.</p>
Joy Rabotapi (BEE Partner of Tja Naledi Beafase Investment)	24/10/2017	The only concern is that the DBAR states that the Groundwater is deeper than 5m, and Excavations can be as deep as 10m in some areas. Will there be mitigation measure.	Groundwater will be managed and mitigated as described in Part A – 3(h) iii), (j) and Part A – 3(h) iii) Part B – 1(e)	Part A – 3(h) iii), (j) and Part A – 3(h) iii) Part B – 1(e)

iv) The Environmental attributes associated with the alternatives.

(The environmental attributes 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)

(i) Climate

According to SA Explorer, Parys normally receives about 496mm of rain per year, with most rainfall occurring during summer. The chart below (Figure 3) shows the average rainfall values for Parys per month. It receives the lowest rainfall (0mm) in July and the highest (89mm) in December. The monthly distribution of average daily maximum temperatures (Figure 4) shows that the average midday temperatures for Parys range from 17.2°C in June to 28.2°C in January. The region is the coldest during July when the mercury drops to 0.1°C on average during the night. Consult the chart below (Figure 5) for an indication of the monthly variation of average minimum daily temperatures.

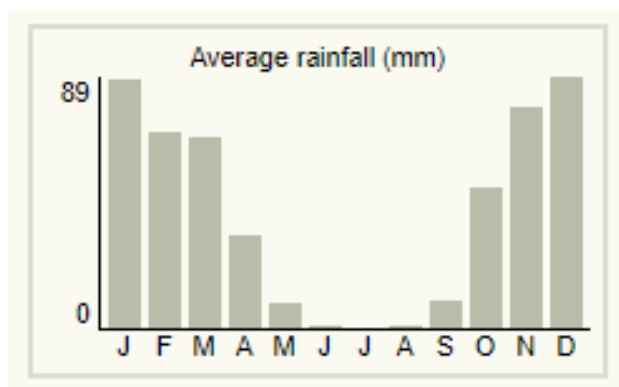


Figure 3: Average rainfall for Parys

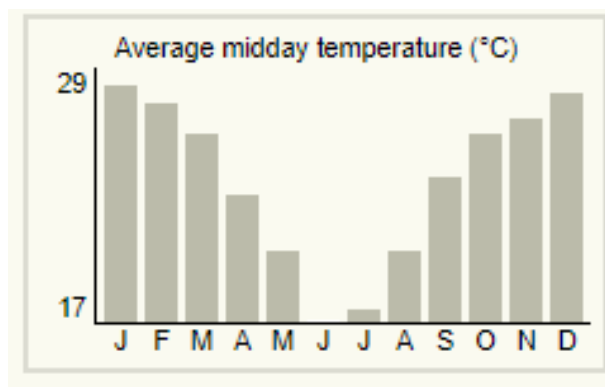


Figure 4: Average midday temperature

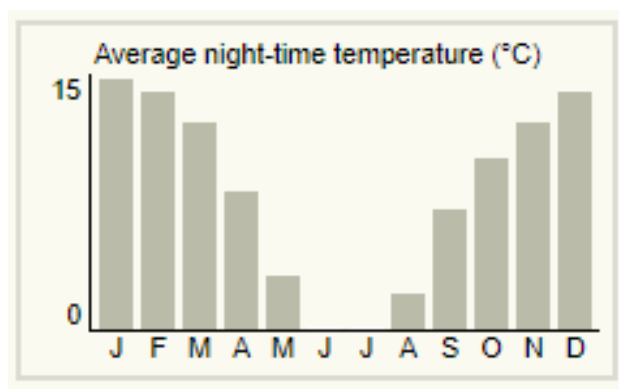


Figure 5: Average night-time temperature

(ii) Geology

The underlying geology comprises quaternary deposits of river gravels and aeolean sand overlying the rocks forming a portion of the ring synclinorium surrounding the Vredefort Dome. On the farm Woodlands the rocks of the ring synclinorium consist of a sequential portion of the Transvaal Sequence from the Malani Dolomite at the bottom to the Black Reef Quartzite not being exposed at Woodlands, up to the Hekpoort Andesite. The sequence as it outcrops on Woodlands has been complicated by a series of east to west trending strike faults that mean that the full sequence is not exposed and that in some cases portions of the sequence are repeated.

The identified mineral deposit is alluvial silica sand deposited by the Paleo-Vaal River over thousands of years. The silica is of a very high quality and is sought after by mainly foundries and tile adhesive manufacturers. This occurrence is not uniform as the sand tends to accumulate in pockets as determined by the topography of the area next to the river. The alluvial silica pockets occur widely on the southern bank of the Vaal River and stretches from below the Vaal dam wall along the river's southern bank for hundreds of kilometres. The deposits are on average 5 meters deep and underlain by floor granites, sandstone, and alluvial gravel and in some instances coal. The silica is extremely pure in the region of 98% and higher with some trace elements of iron.

Farm Geology

The farm Woodlands is situated on the southern banks of the Vaal River in the Free State Province. Most of the farm is situated directly above the paleo-riverbed (the historical path that the Vaal river followed millions of years ago) which is made up of the following elements, namely: A base layer of floor granites typical of the Vredefort dome area, paleo-riverbed gravel varying in size from boulders to pebbles and various layers of high quality silica sand. Being an ancient riverbed the sand layers are deepest in the middle of the paleo-river channel and these levels taper off towards the edges of the said channel. Previous tests done by an accredited test house namely SGS showed that the silica sand is on average 98% pure.

Portions of neighbouring farms were mined in the past by various establishments, including the Provincial Administration of the Free State for road building purposes.

The diverse geology underlying Mesic Highveld Grassland correlates closely with high levels of plant species richness and endemism. The soils derived from the diverse types of parent rock vary in texture from sandy to clayey and the sandier soils tend to support lower basal cover but higher plant species diversity than less sandy ones

(iii) Topography

The local area is characterised by a sloping topography with the Vaal river to the North-East of the property. The area around the proposed mine has the mountains of the Vredefort Dome area to the West.

The average altitude around the proposed site is about 1 500 meters above mean sea level. The removal of Sand and weathered Sand during the mining process will cause slight depressions that would change the natural topography of the area to a small extent.

(iv) Soil, land use and land capability

Pre Mining Land Capability

The agricultural activities in the area are mainly focussed on livestock farming and dry land maize production. The carrying capacity in the area is 4ha per large stock unit (LSU) according to the Department of Agriculture. Although irrigation does occur in the district, the soil conditions at the proposed mining area are not very suitable for irrigation due to the sandy nature of the soil (CC, 2014).

Land Use

The land use in the area is almost exclusively for agricultural purposes. In a study on the declining soil quality in South Africa, Mills and Fey (2003) reported that the effect of erosion in the absence of cultivation is fairly easily explained because the exponential decrease in soil organic matter (SOM) concentration with depth means that relatively little topsoil need be lost to reduce substantially the total SOM content. They concluded that when plants are removed, soil deterioration begins at many fronts: At the surface, soil aggregates are exposed to the force of raindrops, clay disperses, pores become blocked, and runoff, soil loss and soil aridity are intensified. The pedoderm or first few centimetres of undisturbed topsoil holds disproportionately more humus, nutrients and salts than the underlying layers. Therefore, the topsoil will be removed and stored separately and replaced over the disturbed areas during rehabilitation (CC, 2014).

Mesic Highveld Grassland is reasonably well adapted to grazing pressure under low to moderate stocking rates with adequate rest periods (CC, 2014).

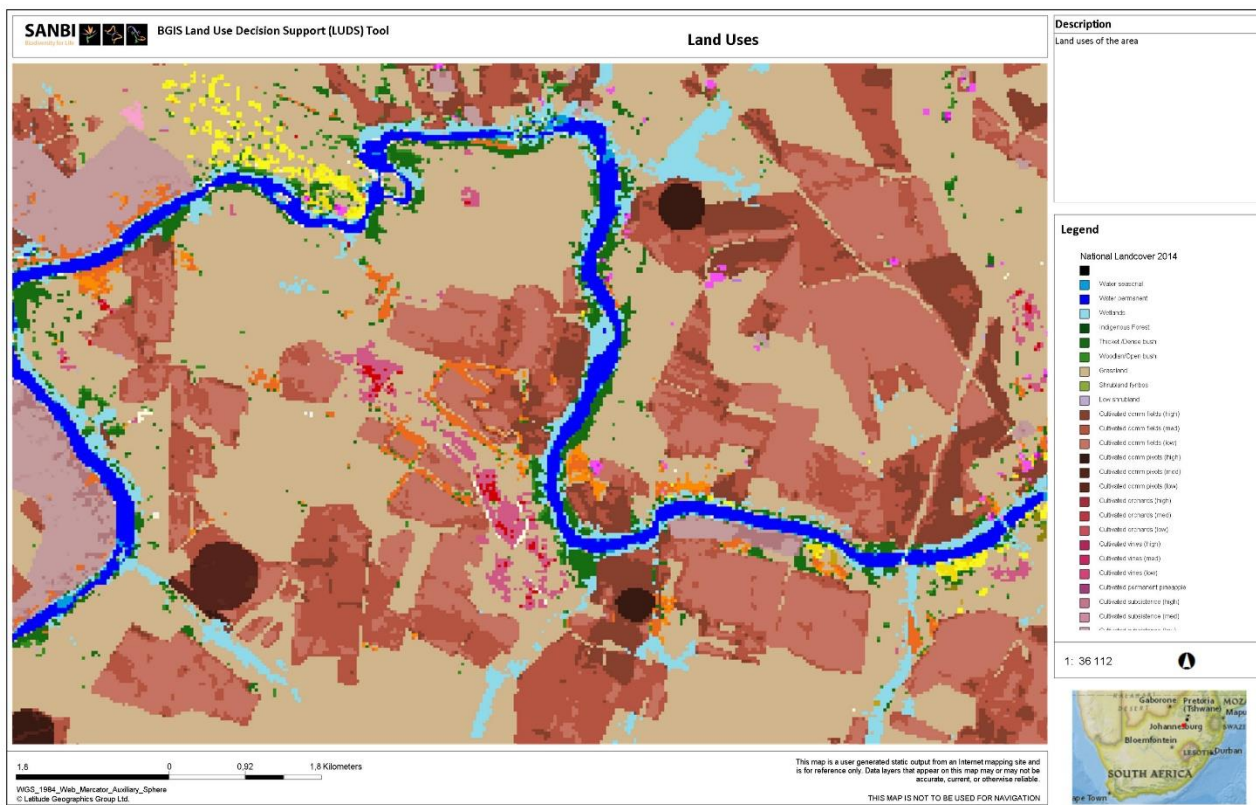


Figure 6: Land Cover of the Proposed Barrage Bulk Sand Mine.

Soil

Soils that are generally deep, fertile and free-draining but can have impervious layers of hardpan or ‘oukclip’ (impervious soil layers, often infused with minerals such as calcium carbonate or iron oxide). The diversity of soil types is influenced by the underlying geology which includes base layers of sedimentary rock (shales, mudstones and sandstones), cut through by dykes and ridges of dolerite, quartzite and gabbro.

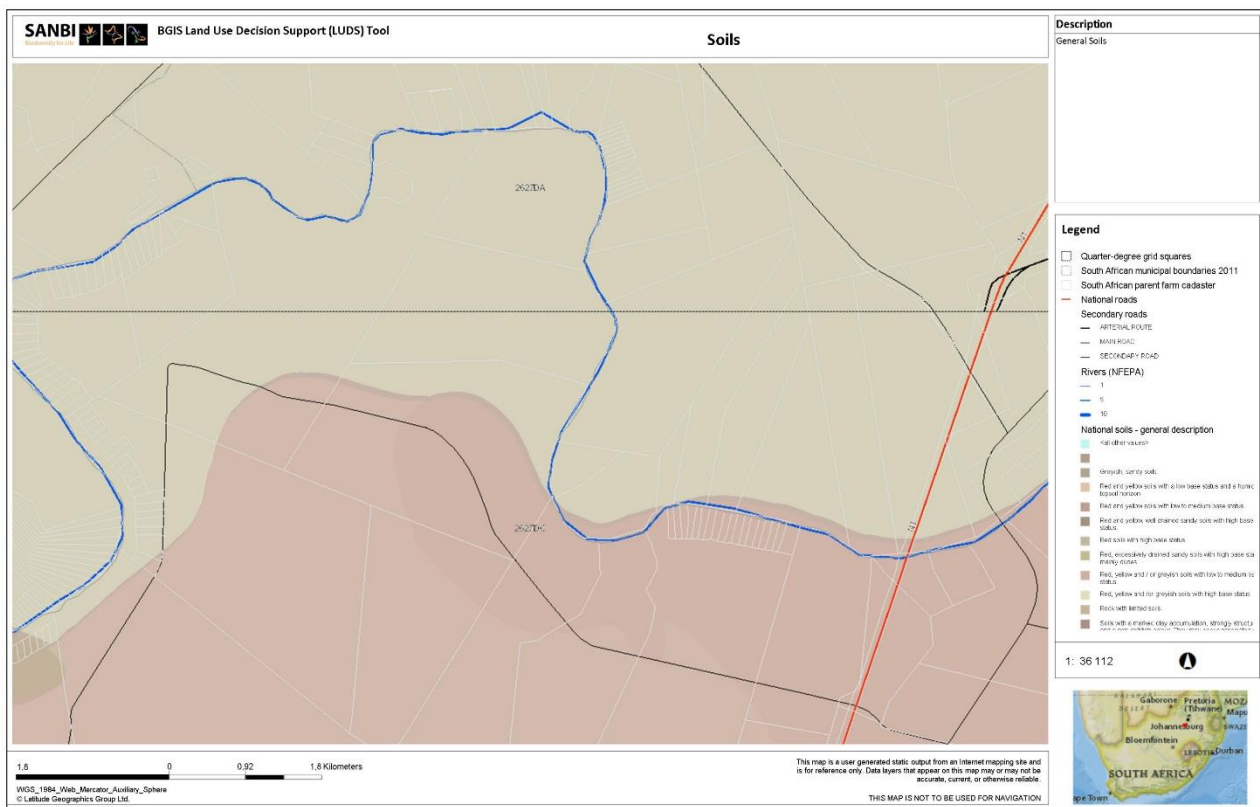


Figure 7: Soil Patterns of the Proposed Barrage Bulk Sand Mine.

(v) Flora

The mine site falls within the northern variation of the Cymbopogon-Themeda Veld (Acocks Veld Type No 48) which is a sparse tufted veld type. Grass species such as *Setaria flabellata*, *Themeda triandra*, *Heteropogon contortus*, *Eragrostis racemosa* and *Cymbopogon plurinodis* are common in this veld type. Trees such as Fire Thorn *Rhus pyroides*, Acacia's *Acacia spp* and Buffalo Thorn *Ziziphus mucronata* can also occur on the site. The site is impacted by the cultivation of grazing and no undisturbed or "virgin" veldt is present on site.

The site falls specifically in the Soweto Highveld Grassland (Mesic Highveld Grassland) (GM 8). It occurs on gently to moderately undulating landscape on the Highveld plateau, supporting short to medium-high, dense, tufted grassland dominated almost entirely by *Themeda triandra*. In places not disturbed, only scattered small wetlands, narrow stream alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover. Only a handful of patches statutorily conserved or privately conserved. Almost half of the area already transformed by cultivation, urban sprawl, mining and building of road infrastructure. Dams have flooded some areas.

Important taxa		
Graminoids		
<i>Andropogon appendiculatus</i> (d), <i>Andropogon schirensis</i> , <i>Aristida adscensionis</i> , <i>A. bipartita</i> ,	<i>Digitaria diagonalis</i> , <i>Diheteropogon amplectens</i> , <i>Eragrostis micrantha</i> , <i>E. superba</i> , <i>Elionurus muticus</i> (d),	<i>Heteropogon contortus</i> (d), <i>Hyparrhenia hirta</i> (d), <i>Harpochloa falx</i> , <i>Microchloa caffra</i> ,

Important taxa		
<i>A. congesta</i> , <i>A. junciformis</i> subsp. <i>galpinii</i> , <i>Brachiaria serrata</i> (d), <i>Cymbopogon</i> <i>pospischillii</i> (d), <i>Cynodon dactylon</i> (d), <i>Cymbopogon caesius</i> ,	<i>Eragrostis capensis</i> (d), <i>E. chloromelas</i> (d), <i>E. curvula</i> (d), <i>E. plana</i> (d), <i>E. planiculmis</i> (d), <i>E. racemosa</i> (d),	<i>Paspalum dilatatum</i> <i>Setaria nigrirostris</i> (d), <i>S. sphacelata</i> (d), <i>Themeda triandra</i> (d), <i>Tristachya leucothrix</i> (d),
Herbs		
<i>Acalypha angustata</i> , <i>Berkheya setifera</i> , <i>Dicoma anomala</i> , <i>Euryops gilfillanii</i> , <i>Geigeria aspera</i> var. <i>aspera</i> , <i>Graderia subintergra</i> ,	<i>Hermannia depressa</i> (d), <i>Haplocarpha scaposa</i> , <i>Helichrysum miconiifolium</i> , <i>H. nudifolium</i> var. <i>nudifolium</i> , <i>H. rugulosum</i> , <i>Hibiscus pusillus</i> ,	<i>Justicia anagalloides</i> , <i>Lippia scaberrima</i> , <i>Rhynchosia effusa</i> , <i>Schistostephium crataegifolium</i> , <i>Selago densiflora</i> , <i>Senecio coronatus</i> , <i>Vernonia oligocephala</i> , <i>Wahlenbergia undulata</i> ;
Geophytic Herbs		
<i>Haemanthus humillis</i> subsp. <i>hirsutus</i> ,	<i>H. montanus</i>	
Herbaceous Climber		
<i>Rhynchosia totta</i>		
Low Shrubs		
<i>Anthospermum hispidulum</i> , <i>A. rigidum</i> subsp. <i>pumilum</i> ,	<i>Berkheya annectens</i> , <i>Felicia muricata</i> ,	<i>Ziziphus zeyheriana</i> .

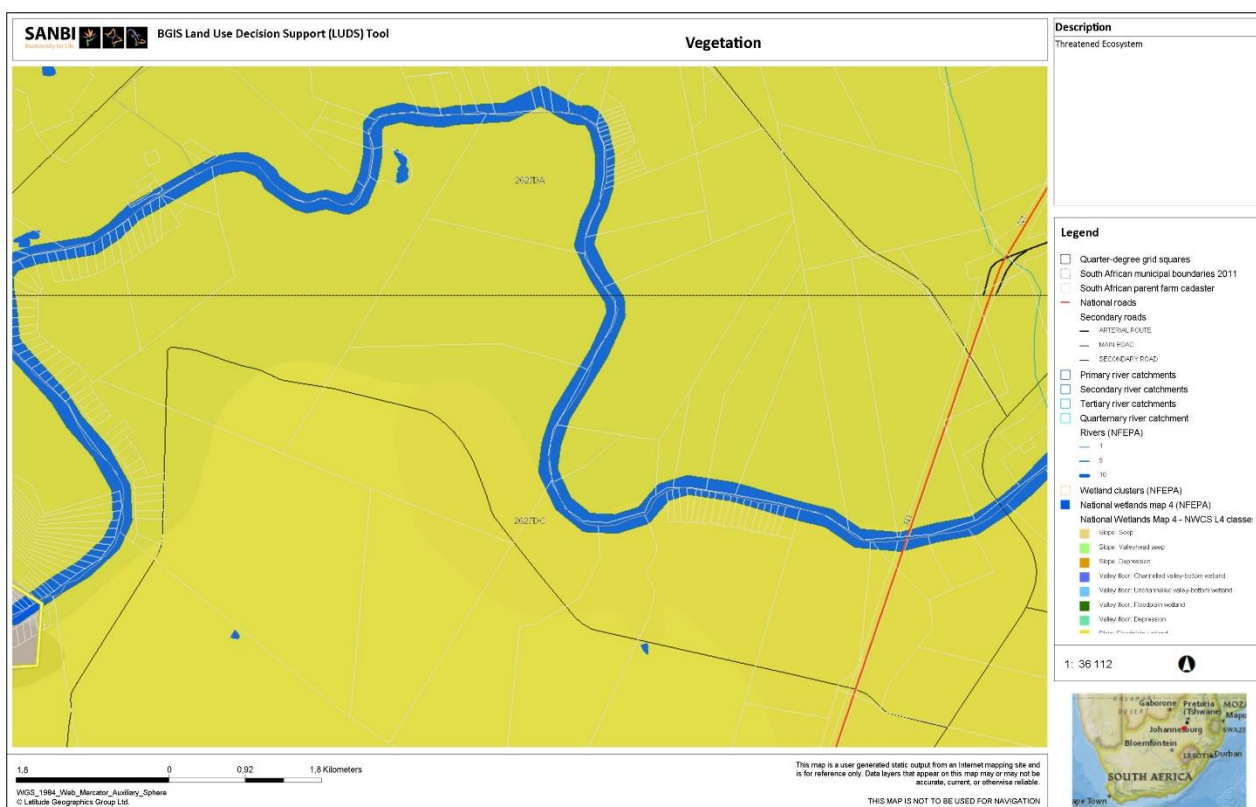


Figure 8: Flora of Tja Naledi - Barrage Bulk Sand Mine

General characteristics of this group of ecosystems are that they:

- Are made up of highly productive sourveld grasslands characterised by long-lived grasses that favour re-sprouting, and other plants that show a tendency to store carbohydrates in specialised underground storage organs; plants withstand above-ground disturbance by being long-lived with only occasional replacement from seed.
- Are adapted to a climate characterised by high summer rainfall (700 – 1 200mm mean annual precipitation), combined with warm summer temperatures and cool to cold winters with a moderate to high incidence of frost.
- Occur at mid-altitudes (1 300 – 1 800m) in varied landscapes that include extensive flat or undulating plains broken by low hills and 'tafelbergs, rocky outcrops, steep boulder-strewn slopes and deep river valleys.
- Occur on soils that are generally deep, fertile and free-draining but can have impervious layers of hardpan or 'oukclip' (impervious soil layers, often infused with minerals such as calcium carbonate or iron oxide). The diversity of soil types is influenced by the underlying geology which includes base layers of sedimentary rock (shales, mudstones and sandstones), cut through by dykes and ridges of dolerite, quartzite and gabbro.
- Conservation:
 - A high proportion of vegetation types in Mesic Highveld Grassland are considered to be threatened and this ecosystem group is generally poorly protected.
- Socio-economic importance:
 - Many key economic activities take place in this grassland ecosystem – mining, grazing, cultivation, plantation forestry and urban settlement; Mesic Highveld grasslands are key water production landscapes – many wetlands and pans and five major river systems have their origin in these grasslands.
 - The climate is characterised by warm, wet summers and cool, dry winters; this, combined with the effects of altitude, results in:
 - A long growing season (centred over summer) lasting about six to seven months, alternating with unproductive winter and early spring seasons.
 - High primary productivity leading to rapid build-up of biomass, resulting in a high fuel load and potentially intense fires.
 - High natural incidence of fire: Summer weather is characterised by frequent storms, and lightning strikes, which cause natural fires. The natural occurrence of fire, combined with the effects of frost and hail storms, maintains the open, largely treeless character of these grasslands (except on rocky ridges, which support natural shrublands because the surface topography favours the growth of woody species over grasses).
- Life-history strategies:
 - The combined summer grazing/winter burning disturbance regime has resulted in vegetation dominated by plants that are perennial and long-lived, and that reproduce mostly by vegetative growth with only occasional replacement from seed.

- There are few annual species found in mesic grassland. This means that these ecosystems do not recover well when areas are cleared, as the newly-disturbed ground is rapidly colonised by other annual weeds that out-compete slower-growing, perennial grasses.
- Hydrological characteristics:
 - Mesic Highveld grasslands are located in high rainfall regions and are vitally important for water production. The characteristically dense vegetation cover traps surface water, slowing runoff and allowing more time for water to drain vertically through the porous soil profile; this water is then stored as sub-surface water by the impermeable rock layers that lie beneath the subsoil. This sub-surface water drains slowly as clean water into the many wetland systems that occur throughout this ecosystem (as a result of its flattish topography), replenishing streams and rivers almost year-round. The supply of good quality water from these ecosystems is important for domestic, agricultural, industrial and commercial water users both in South Africa and neighbouring countries.

(vi) Fauna

Birds commonly associated with the area include the Guinea fowl, plovers, pigeons swaisons's francolin amongst other common airborne species. Ground squirrels, mongoose, moles and rats also occur on the farm. The specific habitat in the area of interest however is not necessarily typical of their presence.

Some of the animals that are currently occurring on the farm might temporarily leave the immediate area of mining for the duration of the mining activities. Proper mitigation measures will ensure the return of the small animals after the mining activities have ceased. No threatened amphibians, reptiles or fish that are listed in the Red Data Book occur on or near the mine site.

The following threatened bird and mammal species may occur in the area:

Common Name	Scientific Name	Red Data Category
Grass Owl	<i>Tyto capensis</i>	Indeterminate
African Finfoot	<i>Podica senegalensis</i>	Indeterminate
Small spotted cat	<i>Felis nigripes</i>	Rare
African striped weasel	<i>Poecilogale albinucha</i>	Rare
South African Hedgehog	<i>Atelerix frontalis</i>	Rare
Antbear	<i>Orycteropus afer</i>	Vulnerable
White-tailed mouse	<i>Mystromys albicaudatus</i>	Vulnerable

(vii) Surface water

The Vaal river forms the North Eastern boundary of the farm. No surface water will be used during the mining process as no washing will take place. The property is situated in the upper catchment of the Vaal river just below the Barrage at Vanderbijlpark.

The proposed mine falls within the Upper Vaal Water Management Area. The Upper Vaal Water Management Area (Upper Vaal WMA) includes the Vaal, Klip, Wilge, Liebenbergsvlei and Mooi Rivers and extends to the confluence of the Mooi and Vaal Rivers. It covers a catchment area of 55 565 km². This WMA includes the very important dams Vaal Dam, Grootdraai Dam and Sterkfontein Dam.

The southern half of the WMA extends over the Free State, the north-east mainly falls within Mpumalanga and the northern and western parts in Gauteng and North West provinces respectively. The Upper Vaal is the uppermost WMA in the Vaal River catchment and one of five WMAs in the Orange River Basin. It is surrounded by the Crocodile (West) and Marico, Olifants, Inkomati, Usutu to Mhlathuze, Thukela, Upper Orange and Middle Vaal WMAs and adjoins Lesotho in the southern extreme. The sub management are being called the Downstream Vaal Dam management area. The mine falls within the quaternary catchment area of C23B.

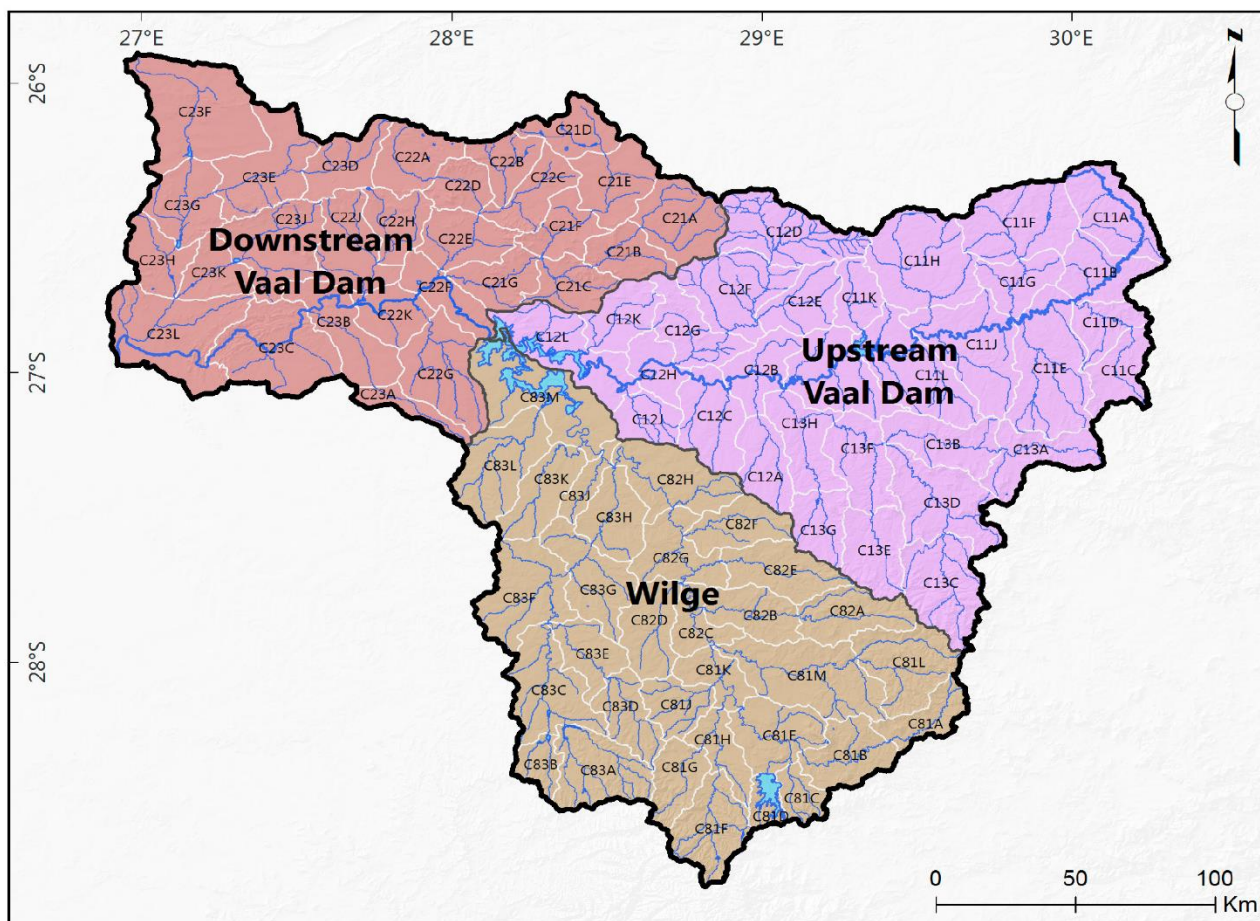


Figure 9: Catchment areas of the Upper Vaal Water Management Area.

No river diversions will be needed. There are no wetlands in the area.

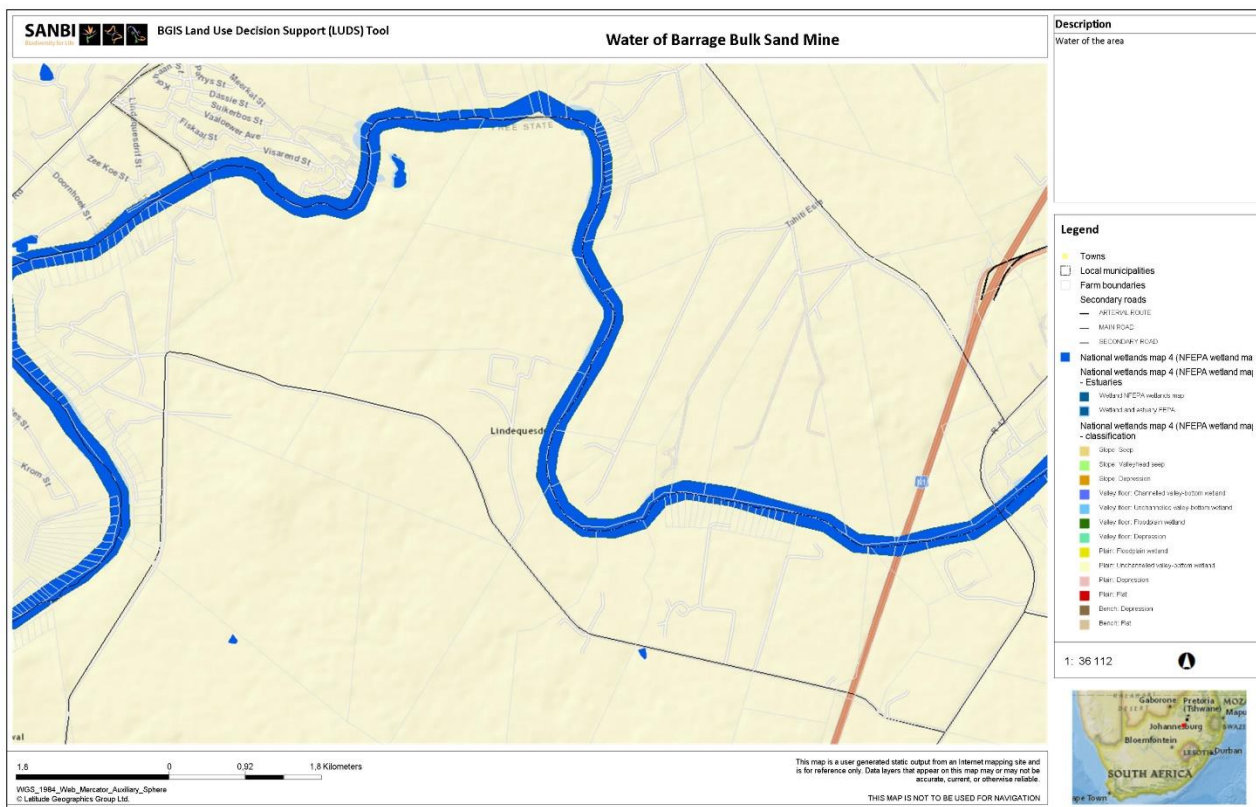


Figure 10: Wetlands in the area.

(viii) Ground water

The mining processes should not have any influence on the quality or quantity of ground water. A negative impact on groundwater usually occurs where subsurface water is pumped out of an excavation pit. This can lower the water table in the immediate surroundings of the excavation, which can negatively impact upon surrounding wetlands (specifically hill slope or seepage wetlands) and boreholes. The proposed method of mining will not entail deep excavations from which groundwater will need to be removed and there are no known wetlands on the farm. The only groundwater that will be used is from an existing farm borehole for domestic water supply and to control dust. This borehole was registered with DWS by the previous owner of the farm. Records of this registration will be sourced and provided as soon as it can be obtained.

Although the depth of the groundwater is unknown it is presumed to be deeper than 5m. Mining at the proposed site is expected to be up to a maximum depth of 10m and therefore the impact on the groundwater will need continuous monitoring should ground water be intersected.

(ix) Air quality

The background air quality of the surrounding area is highly impacted on by vehicles travelling along the Vaal Eden Road, and by the neighbouring sand mines. 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 mine. 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.

The project environment is located within an agricultural setting in which heavy equipment, e.g. tractors, already operate. Noise levels are relatively low in the surrounding properties. Air quality is already impacted negatively by the close proximity of the SASOL chemical plant and Mittal steelworks situated 20km to East North East and East South East of the mine respectively.

(x) Noise

The background noise level of the surrounding area is highly impacted on by traffic travelling along the Vaal Eden road passing the property, as well as the neighbouring sand mines.

Due to the nature of the proposed activity, noise will be generated as a result of mechanical excavation. 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 will only be operational during daylight hours, 6 days a week. The distance of residents from the mining area (>2km) will however assist in the mitigation of the noise impact. 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).

The project environment is located within an agricultural setting in which heavy equipment, e.g. tractors, already operate. Noise levels are relatively low in the surrounding properties. Air quality is already impacted negatively by the close proximity of the SASOL chemical plant and Mittal steelworks situated 20 kilometres to East North East and East South East of the mine respectively.

(xi) Archaeological and cultural interest

Local people that are very familiar with the area and specifically with the farm De Pont were consulted and confirmed that there are no structures, graves or any other item of archaeological or cultural interest according to their knowledge of the farm.

During the field investigation no graves that can potentially be related to sites of archaeological interest were found. Some of the buildings on the farm can have historical significance but mining will not affect these. A specialist study has been commissioned to identify and manage any archaeological or cultural sites if found or identified. A single stone tool was identified but the specialist is of the opinion that it was translocated by river action and not an indication of heritage sites or mounds (Heritage, 2015).

(xii) Visual exposure (Sense of Place)

Due to the current mining disturbance nearby the area the site has a low aesthetic value. The proposed mining area will be visible from Vaal Eden road 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 11: View shed of the proposed Quarry.

From the above figure, the green areas indicated the areas that can see the mine location. The purple areas indicate the areas that cannot be seen by the mine.

(xiii) Regional socio economic structure

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 (200km 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.

Tja Naledi – Barrage Bulk Sand Mine operation is located within Ward 6 of the Ngwanthe Local Municipality.

(a) 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 3: 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
Grade 12 / Std 10	3780	4153	5329	5803	9148	9586
Higher	1699	1698	1763	1877	2202	2440

Source: STATSSA, Census 1996, 2001 and 2011

Table 4: 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 half of the labour force was unemployed. The 2016 household survey does not show the unemployment status and therefore we rely on the 2011 statistics

(b) 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.

(c) 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 5: Population 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

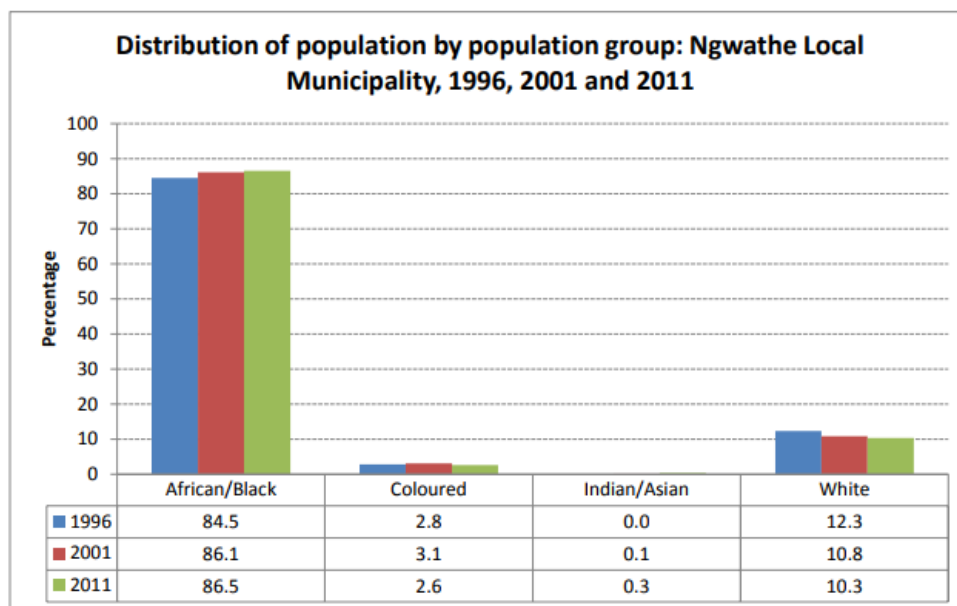
Source: STATSSA, Census 1996, 2001 and 2011

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

Table 6: Statistics for 2016.

Ngwathe Local Municipality	Black african			Coloured			Indian/asian			White			Total		
	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:

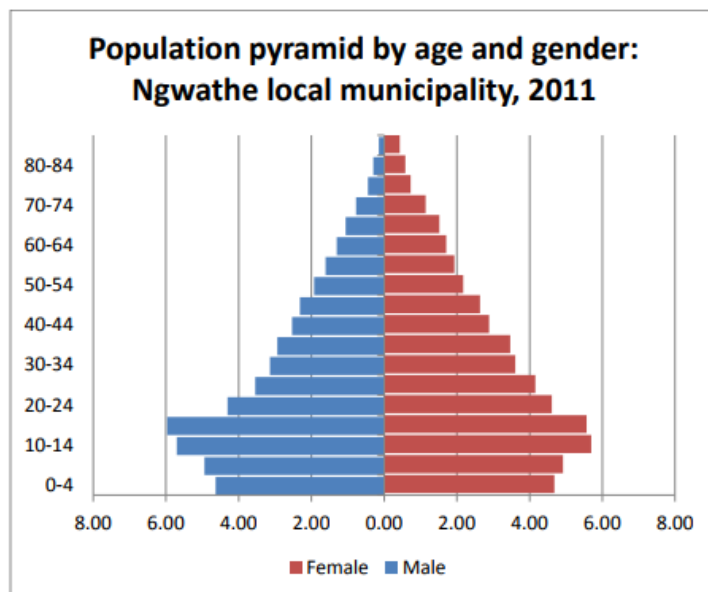


Source: STATSSA, Census 1996, 2001 and 2011

Figure 12: 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 13: 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%.

(d) Housing

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

(e) 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.

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.

(f) 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.

No traditional settlements are present in the area, land use is mostly residential and mixed farming and residential purposes. Population density is fairly low.

There is some existing infrastructure such as two houses, a barn and out buildings on the farm. An Eskom transmission line also crosses the property from North to South. A 40m exclusion zone will be allowed around the buildings and lines as required by the Mine Health and Safety Act. A dirt road and tar road services the farm and surrounding properties. Some of the concerns raised by the interested and affected parties verbally is the deterioration of the tar road due to the increased truck traffic in the area. This is a cumulative impact as there are two other sand mines in the area making use of the same road.

Going forward, together with other sand mines in the area, which will be using the same road (Sweet Sensation and Pure Source Minerals), a strategy will be developed to assist in road repairs once the Section 102 mining right has been approved for Barrage Bulk Sand Mine. The Roads Department is currently busy with an analysis of the road integrity and the sand mines. Once finalized a negotiated plan between BBSM, Pure Source Minerals, Sweet Sensations and the roads department will be discussed and a plan implemented.

The Roads Department informed SPH Kundalila that the Barrage Bridge was built to hold the capacity of the heaviest legal load on national roads, as the bridge is built over a national road. - 120 tons' maximum payload. Vaal-Eden Bridge loads will be investigated.

There are no tourism destinations in the immediate vicinity of the farm. In the larger region there are various tourism destinations within the Vredefort Dome area, but these will not be impacted by the proposed mining project.

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

Tja Naledi Beafase Investment Holdings (Pty) Ltd, currently holds a Mining Right and approved Environmental Management Programme (EMPR) over portion 4 of the farm Woodlands 407 (437.8330ha), which falls in the Ngwanthe Local Municipality in the Fezile Dabi Magisterial district, Free State Province. Tja Naledi – Barrage Bulk Sand Mine, intends to apply for a mining right amendment, to include alluvial diamonds and gravel into the mining right, and to amend the EMP to include processing (screening). Silica Sand and Gravel (aggregate) to be removed from the mine will be used for building material in the vicinity.

The farm Woodlands 407 is situated approximately 3.98km southwest of Vaal Oewer, 22.26km north-east of Parys, 21.6km east of Sasolburg, Free State Province. The area is currently being mined by SPH Kundalila (contractor), under the old mining right (FS30/5/1/2/2/10020MR). The mining method to be used on Barrage Bulk Sand Mine will be strip mining. Mining will take place via a contractor (SPH Kundalila) who will excavate the material, load and haul the material to the processing plant. From the plant the material will be loaded via front end loader directly onto client's trucks. The material will be mined in strips with two strips being open at any given time. The maximum depth of the excavations will be 10m in some areas (building sand and gravel) and 5m in other areas (plaster sand). Aggregate will be screened before loaded onto client's trucks to remove any debris' contained in the aggregate, the aggregate will also be screened to identify any diamonds found in the product. All activities will be contained within the boundaries of the site.

The proposed mining area is approximately 437.8330ha is extent and the applicant, Tja Naledi – Barrage Bulk Sand Mine, intends to win material from the area for at least 10 years. Silica Sand and Gravel (aggregate) to be removed from the mine will be used for building material in the vicinity. Application is also being made for alluvial diamonds, in the case that these minerals will be found during mining. If diamonds where found in the aggregate, these will be separated during the screening process and sold to interested buyers. The proposed mine will therefore contribute to the building industry in and around Parys, Vanderbijlpark and Sasolburg area.

The mining activities will consist out of the following:

- Stripping and stockpiling of topsoil;
- Excavating;
- Crushing;
- Screening;
- 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:

- Excavating Equipment;
- Earthmoving Equipment;
- Mobile Crushing and Screening Plants;
- Temporary Offices;
- Weigh Bridge; and
- Storage Yard for storing of equipment.

A generator will be used to power the infrastructure on site until an Eskom connection can be secured. Water from the two boreholes on site (registered via the farmer) will be used dust suppression and drinking water on site. See the requested map attached as Appendix B.

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 438ha 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 C.

Neighbouring property activities includes the activities below:

- Northern Neighbour – Low density property development in the North West Province and on the banks of the Vaal river;
- North and North west neighbours – sand mine and game farm owned by Goose Bay Developments;
- Southern Neighbour – Mixed farming;
- Eastern Neighbour – Mixed farming by Mr. Lawrence Sher; and
- Vaal Eden- Barrage road runs to in an East-West direction through the property.

v) 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 7: Impact Assessment of Tja Naledi-Barrage Bulk Sand Mine

Nature of Impact	Impact	Positive/Negative / Neutral Impact	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 OFFICE AND ABLUSTION 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
ACTIVITY: STRIPPING AND STOCKPILING OF TOPSOIL												
Geology	Disturbance of geological strata	Neg	Irreversible	1	3	5	3	5	1	3	9	Med
Soils	Potential for loss of soil & damage to soil characteristics	Neg	Reversible	1	3	4	2.7	2	5	3.5	9.333	Med
Soils	Loss of topsoil due to incorrect storm water management		Reversible	1	3	4	2.7	2	5	3.5	9.333	Med
Soils	Soil erosion due to absence of vegetation	Neg	Reversible	1	3	2	2	2	5	3.5	7	Low-Med
Flora	Loss of natural vegetation	Neg	Reversible	1	4	2	2.3	2	5	3.5	8.167	Low-Med
Flora	Infestation of the topsoil heaps by weeds and invader plants.	Neg	Reversible	1	2	2	1.7	2	5	3.5	5.833	Low-Med
Surface Disturbance (Topography)	Alteration of topography	Neg	Irreversible	1	2	5	2.7	2	5	3.5	9.333	Low-Med
Land Use	Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1.7	3	5	4	6.667	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers)	Neg	Reversible	1	2	2	1.7	2	5	3.5	5.833	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	5	5	3.7	1	5	3	11	Med
Noise	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Neg	Reversible	1	1	3	1.7	2	5	3.5	5.833	Low-Med
Air quality	Dust generation	Neg	Reversible	2	2	1	1.7	2	5	3.5	5.833	Low-Med
Fauna	Loss of food, nest sites and refugia	Neg	Reversible	2	1	3	2	1	5	3	6	Low-Med
Fauna	Alienation of animals from the area	Neg	Reversible	2	1	3	2	1	5	3	6	Low-Med
Surface and Ground Water	Contamination of area with hazardous waste materials	Neg	Reversible	1	1	3	1.7	2	5	3.5	5.833	Low-Med
Surface water	Increased risk of siltation of surface water bodies	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
Surface water	Downstream water quantity of catchment reduced	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
Social	Financial gain on different levels	Pos	Reversible	2	1	3	2	4	1	2.5	5	Low-Med



Nature of Impact	Impact	Positive/Negative / Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Groundwater	Quality and Quantity of groundwater could be adversely affected by mining activities	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
ACTIVITY: EXCAVATION												
Soils	Increased potential for road incidences	Neg	Reversible	1	3	4	2.7	2	5	3.5	9.333	Med
Soils	Weed and invader plant infestation of the area	Neg	Reversible	1	3	4	2.7	2	5	3.5	9.333	Med
Soils	Impact on the access roads	Neg	Reversible	1	3	2	2	2	5	3.5	7	Low-Med
Flora	Potential damage to vegetation in neighboring areas	Neg	Reversible	1	4	2	2.3	2	5	3.5	8.167	Low-Med
Surface Disturbance (Topography)	Alteration of topography	Neg	Irreversible	1	2	5	2.7	2	5	3.5	9.333	Low-Med
Land Use	Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1.7	3	5	4	6.667	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers)	Neg	Reversible	1	2	2	1.7	2	5	3.5	5.833	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	5	5	3.7	1	5	3	11	Med
Noise	Negative impact on the fauna and flora of the area	Neg	Reversible	1	1	3	1.7	2	5	3.5	5.833	Low-Med
Air quality	Dust generation	Neg	Reversible	2	2	1	1.7	2	5	3.5	5.833	Low-Med
Fauna	Loss of food, nest sites and refugia	Neg	Reversible	2	1	3	2	1	5	3	6	Low-Med
Fauna	Alienation of animals from the area	Neg	Reversible	2	1	3	2	1	5	3	6	Low-Med
Surface and Ground Water	Cultural and Heritage Artefacts	Neg	Reversible	1	1	3	1.7	2	5	3.5	5.833	Low-Med
Surface water	Increased risk of siltation of surface water bodies	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
Surface water	Downstream water quantity of catchment reduced	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
Groundwater	Quality and Quantity of groundwater could be adversely affected by mining activities	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
ACTIVITY: TRANSPORTATION OF SAND AND AGGREGATES FROM STOCKPILE AREA TO CLIENTS												
Soils	Potential for loss of soil & damage to soil characteristics	Neg	Reversible	1	3	4	2.7	2	5	3.5	9.333	Med
Soils	Contamination of area with hazardous waste materials	Neg	Reversible	1	3	4	2.7	2	5	3.5	9.333	Med
Flora	Loss of biodiversity	Neg	Reversible	1	4	2	2.3	2	5	3.5	8.167	Low-Med
Flora	Potential damage to vegetation in neighboring areas	Neg	Reversible	1	2	2	1.7	2	5	3.5	5.833	Low-Med
Surface Disturbance (Topography)	Alteration of topography	Neg	Irreversible	1	2	5	2.7	2	5	3.5	9.333	Low-Med
Land Use	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 Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers)	Neg	Reversible	1	2	2	1.7	2	5	3.5	5.833	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	5	5	3.7	1	5	3	11	Med
Noise	Noise nuisance caused by vehicles	Neg	Reversible	1	1	3	1.7	2	5	3.5	5.833	Low-Med
Air quality	Dust generation	Neg	Reversible	2	2	1	1.7	2	5	3.5	5.833	Low-Med
Fauna	Loss of food, nest sites and refugia	Neg	Reversible	2	1	3	2	1	5	3	6	Low-Med
Fauna	Alienation of animals from the area	Neg	Reversible	2	1	3	2	1	5	3	6	Low-Med
Surface and Ground Water	Contamination of area with hazardous waste materials	Neg	Reversible	1	1	3	1.7	2	5	3.5	5.833	Low-Med
Surface water	Increased risk of siltation of surface water bodies	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
Surface water	Downstream water quantity of catchment reduced	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
Groundwater	Quality and Quantity of groundwater could be adversely affected by mining activities	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
ACTIVITY: SCREENING OF SAND AND AGGREGATES												
Noise	Increased noise levels	Neg	Reversible	1	3	4	2.7	2	5	3.5	9.333	Med
Surface Disturbance (Topography)	Alteration of topography	Neg	Irreversible	1	2	5	2.7	2	5	3.5	9.333	Low-Med
Land Use	Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1.7	3	5	4	6.667	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers)	Neg	Reversible	1	2	2	1.7	2	5	3.5	5.833	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	5	5	3.7	1	5	3	11	Med
Air quality	Dust generation	Neg	Reversible	2	2	1	1.7	2	5	3.5	5.833	Low-Med
Fauna	Loss of food, nest sites and refugia	Neg	Reversible	2	1	3	2	1	5	3	6	Low-Med
Fauna	Alienation of animals from the area	Neg	Reversible	2	1	3	2	1	5	3	6	Low-Med
Surface and Ground Water	Increased risk of siltation of surface water bodies	Neg	Reversible	1	1	3	1.7	2	5	3.5	5.833	Low-Med
Surface water	Increased risk of siltation of surface water bodies	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
Surface water	Downstream water quantity of catchment reduced	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
Groundwater	Quality and Quantity of groundwater could be adversely affected by mining activities	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med



Nature of Impact	Impact	Positive/Negative / Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
ACTIVITY: SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTRUBED AREA (FINAL REHBAILITATION)												
Soils	Erosion of returned topsoil after rehabilitation	Neg	Reversible	1	3	4	2.7	2	5	3.5	9.333	Med
Soils	Loss of reinstated topsoil due to the absence of vegetation	Neg	Reversible	1	3	4	2.7	2	5	3.5	9.333	Med
Flora	Weeds and invader plant infestation of the area	Neg	Reversible	1	4	2	2.3	2	5	3.5	8.167	Low-Med
Surface Disturbance (Topography)	Alteration of topography	Neg	Irreversible	1	2	5	2.7	2	5	3.5	9.333	Low-Med
Land Use	Degrading of grazing potential for livestock farming	Neg	Reversible	1	2	2	1.7	3	5	4	6.667	Low-Med
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers)	Neg	Reversible	1	2	2	1.7	2	5	3.5	5.833	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	5	5	3.7	1	5	3	11	Med
Noise	Noise nuisance caused by machinery	Neg	Reversible	1	1	3	1.7	2	5	3.5	5.833	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
Fauna	Loss of food, nest sites and refugia	Neg	Reversible	2	1	3	2	1	5	3	6	Low-Med
Fauna	Alienation of animals from the area	Neg	Reversible	2	1	3	2	1	5	3	6	Low-Med
Safety	Health and safety risk posed by un-sloped areas	Neg	Reversible	2	1	3	2	1	5	3	6	Low-Med
Surface water	Increased risk of siltation of surface water bodies	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
Surface water	Downstream water quantity of catchment reduced	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med
Groundwater	Quality and Quantity of groundwater could be adversely affected by mining activities	Neg	Reversible	2	1	2	1.7	2	5	3.5	5.833	Low-Med

(1) Cumulative Impacts

Table 8: Cumulative Impact Assessment of Tja Naledi-Barrage Bulk Sand Mine

Nature of Impact	Impact	Positive/Negative/Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating	Mitigation
CONSTRUCTION AND OPERATIONAL PHASES													
ACTIVITY: Utilization of haul and access roads within the mining right area													
SUB ACTIVITY: Truck and heavy machinery operations													
Traffic & Safety	Increased potential for road incidences	Neg	Reversible	2	3	1	2	3	1	2	4	Low	All intersections with main tarred roads will be clearly signposted. Drivers will be enforced to keep to set speed limits. Trucks will be in road-worthy condition with reflective strips.
Traffic & Safety	Road degradation	Neg	Reversible	1	3	1	1.666667	2	1	1.5	2.5	Low	A fund will be set aside (with the two similar mines in close vicinity of the Tja Naledi) to maintain the serviceability of the road verge where the trucks approach or depart from the main road.

vi) 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.)

A “significant impact” is defined as it is defined in the EIA Regulations (2014): “an impact that may have a notable effect on one or more aspects of the environment or may result non-compliance with accepted environmental quality standards, thresholds or targets and is determined through rating the positive and negative effects of an impact on the environment based on criteria such as by its duration, magnitude, intensity or probability of occurrence”. The objective of this EIA methodology is to serve as framework for accurately evaluating impacts associated with current or proposed activities in the biophysical, social and socio-economical spheres. It aims to ensure that all legal requirements and environmental considerations are met in order to have a complete and integrated environmental framework for impact evaluations.

The process of determining impacts to be assessed is one of the most important parts of the environmental impact assessment process. It is of such high importance because the environmental impacts identified can and are often linked to the same impact stream.

In this method all impacts on the biophysical environment are assessed in terms of the overall integrity of ecosystems, habitats, populations and individuals affected. The Environmental Impact Assessment (EIA) 2014 Regulations promulgated in terms of Sections 24 (5), 24M and 44 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998) [as amended] requires that all identified potential impacts associated with the proposed project be assessed in terms of their overall potential significance on the natural, social and economic environments.

The criteria identified in the EIA Regulations (2014) include the following:

- Nature of the impact;
- Extent of the impact;
- Duration of the impact;
- Frequency of the Impact;
- Probability of the impact occurring;
- Degree to which impact can be reversed;
- Degree to which impact may cause irreplaceable loss of resources;
- Degree to which the impact can be mitigated; and
- Cumulative impacts.

Greenmined Environmental has developed an impact assessment methodology (as defined below) whereby the significance of a potential impact is determined through the assessment of the relevant temporal and spatial scales determined of the extent, magnitude and duration criteria associated with a particular impact. This method does not explicitly define each of the criteria but rather combines them and results in an indication of the overall significance.

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 judgement;
- 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).

(1) Methodology that will be used

(a) Nature of the impact

The nature of an impact can be defined as “a brief description of the impact being assessed, in terms of the proposed activity or project, including the socio-economic or environmental aspect affected by this impact”.

(b) Extent of the impact

The extent of an impact can be defined as “a brief description of the spatial influence of the impact or the area that will be affected by the impact”.

Table 9: Determining the extent of an impact

EXTENT Extent or spatial influence of impact	Footprint	Only as far as the activity, such as footprint occurring within the total site area
	Site	Only the site and / or 500m radius from the site will be affected
	Local	Local area / district (neighbouring properties, transport routes and adjacent towns) is affected
	Region	Entire region / province is affected
	National	Country is affected

(c) Severity of the impact

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 10: 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

(d) Duration of the impact

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.

Table 11: Rating of Duration



Rating		Description
1	Very Short Term	Up to three months (quarter) after construction
2	Short Term	Three months to one year after construction
3	Medium Term	One year to six years after construction
4	Long Term	Six to ten years after construction
5	Permanent	Beyond ten years after construction

(e) Probability of the impact occurring

The probability of an impact can be defined as “the estimated chance of the impact happening”. Probability refers to how often the activity or aspect has an impact on the environment.

Table 12: Determining the probability of an impact

PROBABILITY	1	Almost never / almost impossible	<i>Impossible</i> to occur (0 – 20% probability of occurring)
	2	Very seldom / highly unlikely	<i>Unlikely</i> to occur (20 -40% probability of occurring)
	3	Infrequent / unlikely / seldom	<i>May occur</i> (40-60% chance of occurring)
	4	Often / regularly / likely / possible	<i>Likely</i> to occur (60-80% chance of occurring)
	5	Daily / highly likely / definitely	Will <i>certainly</i> occur (80-100% chance of occurring)

(f) Degree to which impact can be reversed

The reversibility of an impact can be defined as “the ability of an impact to be changed from a state of affecting aspects to a state of not affecting aspects”.

Table 13: Determining the reversibility of an impact

REVERSIBILITY	Reversible	Impacts can be reversed through the implementation of mitigation measures
	Irreversible	Impacts are permanent and can't be reversed by the implementation of mitigation measures

(g) Determination of Likelihood:

The irreplaceability (likelihood) of an impact can be defined as “the amount of resources that can / can't be replaced”. 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 Table 12 and Table 14.

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

Determination of Frequency

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

Table 14: 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

(h) Determination of Overall Environmental Significance:

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

Environmental Significance = Overall Consequence X Overall Likelihood

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.

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

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 or 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.

(i) 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 above.

(j) Degree to which the impact can be mitigated

The degree to which an impact can be mitigated can be defined as “the effect of mitigation measures on the impact and its degree of effectiveness”.

Table 15: Determining the mitigation rating of an impact

MITIGATION RATING	MITIGATED Degree impact can be mitigated	High	<i>Impact 100% mitigated</i>
		Medium	<i>Impact >50% mitigated</i>
		Low	<i>Impact <50% mitigated</i>

(k) Cumulative Impacts

The effect of cumulative impacts can be described as “the effect the combination of past, present and “reasonably foreseeable” future actions have on aspects”.

Table 16: Determining the confidence rating of an impact

CUMULATIVE RATING	CUMULATIVE	Low	<i>Minor cumulative effects</i>
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	EFFECTS	Medium	<i>Moderate</i> cumulative effects
		High	<i>Significant</i> cumulative effects

vii) 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)

No other alternative sites needed to be investigated as this is an amendment of the current EMPR.

The site was identified during the assessment phase of the environmental impact assessment (2014 assessment), by the applicant and project team, and was therefore selected as the **preferred alternative** due to the following:

Positive Impacts:

- 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 within neighbouring sand mines, and will minimally affect the community with regards to dust and noise;
- The mineral to be mined is already in sand form and will not need to be blasted in order to loosen the material;
- The mining area can be reached by an existing farm access road that connects to Vaal Eden-Barrage road. 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 (Parys). 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;
- Road integrity and bridge integrity might be affected if no upkeep is in place; and
- Negative impacts with regard to the environment include potential contamination of the area due to spillage of hydrocarbon products.

The land is currently under cultivated grazing, mixed farming and mining. Two farm houses, a barn and outbuildings are currently present on site. These buildings will not be impacted by mining and are situated in the exclusion zones on the mining plan.

viii) 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 mitigation 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)

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.
- All roads will be sprayed with water or an environmental friendly dust-allaying agent that contained PCB's (e.g. DAS products/ Pro/base) at regular intervals to ensure that dust is adequately suppressed in the mining of roads.
- All disturbed or exposed areas will be re-vegetated as soon as possible during the mining to prevent any dust source from being created.
- A fall out and nuisance dust monitoring programme could be submitted to the principle inspector of mines (DMR-Welkom) on an annual basis if required. If any complaint is received form the public or state department regarding dust levels, the fall-out and nuisance dust levels will again be monitored at prescribed monitoring points. The result will then be compiled into monthly reports and forwarded to the Director-Occupational Hygiene.
- Fallout dust will be monitored via a fallout dust bucket system on the boundaries of the mining area.

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.

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.
- Noise monitoring station will be set up at Craig Richardson farm to measure the levels of noise from Tja Naledi. Personal dust and noise monitoring is being conducted, which forms part of the Mine Health and Safety Act.
- SPH have appointed an occupation hygienist as per the OHS to conduct the gravimetric noise testing done. This concern will be investigated further to minimise noise in the mining area.

Road and Bridge Integrity

- Going forward, together with other sand mines in the area, which will be using the same road (Sweet Sensation and Pure Source Minerals), a strategy will be developed to assist in road repairs once the Section 102 mining right has been approved for Barrage Bulk Sand Mine.
- Roads Department is currently busy with an analysis of the road integrity and the sand mines. Once finalized a negotiated plan between BBSM, Pure Source Minerals, Sweet Sensations and the roads department will be discussed and a plan implemented.
- The Roads Department informed SPH Kundalila that the Barrage Bridge was built to hold the capacity of the heaviest legal load on national roads, as the bridge is built over a national road. - 120 tons' maximum payload.
- Vaal-Eden Bridge loads will be investigated.

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.

ix) Motivation where no alternative sites were considered.

Tja Naledi – Barrage Bulk Sand Mine identified the need for sand and aggregate in the area due to an increase in building, construction and road maintenance projects. As mentioned earlier, no other alternative sites needed to be investigated as this is an amendment of the current EMPR. The site was identified during the assessment phase of the environmental impact assessment (2014 assessment), by the applicant and project team, and was therefore selected as the preferred alternative.

Not applicable as this BAR/EMP is an amendment of the previous approved EMP.

x) Statement motivating the alternative development location within the overall site.

(Provide a statement motivating the final site layout that is proposed)

Tja Naledi – Barrage Bulk Sand Mine identified the need for sand and aggregate in the area due to an increase in building, construction and road maintenance projects. As mentioned earlier, no other alternative sites needed to be investigated as this is an amendment of the current EMPR. The site was identified during the assessment phase of the environmental impact assessment (2014 assessment), by the applicant and project team, and was therefore selected as the preferred alternative.

No statement needed as no alternatives are discussed and therefore not applicable,

i) 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 mining 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 17: Impact Assessment of Tja Naledi-Barrage Bulk Sand Mine

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		None.									Low
ACTIVITY: ESTABLISHMENT OF TEMPORARY OFFICE AND ABLUSTION 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
ACTIVITY: STRIPPING AND STOCKPILING OF TOPSOIL													
Geology	Disturbance of geological strata	Neg	Irreversible	None.	1	3	5	3	5	1	3	9	Low-Med
Soils	Potential for loss of soil & damage to soil characteristics	Neg	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
Soils	Loss of topsoil due to incorrect storm water management		Reversible	Loss of topsoil due to incorrect storm water management <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> 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	1	2	3	2.5	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
Soils	Soil erosion due to absence of vegetation	Neg	Reversible	The necessary measures will be put in place to limit erosion from the stockpiles and to divert storm water away from the stockpiles. Re-vegetate any bare soil immediately. Herbaceous plant matter should be stockpiled to retain organic content of soil. Stockpiles should be to the specifications of the pedological study.	1	3	2	2	2	3	2.5	5	Low-Med
Flora	Loss of natural vegetation	Neg	Reversible	topsoil will be removed before mining operations commence. restoring of topsoil during rehabilitation would encourage natural re-vegetation of the area. re-vegetation with indigenous seeds would be done if it is necessary. 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.	1	4	2	2.3	2	3	2.5	5.833	Low-Med
Flora	Infestation of the topsoil heaps by weeds and invader plants.	Neg	Reversible	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	2	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
Surface Disturbance (Topography)	Alteration of topography	Neg	Irreversible	Excavation areas will be sloped during rehabilitation to even out depressions.	1	2	5	2.7	2	3	2.5	6.667	Low-Med
Land Use	Degrading of grazing potential for livestock farming	Neg	Reversible	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
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers)	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA.	1	2	2	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.	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.	1	5	5	3.7	1	3	2	7.333	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.	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 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. • 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.	2	2	1	1.7	2	3	2.5	4.167	Low
Fauna	Loss of food, nest sites and refugia	Neg	Reversible	Relocate larger animals with the aid of specialists. Ensure relevant permits are in place.	2	1	3	2	1	3	2	4	Low
Fauna	Alienation of animals from the area	Neg	Reversible	Mining will only take place on designated areas, and will be restricted to office hours. No traps or hunting of any animals will be allowed. Mining will be done with the least possible habitat destruction. mining activities are only temporary. Inform staff, contractors and visitors to not harm fauna in the area.	2	1	3	2	1	3	2	4	Low

Nature of Impact	Impact	Positive/Negative/Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Surface and Ground Water	Contamination of area with 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 liter 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	1	3	1.7	2	3	2.5	4.167	Low
Surface water	Increased risk of siltation of surface water bodies	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place.	2	1	2	1.7	2	3	2.5	4.167	Low
Surface water	Downstream water quantity of catchment reduced	Neg	Reversible		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
Social	Financial gain on different levels	Pos	Reversible	The SLP was submitted as part of the application manages this aspect of the project.	2	1	3	2	4	1	2.5	5	Low-Med
Groundwater	Quality and Quantity of groundwater could be adversely affected by mining activities	Neg	Reversible	Groundwater will only be used for domestic purposes and will not be directly affected by mining activities.	2	1	2	1.7	2	3	2.5	4.167	Low
ACTIVITY: EXCAVATION													
Soils	Increased potential for road incidences	Neg	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
Soils	Weed and invader plant infestation of the area	Neg	Reversible	<p>Management of weed- or invader plants:</p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> 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	3	1	2	3	2.5	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
Soils	Impact on the access roads	Neg	Reversible	The necessary measures will be put in place to limit erosion from the stockpiles and to divert storm water away from the stockpiles. Re-vegetate any bare soil immediately. Herbaceous plant mater should be stockpiled to retain organic content of soil. Stockpiles should be to the specifications of the pedological study.	1	3	2	2	2	3	2.5	5	Low-Med
Flora	Potential damage to vegetation in neighboring areas	Neg	Reversible	Limit activity to area of disturbance and revegetated impacted areas as soon as possible.	1	4	2	2.3	2	3	2.5	5.833	Low-Med
Surface Disturbance (Topography)	Alteration of topography	Neg	Irreversible	Excavation areas will be sloped during rehabilitation to even out depressions.	1	2	5	2.7	2	3	2.5	6.667	Low-Med
Land Use	Degrading of grazing potential for livestock farming	Neg	Reversible	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
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers)	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA.	1	2	2	1.7	2	3	2.5	4.167	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	The visual impact may affect the aesthetics of the landscape.	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.	1	5	5	3.7	1	3	2	7.333	Low-Med
Noise	Negative impact on the fauna and flora of the area	Neg	Reversible	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.	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 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
Fauna	Loss of food, nest sites and refugia	Neg	Reversible	Relocate larger animals with the aid of specialists. Ensure relevant permits are in place.	2	1	3	2	1	3	2	4	Low
Fauna	Alienation of animals from the area	Neg	Reversible	Mining will only take place on designated areas, and will be restricted to office hours. No traps or hunting of any animals will be allowed. Mining will be done with the least possible habitat destruction. mining activities are only temporary. Inform staff, contractors and visitors to not harm fauna in the area.	2	1	3	2	1	3	2	4	Low
Surface and Ground Water	Cultural and Heritage Artefacts	Neg	Reversible	Contamination may cause surface or ground water pollution if not addressed	1	1	3	1.7	2	3	2.5	4.167	Low
Surface water	Increased risk of siltation of surface water bodies	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place.	2	1	2	1.7	2	3	2.5	4.167	Low
Surface water	Downstream water quantity of catchment reduced	Neg	Reversible	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.	2	1	2	1.7	2	3	2.5	4.167	Low
Groundwater	Quality and Quantity of groundwater could be adversely affected by mining activities	Neg	Reversible	Groundwater will only be used for domestic purposes and will not be directly affected by mining activities.	2	1	2	1.7	2	3	2.5	4.167	Low
ACTIVITY: TRANSPORTATION OF SAND AND AGGREGATES FROM STOCKPILE AREA TO CLIENTS													
Soils	Potential for loss of soil & damage to soil characteristics	Neg	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
Soils	Contamination of area with hazardous waste materials		Reversible	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.	1	3	1	2	3	2.5	2.5	5	Low-Med
Flora	Loss of biodiversity	Neg	Reversible	topsoil will be removed before mining operations commence. restoring of topsoil during rehabilitation would encourage natural re-vegetation of the area. re-vegetation with indigenous seeds would be done if it is necessary. 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.	1	4	2	2.3	2	3	2.5	5.833	Low-Med
Flora	Potential damage to vegetation in neighboring areas	Neg	Reversible	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.	1	2	2	1.7	2	3	2.5	4.167	Low
Surface Disturbance (Topography)	Alteration of topography	Neg	Irreversible	Excavation areas will be sloped during rehabilitation to even out depressions.	1	2	5	2.7	2	3	2.5	6.667	Low-Med
Land Use	Degrading of grazing potential for livestock farming	Neg	Reversible	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
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers)	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA.	1	2	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
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	Management of weed- or invader plants: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> 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. 	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.	1	5	5	3.7	1	3	2	7.333	Low-Med
Noise	Noise nuisance caused by vehicles	Neg	Reversible	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.	1	1	3	1.7	2	3	2.5	4.167	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
Fauna	Loss of food, nest sites and refugia	Neg	Reversible	Relocate larger animals with the aid of specialists. Ensure relevant permits are in place.	2	1	3	2	1	3	2	4	Low

Nature of Impact	Impact	Positive/Negative/Neutral Impact	Reversibility	Mitigation	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating
Fauna	Alienation of animals from the area	Neg	Reversible	Mining will only take place on designated areas, and will be restricted to office hours. No traps or hunting of any animals will be allowed. Mining will be done with the least possible habitat destruction. mining activities are only temporary. Inform staff, contractors and visitors to not harm fauna in the area.	2	1	3	2	1	3	2	4	Low
Surface and Ground Water	Contamination of area with hazardous waste materials	Neg	Reversible	Contamination may cause surface or ground water pollution if not addressed	1	1	3	1.7	2	3	2.5	4.167	Low
Surface water	Increased risk of siltation of surface water bodies	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place.	2	1	2	1.7	2	3	2.5	4.167	Low
Surface water	Downstream water quantity of catchment reduced	Neg	Reversible	Ensure water management facilities are operating adequately. Clean out silt build up over dry season.	2	1	2	1.7	2	3	2.5	4.167	Low
Groundwater	Quality and Quantity of groundwater could be adversely affected by mining activities	Neg	Reversible	Groundwater will only be used for domestic purposes and will not be directly affected by mining activities.	2	1	2	1.7	2	3	2.5	4.167	Low
ACTIVITY: SCREENING OF SAND AND AGGREGATES													
Noise	Increased noise levels	Neg	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
Surface Disturbance (Topography)	Alteration of topography	Neg	Irreversible	Excavation areas will be sloped during rehabilitation to even out depressions.	1	2	5	2.7	2	3	2.5	6.667	Low-Med
Land Use	Degrading of grazing potential for livestock farming	Neg	Reversible	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 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
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers)	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA.	1	2	2	1.7	2	3	2.5	4.167	Low
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	The visual impact may affect the aesthetics of the landscape.	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.	1	5	5	3.7	1	3	2	7.333	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
Fauna	Loss of food, nest sites and refugia	Neg	Reversible	Relocate larger animals with the aid of specialists. Ensure relevant permits are in place.	2	1	3	2	1	3	2	4	Low
Fauna	Alienation of animals from the area	Neg	Reversible	Mining will only take place on designated areas, and will be restricted to office hours. No traps or hunting of any animals will be allowed. Mining will be done with the least possible habitat destruction. mining activities are only temporary. Inform staff, contractors and visitors to not harm fauna in the area.	2	1	3	2	1	3	2	4	Low
Surface and Ground Water	Increased risk of siltation of surface water bodies	Neg	Reversible	Ensure water management facilities are operating adequately. Ensure integrity of any lining is not compromised. Ensure no standing water on site and that all dirty water within the footprint drains into lined PCDs.	1	1	3	1.7	2	3	2.5	4.167	Low
Surface water	Increased risk of siltation of surface water bodies	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place.	2	1	2	1.7	2	3	2.5	4.167	Low
Surface water	Downstream water quantity of catchment reduced	Neg	Reversible	-	2	1	2	1.7	2	3	2.5	4.167	Low
Groundwater	Quality and Quantity of groundwater could be adversely affected by	Neg	Reversible	Groundwater will only be used for domestic purposes and will not be directly affected by mining activities.	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
	mining activities												
ACTIVITY: SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)													
Soils	Erosion of returned topsoil after rehabilitation	Neg	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
Soils	Loss of reinstated topsoil due to the absence of vegetation		Reversible	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	1	3	1	2	3	2.5	2.5	5	Low-Med
Flora	Weeds and invader plant infestation of the area	Neg	Reversible	topsoil will be removed before mining operations commence. restoring of topsoil during rehabilitation would encourage natural re-vegetation of the area. re-vegetation with indigenous seeds would be done if it is necessary. 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.	1	4	2	2.3	2	3	2.5	5.833	Low-Med
Surface Disturbance (Topography)	Alteration of topography	Neg	Irreversible	Excavation areas will be sloped during rehabilitation to even out depressions.	1	2	5	2.7	2	3	2.5	6.667	Low-Med
Land Use	Degrading of grazing potential for livestock farming	Neg	Reversible	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
Land Use	Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighboring farmers)	Neg	Reversible	Precautionary measures such as fire breaks would be taken into account and the company will join the local FPA.	1	2	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
Visual aspect	Deterioration in visual aesthetics of the area	Neg	Reversible	The visual impact may affect the aesthetics of the landscape.	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.	1	5	5	3.7	1	3	2	7.333	Low-Med
Noise	Noise nuisance caused by machinery	Neg	Reversible	The noise impact should be contained within the boundaries of the property, and will represent the current noise levels of the farm.	1	1	3	1.7	2	3	2.5	4.167	Low
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
Fauna	Loss of food, nest sites and refugia	Neg	Reversible	Relocate larger animals with the aid of specialists. Ensure relevant permits are in place.	2	1	3	2	1	3	2	4	Low
Fauna	Alienation of animals from the area	Neg	Reversible	Mining will only take place on designated areas, and will be restricted to office hours. No traps or hunting of any animals will be allowed. Mining will be done with the least possible habitat destruction. mining activities are only temporary. Inform staff, contractors and visitors to not harm fauna in the area.	2	1	3	2	1	3	2	4	Low
Safety	Health and safety risk posed by un-sloped areas	Neg	Reversible	The impact on health and safety due to un-sloped areas will be contained within the site boundary.	2	1	3	2	1	3	2	4	Low
Surface water	Increased risk of siltation of surface water bodies	Neg	Reversible	Ensure clean and dirty water separation and storm water management systems are established on site prior to construction taking place.	2	1	2	1.7	2	3	2.5	4.167	Low
Surface water	Downstream water quantity of catchment reduced	Neg	Reversible	-	2	1	2	1.7	2	3	2.5	4.167	Low
Groundwater	Quality and Quantity of groundwater could be adversely affected by mining activities	Neg	Reversible	Groundwater will only be used for domestic purposes and will not be directly affected by mining activities.	2	1	2	1.7	2	3	2.5	4.167	Low

(1) Cumulative Impacts

Table 18: Cumulative Impact Assessment of Tja Naledi-Barrage Bulk Sand Mine

Nature of Impact	Impact	Positive/Negative/Neutral Impact	Reversibility	Extent	Severity	Duration	Consequence	Probability	Frequency	Likelihood	Significance	Mitigation Rating	Mitigation
CONSTRUCTION AND OPERATIONAL PHASES													
ACTIVITY: Utilization of haul and access roads within the mining right area													
SUB ACTIVITY: Truck and heavy machinery operations													
Traffic & Safety	Increased potential for road incidences	Neg	Reversible	2	3	1	2	3	1	2	4	Low	All intersections with main tarred roads will be clearly signposted. Drivers will be enforced to keep to set speed limits. Trucks will be in road-worthy condition with reflective strips.
Traffic & Safety	Road degradation	Neg	Reversible	1	3	1	1.666667	2	1	1.5	2.5	Low	A fund will be set aside (with the two similar mines in close vicinity of the Tja Naledi) to maintain the serviceability of the road verge where the trucks approach or depart from the main road.

j) 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).

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.	
DEMARCATON 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	N/A	N/A
ESTABLISHMENT OF TEMPORARY OFFICE AND ABLUTION 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	Low	Control through proper site management	Low
STRIPPING AND STOCKPILING OF TOPSOIL	Visual impact due to removal of topsoil.	The visual impact may affect the aesthetics of the landscape.	Operational phase	Low – Medium	<u>Control:</u> Implementation of proper housekeeping	Low Medium –

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANE
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	Medium	<u>Control:</u> Dust suppression	Low – Medium
STRIPPING AND STOCKPILING OF TOPSOIL	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.	Operational phase	medium	<u>Control:</u> Noise control measures	Low
STRIPPING AND STOCKPILING OF TOPSOIL	Infestation of the topsoil heaps by weeds and invader plants.	Biodiversity	Operational phase	Low – Medium	<u>Control & Remedy:</u> Implementation of weed control and weed/invader plant management plan	Low
STRIPPING AND STOCKPILING OF TOPSOIL	Loss of topsoil due to incorrect storm water management	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Operational phase	Medium	<u>Control:</u> Storm water management	Low – Medium
STRIPPING AND STOCKPILING OF TOPSOIL	Contamination of area with hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	Medium	<u>Control:</u> Waste management	Low – Medium
STRIPPING AND STOCKPILING OF TOPSOIL	Surface disturbance	Topography Biodiversity	Operational phase	Medium	<u>Control:</u> Storm water management	Low – Medium
STRIPPING AND STOCKPILING OF TOPSOIL	Loss of natural vegetation				<u>Control:</u> Management of buffer areas and demarcation of work areas. <u>Modify:</u> Consider use of a less sensitive area	
STRIPPING AND STOCKPILING OF TOPSOIL	Soil erosion due to absence of vegetation	Loss of soil	Operational phase	Medium	<u>Control:</u> Proper site management.	Low – Medium
EXCAVATION	Visual intrusion associated with the	The visual impact may affect the aesthetics of	Operational phase	Medium	<u>Control:</u> Implementation of proper	Low – Medium

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANE
	excavation activities	the landscape.			housekeeping	
EXCAVATION	Dust nuisance due to excavation activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	Medium	<u>Control:</u> Dust Suppression	Low Medium –
EXCAVATION	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.	Operational phase	Medium	<u>Control:</u> Noise Control Measures	Low Medium –
EXCAVATION	Contamination of surface or groundwater due to effluent runoff from excavation area	the impact of surface and groundwater contamination due to the excavated area will be mitigated through berms and topsoil stockpiling	Operational phase	Medium	<u>Control:</u> Measures will be implemented as subscribed by DWS	Low
EXCAVATION	Unsafe working conditions for employees	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented	Operational phase	Medium	<u>Control:</u> Implementation of safety control measures	Low Medium –
EXCAVATION	Negative impact on the fauna and flora of the area	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away	Operational phase	Low	<u>Control:</u> Implementation of fauna protection measures	Low
EXCAVATION	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	Medium	<u>Control:</u> Waste Management	Low - Medium
EXCAVATION	Weed and invader plant infestation of the area	Biodiversity	Operational phase	Low - Medium	<u>Control & Remedy:</u> Implementation of Weed Control	Low - Medium

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANE
EXCAVATION	Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water	Operational phase	Low - Medium	<u>Control:</u> Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Low - Medium
TRANSPORTATION OF SAND AND AGGREGATES 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.	Operational phase	Medium	<u>Control:</u> Dust suppression	Low - Medium
	Impact on the access roads	All road users will be affected	Operational phase	Medium	<u>Control & Remedy:</u> Road management	Low - Medium
	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	Medium	<u>Control:</u> Noise control measures	Low - Medium
	Contamination of area with hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	Medium	<u>Control:</u> Waste Management	Low
SCREENING OF SAND AND AGGREGATES	Dust nuisance due to loading and transportation of the material	Should dust levels become excessive it may have an impact on surrounding landowners.	Operational phase	Medium	<u>Control:</u> Dust suppression	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.	Operational phase	Medium	<u>Control:</u> Noise Control Measures	Low - Medium
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Erosion of returned topsoil after rehabilitation	Soil erosion, may affect the agricultural potential of the site after closure of the	Decommissioning phase	Medium	<u>Control:</u> Soil Management and seeding of mined areas	Low - Medium

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANE
		mine.				
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Dust nuisance caused during landscaping activities	Should dust levels become excessive it may have an impact on surrounding landowners.	Decommissioning phase	Low - Medium	<u>Control:</u> Dust Suppression	Low
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	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.	Decommissioning phase	Medium	<u>Control:</u> Sloping of areas upon decommission	Low - Medium
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Noise nuisance caused by machinery	Should noise levels become excessive it may have an impact on surrounding landowners.	Decommissioning phase	Low - Medium	<u>Control:</u> Noise Management	Low
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Contamination of area with hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Decommissioning phase	Low - Medium	<u>Control:</u> Waste Management	Low
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Loss of reinstated topsoil due to the absence of vegetation	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Decommissioning phase	Low - Medium	<u>Control:</u> Storm water Management	Low
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Weeds and invader plant infestation of the area	Biodiversity	Decommissioning phase	Low - Medium	<u>Control & Remedy:</u> Implementation of Weed Control	Low

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

k) 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
Heritage Impact Assessment	<p>Although unlikely, sub-surface remains of heritage sites could still be encountered during the construction and mining activities associated with the project. Such sites would offer no surface indication of their presence due to the high state of alterations in some areas as well as heavy plant cover in other areas. The following indicators of unmarked sub-surface sites and graves could be encountered;</p> <ul style="list-style-type: none"> • Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate); • Bone concentrations, either animal or human; • Ceramic fragments such as pottery shards either historic or pre-contact; and • Stone concentrations of any formal nature. <p>Although no sites of heritage significance were identified within the proposed study area, the following recommendations are given should any sub-surface remains of heritage sites be identified as indicated above;</p>	<p>X</p> <p>X</p> <p>X</p> <p>X</p>	<p>Please refer to:</p> <p>Part A h) iv) (1) (a); and</p> <p>Part A t) i)</p>

	<ul style="list-style-type: none"> • All operators of excavation equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered. • All construction in the immediate vicinity (50m radius of the site should cease). • The heritage practitioner should be informed as soon as possible. • In the event of obvious human remains the SAPS should be notified. • Mitigate measures (such as refilling etc.) should not be attempted. • The area in a 50m radius of the find should be cordoned off with hazard tape. • Public access should be limited. • The area should be placed under guard. • No media statements should be released until such time as the heritage practitioner has had sufficient time to analyse the finds. 	<p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p> <p>X</p>	
<p>Comparative land use assessment</p>	<p>Given this project's strong large scale socio-economic benefits, we conclude that it is acceptable. The fact that relatively little land is impacted upon and that the Tja Naledi – Barrage Bulk Sand Mine Beafase economic footprint is going to be wider than district level also assists in making it acceptable from a sustainable development viewpoint. Hence this project is recommended from a sustainable development perspective.</p>	<p>X</p>	<p>Please refer to: Part A h) iv) (1) (a)</p>
<p>No other specialist studies were deemed necessary for this project as the project entails the establishment of the mining area over an area previously used for agriculture and mining.</p>			

I) Environmental impact statement

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

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

- The project entails the excavation mining of sand, aggregates and alluvial diamonds in an area previously used for mining. Due to the small area used for grazing and mining, mining of sand, aggregates and alluvial diamonds in the area was identified as a more viable use. As a result of the agricultural activities no natural areas needs to be disturbed.
- Mining will take place via a contractor (SPH Kundalila) who will excavate the material, load and haul the material to the processing plant.
- From the plant the material will be loaded via front end loader directly onto client's trucks
- 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 Vaal Eden – Barrage road 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. Tja Naledi- Barrage Bulk Sand Mine 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 and dry land maize production.

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

Should the application require to use the water for dust suppression, a water use application must be submitted to the Department of Water and Sanitation. As the river is more than 100m from the proposed mining area, the proposed mining activity is not anticipated to have a negative impact on the river. It is however proposed that the applicant conduct bi-annual water analysis of the water in the Vaal River to enable early identification of possible contamination.

VEGETATION

This vegetation has largely been transformed as a result of the previous mining activities. The development of the proposed mining area will therefore not have a negative impact on the surrounding area. The mining site itself is largely overpopulated with alien vegetation because of the previously mined area. The proposed mine is a good way to ensure mitigation of these alien plants in the rehabilitation period of the mining site.

Although no sensitive, protected or endangered species were identified during the site inspection, it is proposed that the applicant remove as little vegetation as possible. This will lessen the area to be managed for erosion and weed invasion purposes. Topsoil management must be implemented to ensure that topsoil is available upon rehabilitation of the area.

Due to the subsurface nature of bulbs the possibility of their occurrence cannot be excluded. If during construction any possible finds such plants must be replanted in a demarcated area.

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. 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.

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 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 Vaal Eden- Barrage road and other public roads surrounding the property contributes to the ambient noise of the area.

The noise to be generated at the proposed mining operation is expected to temporarily increase the noise levels of the area. 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 CHARACTER

No sites of archaeological or cultural importance were identified during the site inspection as the site has been extensively used for mining and agriculture purposes. Tja Naledi – Barrage Bulk Sand Mine will make use of temporary infrastructure during the mining operations. Workers will be transported to and from the site daily.

INFRASTRUCTURE

It is expected that the proposed processing (screening) 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. This will have a direct positive impact on the traffic volumes of the surrounding roads and price of the aggregate.

VISUAL EXPOSURE/ SENSE OF PLACE

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) Final Site Map

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

See the map indicating site activities attached as Appendix B.

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

The positive impacts associated with the project include:

- Job creation for approximately 6 employees indirectly contributing to the socio-economic status of the Parys area;
- The site falls within an already disturbed area and can be used for the establishment of the processing (screening) activities, no riparian vegetation will be impacted on;

- The sand, aggregate and alluvial diamonds to be mined will be used for the construction industry in the vicinity of the mining site, thereby indirectly contributing to infrastructure development,
- The project will assist the landowner and lawful users in diversification of the land use of 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.

The negative impacts associated with the project that was deemed to have a Low-Medium or Medium significance includes:

- | | |
|-------------------------------------------------------------------------------------------------------------|----------------------|
| • Disturbance of the geological strata | Medium - High |
| • Potential for loss of soil and damage to soil characteristics | Low -Medium |
| • Potential for erosion, loss of soil characteristics, compaction of soil & degradation through stockpiling | Low-Medium |
| • Loss of biodiversity | Low-Medium |
| • Alien invasive encroachment | Low |
| • Alteration of topography | Low-Medium |
| • Degrading of grazing potential for livestock farming | Low-Medium |
| • Veldt fire might seriously impact on surrounding land-use (livestock/irrigation of neighbouring farmers) | Low |
| • Visual intrusion due to the proposed project | Low – Medium |
| • Loss of and disturbance to surface archaeological sites | Medium - High |
| • Dust nuisance stemming from proposed project | Low – Medium |
| • Noise nuisance due to proposed activity | Low |
| • Loss of food, nest sites and refugia for fauna | Low |
| • Alienation of animals from the area | Low |
| • Potential hydrocarbon contamination which may reach downstream surface water bodies | Low |
| • Increased risk of siltation of surface water bodies | Low |
| • Downstream water quantity of catchment reduced | Low |
| • Potential damage to or destruction of sensitive faunal habitats: Pans & watering points | Low |
| • Quality and Quantity of groundwater could be adversely affected by mining activities | Low |

m) 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 condition of authorisation.

Management Objectives	Role	Management Outcomes
Visual Aspect /Sense of Place	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> • 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. Compliance to be monitored by the Environmental Control Officer. Dust monitoring consultant to check dust results and provide guidelines.	<ul style="list-style-type: none"> ▪ Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. ▪ Limit speed on the access roads to 40km/h to prevent the generation of excess dust. ▪ Spray 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. ▪ Assess effectiveness of dust suppression equipment. ▪ Re-vegetate all disturbed or exposed areas as soon as possible to prevent any dust source from being created. ▪ Thoroughly soak all stockpiles to ensure dust suppression on the site. ▪ Conduct formal dust monitoring on a monthly basis.
Noise Handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. Compliance to be monitored by the Noise Monitoring Specialist.	<ul style="list-style-type: none"> ▪ Ensure that employees and staff conduct themselves in an acceptable manner while on site. ▪ No loud music may be permitted at the mining area. ▪ Ensure that all mining vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act. ▪ Compliance with the appropriate legislation with respect to noise will be mandatory. ▪ Implement formal noise monitoring on a quarterly basis.
Management of weed/invaser plants	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> ▪ Implement a weed and invader plant control management plan. ▪ Control declared invader or exotic species on the rehabilitated areas. ▪ Keep the temporary topsoil stockpiles free of weeds.
Surface and Storm water Handling	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be	<ul style="list-style-type: none"> ▪ Divert storm water around the topsoil heaps and access roads to prevent erosion and loss of material. ▪ Divert runoff water around the stockpile areas with trenches and contour structures to prevent erosion of the work areas. ▪ Ensure that water from the wash bay into the oil sump. ▪ Conduct mining in accordance with the Best Practice Guideline for

Management Objectives	Role	Management Outcomes
	monitored by the Environmental Control Officer.	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.
Topsoil management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> • 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 1.5m in order to preserve microorganism within the topsoil. <ul style="list-style-type: none"> ▪ 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.	<ul style="list-style-type: none"> • Contain all activities within the boundaries of the approved processing area. <ul style="list-style-type: none"> ▪ Demarcate, signpost and manage the 20m 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.	<ul style="list-style-type: none"> • 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.
Management of health and safety risks	Site Manager to ensure compliance with the guidelines as stipulated in the EMPr. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> ▪ Ensure that workers have access to the correct PPE as required by law. ▪ Ensure all operations comply with the Occupational Health and Safety Act.
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	<ul style="list-style-type: none"> ▪ Store all hazardous materials or substances in a closed storage facility with an impermeable floor. ▪ Storage area to meet the following conditions: <ul style="list-style-type: none"> ▪ 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

Management Objectives	Role	Management Outcomes
		<p>maximum capacity.</p> <ul style="list-style-type: none"> ▪ 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. ▪ 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.
Waste management	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPR.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ▪ 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 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.
Management of access roads	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMP.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> ▪ Maintain newly constructed access roads so as to minimise dust, erosion or undue surface damage. ▪ Divert storm water around the access roads to prevent erosion. ▪ Erosion of access road: 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 proposed activities.

Management Objectives	Role	Management Outcomes
Protection of Cultural or Heritage Artefacts	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> • 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.
After care on rehabilitated areas	<p>Site Manager to ensure compliance with the guidelines as stipulated in the EMPr.</p> <p>Compliance to be monitored by the Environmental Control Officer.</p>	<ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> ▪ Monitor all rehabilitated areas for erosion, and appropriately stabilized if any erosion occurs.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

The management objectives listed in this report under Point m above should be considered for inclusion in the environmental authorisation.

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.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised**i) Reasons why the activity should be authorised or not.**

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

ii) Conditions that must be included in the authorisation

The management objectives listed in this report under Point m should be considered for inclusion in the environmental authorisation.

q) Period for which the Environmental Authorisation is required.

The applicant requests the Environmental Authorisation to be valid for a ten (10)-year period.

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 Basic 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.

i) Explain how the aforesaid amount was derived

The annual amount required to manage and rehabilitate the environment was estimated to be R684 901.71. A Bank Guarantee is provided for the proposed site. Please note that this document is an amendment to the current EMP.

ii) Confirm that this amount can be provided 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 mining operation will be self-funded through income generated by sales of the sand, aggregate and alluvial diamonds mined. A bank guarantee was ceded to the DMR for the required amount in the 2014 EMP.

t) Specific 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 an Appendix)

The social impact of the proposed development was considered at the macro (provincial) meso (district) and micro (farm) levels. This was investigated thoroughly as part of the social and labour plan as contemplated in regulation 46 of the Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) that makes out part of this application. Please refer Appendix J.

The relative small extent of the proposed mining operations implies that the development will not have a significant social impact at the macro level. The financial gain from any such mining operation always has the possibility to contribute positively towards the socioeconomic aspect at any level. The mine has a very large beneficial impact on the development projects in Gauteng and the Vaal Triangle.

Meso (district) level

As for the macro level, the relative small extent of the proposed mining operations implies that the development will not have a significant social impact at the meso level. The financial gain from any mining operation always has the potential to contribute positively towards the socio-economic aspect at any level.

Micro (farm) level

No local labourers will work in the mining operation or will be sourced from the immediate area. As such the proposed development will not contribute to the Micro (farm) level. Little to no impact will occur on neighbouring properties socio-economic conditions. Due to the small scale of the operation, no influx of workers is expected.

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

Visual exposure / Sense of Place:

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 surrounding mines in the 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.

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 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 Vaal Eden – Barrage road and other public roads surrounding the property contributes to the ambient noise of the area. The noise to be generated at the proposed site operation is expected to temporarily increase the noise levels of the area. 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 footprint area will not require the building of any permanent structures. The proposed production of sand, aggregate and alluvial diamonds on the property will also reduce the amount of trucks delivering materials, from outside sources. This will have a direct positive impact on the traffic volumes of the surrounding roads and price of the aggregate.

(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 the Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 herein).

The specialist report (Heritage, 2015), did indicate a single stone age tools and old buildings that would require protection. No mining will take place near the buildings and the recommendations of the report will be followed should any heritage features be discovered as part of the mining operations. Please refer to Appendix H for the Heritage Impact Assessment that was conducted.

No cultural aspects were identified that could be impacted upon by the mining operations.

u) Other matters 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)

As mentioned earlier, no other alternative sites needed to be investigated as this is an amendment of the current EMPR. The site was identified during the assessment phase of the environmental impact assessment (2014 assessment), by the applicant and project team, and was therefore selected as the preferred alternative.

As discussed earlier the following alternatives were considered:

1. Mining area – The proposed mining area over a 437ha area
2. No-go Alternative.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft Environmental Management Programme.

- a) Details of the EAP, (Confirm that the requirements 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 I as required.

- b) Description of the Aspects of the Activity** (Confirm that the requirements 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 draft 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 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 B 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)**

The environment affected by the mining operations will be rehabilitated, as far as is practicable, to its natural state or to a predetermined and agreed to standards or land use which conforms with the concept of sustainable development. The affected environment will be maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. This will be done by complying with the conditions in the environmental management program below, and relevant statutory requirements. The contractor and employee will be made aware of their environmental responsibilities and will be empowered to executed the work program in compliance with the requirements of this EMPR.

Rehabilitation of Access Roads

- Whenever the mining right is suspended, cancelled or abandoned or if it lapses and Tja Naledi – Barrage Bulk Sand Mine does not wish to renew the right, any access road or portions thereof, constructed by Sweet Sensation and which will no longer be required by the landowner, will be removed and rehabilitated to the satisfaction of the Regional Manager.
- Any gate of fence erected by Tja Naledi – Barrage Bulk Sand Mine which is not required by the landowner, will be removed and the situation restored to the pre mining situation.
- Roads will be ripped or ploughed, and if necessary appropriately fertilised (based on a soil analysis) to ensure the regrowth of vegetation. Imported road construction material that may be regrow of vegetation will be removed and disposed of in an approved manner prior to rehabilitation.
- Structure such as berms will be installed to prevent erosion of the rehabilitated roads.
- If a reasonable assessment indicated the re-establishment of vegetation is unacceptably slow, the request of the Regional Manager, the soil will be analysed and any deleterious effect on the soil arising from the mining operation, will be corrected and the area be seeded with a seed mix to the Regional Manager's specifications.

Rehabilitation of The Secured Storage Area

- On completion of mining operations, the above areas will be cleared of any contaminated soils, which will be disposed of as referred to in the section above.
- The surface will then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent to the site, will be spread evenly to its original depth over the whole area. The areas will then be fertilised if necessary (based on a soil analysis).
- The site will be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- If a reasonable assessment indicated that the re-establishment of vegetation is unacceptable slow, at the request of the Regional Manager, the soil will be analysed and any deleterious effect on the soil arising from the mining operation will be corrected and the area be seeded with a seed mix to the regional manager specification.

(2) Decommission and Closure Phases

(a) Rehabilitation of the mining area

- Rehabilitation will be ongoing and conform to 1 ha being stripped of topsoil and 1ha being rehabilitated after the overburden is worked back into the excavation.
- Thus there will only be 1ha of land open (2 strips) for rehabilitation in operational times. One excavator will be used to excavate the sand, aggregate and alluvial diamonds.
- 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.

- 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.

(b) Rehabilitation of plant, office and service areas

- 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.
 - The topsoil will be placed back as a growth medium and the sides of the excavation will be sloped with acceptable contours to prevent soil erosion.
 - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- Photographs of the office sites, before and during mining operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.
- 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.

(c) Final rehabilitation

- Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding and maintenance, and weed / alien clearing.
- All Temporary Infrastructures, equipment, plant, 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, proof of this removal will be kept on file at the applicant's office. 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.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

(d) Seeding of the area

Once the excavation slopes have been shaped and the topsoil 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) Volume and rate of water use required for the operation

Water is abstracted from the two (2) boreholes that is located on the property on a daily basis for dust suppression purposes and for potable water at the site. A water truck will be used to spray access roads to alleviate dust generation. It is proposed that the mining activities will require approximately 20 000 – 40 000 l of water per day.

iii) Has a water use licence has been applied for?

The applicant has applied for general authorization (DWS) for the water uses that is applicable to the project in October 2017.

iv) Impacts to be mitigated in their respective phases

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE STANDARDS WITH	TIME PERIOD FOR IMPLEMENTATION
(as listed in 2.11.1)	of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure	(volumes, tonnages and hectares or m ²)	(describe how each of the recommendations herein will remedy the cause of pollution or degradation and migration of pollutants)	(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either – Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Demarcation of site with visible beacons	Construction / Site Establishment phase	437.8330ha	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. <ul style="list-style-type: none"> MHSA, 1996 OHSA, 1993 	Beacons need to be in place throughout the life of the activity.
STRIPPING AND STOCKPILING OF TOPSOIL & EXCAVATION	Operational phase	437.8330ha	Visual Mitigation: <ul style="list-style-type: none"> 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. 	Land use zoning: <ul style="list-style-type: none"> Free State LUPA Ngwanthe Municipality: Land Use Planning Bylaws The property is zoned for agriculture as primary use. A lawyers letter has been compiled by Weavind & Weavind Attorneys stating that no land rezoning is needed for this Section 102 application. 	Throughout operational phase

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE STANDARDS WITH	TIME PERIOD FOR IMPLEMENTATION
STRIPPING AND STOCKPILING OF TOPSOIL & LOADING AND TRANSPORTING & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA & EXCAVATION	Operational phase & Decommissioning phase	437.8330ha	<p>Dust Handling:</p> <ul style="list-style-type: none"> 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. 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. 	<p>Dust Handling:</p> <ul style="list-style-type: none"> NEM:AQA, 2004 Regulation 6(1) 	Throughout operational and decommissioning phases
STRIPPING AND STOCKPILING OF TOPSOIL & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA & EXCAVATION	Operational phase & Decommissioning phase	437.8330ha	<p>Noise Handling:</p> <ul style="list-style-type: none"> 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. 	<p>Noise Handling:</p> <ul style="list-style-type: none"> 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
STRIPPING AND STOCKPILING OF TOPSOIL &	Operational phase & Decommissioning phase	437.8330ha	<p>Management of weed- or invader plants:</p> <ul style="list-style-type: none"> A weed and invader plant management plan must be implemented at the site to ensure 	<p>Management of weed- or invader plants:</p> <ul style="list-style-type: none"> NEMBA (Act No. 10 of 2004). 	Throughout operational and decommissioning phases

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE STANDARDS WITH	TIME PERIOD FOR IMPLEMENTATION
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA			<p>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.</p> <ul style="list-style-type: none"> • Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used: <ul style="list-style-type: none"> ○ "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. 	<ul style="list-style-type: none"> • GNR 598 and 599 of 2014 	
STRIPPING AND STOCKPILING OF TOPSOIL	Operational phase	437.8330ha	<p><u>Loss of topsoil due to incorrect storm water management</u></p> <ul style="list-style-type: none"> • 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. 	<p><u>Loss of topsoil due to incorrect storm water management:</u></p> <ul style="list-style-type: none"> • 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. 	Throughout operational phase

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE STANDARDS WITH	TIME PERIOD FOR IMPLEMENTATION
			<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> ○ 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. 		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<p>STRIPPING AND STOCKPILING OF TOPSOIL & LOADING AND TRANSPORTING & EXCAVATION</p>	<p>Operational phase</p>	<p>437.8330ha</p>	<p><u>Negative impact on fauna that may enter the area:</u></p> <ul style="list-style-type: none"> 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. 	<p><u>Negative impact on fauna that may enter the area:</u></p> <ul style="list-style-type: none"> 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. 	<p>Throughout operational phase</p>
<p>STRIPPING AND STOCKPILING OF TOPSOIL & LOADING AND TRANSPORTING & SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA & EXCAVATION</p>	<p>Operational phase & Decommissioning phase</p>	<p>437.8330ha</p>	<p><u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u></p> <ul style="list-style-type: none"> 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 litre 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. 	<p><u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u></p> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply. 	<p>Throughout operational and decommissioning phases</p>

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE STANDARDS WITH	TIME PERIOD FOR IMPLEMENTATION
			<ul style="list-style-type: none"> 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. 		

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	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD TO BE ACHIEVED
whether listed or not listed	(Including the potential impacts for cumulative impacts)		In which impact is anticipated	(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, 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.	

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
DEMARCATON 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. <ul style="list-style-type: none"> MHSA, 1996 OHSA, 1993
ESTABLISHMENT OF TEMPORARY OFFICE AND ABLUTION 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	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	Visual impact due to removal of topsoil.	The visual impact may affect the aesthetics of the landscape.	Operational phase	<u>Control:</u> Implementation of proper housekeeping	<u>Land use zoning:</u> <ul style="list-style-type: none"> Free State LUPA Ngwathe Municipality: Land Use Planning Bylaws The property is zoned for agriculture as primary use. A lawyer's letter has been compiled by Weavind & Weavind Attorneys stating that no land rezoning is needed for this Section 102 application.
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	<u>Control:</u> Dust suppression	<u>Dust Handling:</u> <ul style="list-style-type: none"> NEM:AQA, 2004 Regulation 6(1)

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
STRIPPING AND STOCKPILING OF TOPSOIL	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.	Operational phase	<u>Control:</u> Noise control measures	<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
STRIPPING AND STOCKPILING OF TOPSOIL	Infestation of the topsoil heaps by weeds and invader plants.	Biodiversity	Operational phase	<u>Control & Remedy:</u> Implementation of weed control and weed/invader plant management plan	Management of weed- or invader plants: • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014.
STRIPPING AND STOCKPILING OF TOPSOIL	Loss of topsoil due to incorrect storm water management	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Operational phase	<u>Control:</u> Storm water 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.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
STRIPPING AND STOCKPILING OF TOPSOIL	Contamination of area with hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	<u>Control:</u> Waste management	Contamination of surface or groundwater due to hazardous spills not cleaned: <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.
STRIPPING AND STOCKPILING OF TOPSOIL	Surface disturbance	Topography Biodiversity	Operational phase	<u>Control:</u> Storm water management	<u>Negative impact on biodiversity of the area:</u> NEM:BA, 2004
STRIPPING AND STOCKPILING OF TOPSOIL	Loss of natural vegetation			<u>Control:</u> Management of buffer areas and demarcation of work areas. <u>Modify:</u> Consider use of a less sensitive area	<u>Negative impact on biodiversity of the area (Site Alternative 1):</u> • NEM:BA, 2004
STRIPPING AND STOCKPILING OF TOPSOIL	Soil erosion due to absence of vegetation	Loss of soil	Operational phase	<u>Control:</u> Proper site management.	<u>Loss of soil due to un-vegetated areas:</u> <ul style="list-style-type: none"> NEMBA (Act No. 10 of 2004). NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
EXCAVATION	Visual intrusion associated with the excavation activities	The visual impact may affect the aesthetics of the landscape.	Operational phase	<u>Control:</u> Implementation of proper housekeeping	<u>Land use zoning:</u> <ul style="list-style-type: none"> Free State LUPA Ngwathe Municipality: Land Use Planning Bylaws The property is zoned for agriculture as primary use. A lawyers letter has been compiled by

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
					Weavind & Weavind Attorneys stating that no land rezoning is needed for this Section 102 application.
EXCAVATION	Dust nuisance due to excavation activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.	Operational phase	<u>Control:</u> Dust Suppression	<u>Dust Handling:</u> • NEM:AQA, 2004 Regulation 6(1)
EXCAVATION	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.	Operational phase	<u>Control:</u> Noise Control Measures	<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
EXCAVATION	Contamination of surface or groundwater due to effluent runoff from excavation area	the impact of surface and groundwater contamination due to the excavated area will be mitigated through berms and topsoil stockpiling	Operational phase	<u>Control:</u> Measures will be implemented as subscribed by DWS	-
EXCAVATION	Unsafe working conditions for employees	The Unsafe working conditions should only impact the applicant. Safety measures will be implemented	Operational phase	<u>Control:</u> Implementation of safety control measures	<u>The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure.</u> • MHSA, 1996 • OHSA, 1993

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
EXCAVATION	Negative impact on the fauna and flora of the area	The impact of the fauna of the area will not be significant as vibration and noise will drive the fauna away	Operational phase	<u>Control:</u> Implementation of fauna protection measures	<u>Negative impact on fauna that may enter the area:</u> <ul style="list-style-type: none"> 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.
EXCAVATION	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	<u>Control:</u> Waste Management	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply
EXCAVATION	Weed and invader plant infestation of the area	Biodiversity	Operational phase	<u>Control & Remedy:</u> Implementation of Weed Control	<u>Management of weed- or invader plants:</u> <ul style="list-style-type: none"> The National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
EXCAVATION	Potential impact of mining activities on the runoff and infiltration of storm water.	Surface water	Operational phase	<u>Control:</u> Implement storm water control measures. Measures will be implemented as subscribed by DWS.	Loss of topsoil due to incorrect storm water management: <ul style="list-style-type: none"> • 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.
TRANSPORTATION OF SAND AND AGGREGATES 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.	Operational phase	<u>Control:</u> Dust suppression	<u>Dust Handling:</u> <ul style="list-style-type: none"> • 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
	Impact on the access roads	All road users will be affected	Operational phase	<u>Control & Remedy:</u> Road management	<u>Degradation of the gravel access road:</u> <ul style="list-style-type: none"> • 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.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
	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	<u>Control:</u> Noise control measures	<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
	Contamination of area with hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Operational phase	<u>Control:</u> Waste Management	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> • NWA, 1998 • NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.
SCREENING OF SAND AND AGGREGATES	Dust nuisance due to loading and transportation of the material	Should dust levels become excessive it may have an impact on surrounding landowners.	Operational phase	<u>Control:</u> Dust suppression	<u>Dust Handling:</u> • 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.	Operational phase	<u>Control:</u> Noise Control Measures	<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

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	COMPLIANCE WITH STANDARD / STANDARD TO BE ACHIEVED
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Erosion of returned topsoil after rehabilitation	Soil erosion, may affect the agricultural potential of the site after closure of the mine.	Decommissioning phase	<u>Control:</u> Soil Management and seeding of mined areas	<u>Erosion of returned topsoil after rehabilitation:</u> <ul style="list-style-type: none"> • NEM:BA, 2004 • MPRDA, 2008 The replacement of the topsoil and sloping of the area is of utmost importance to ensure the effective future use of the area for agricultural purposes. • Rehabilitation cannot be considered complete until the first cover crop is well established.
	Dust nuisance caused during landscaping activities	Should dust levels become excessive it may have an impact on surrounding landowners.	Decommissioning phase	<u>Control:</u> Dust Suppression	<u>Dust Handling:</u> <ul style="list-style-type: none"> • NEM:AQA, 2004 Regulation 6(1)
	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.	Decommissioning phase	<u>Control:</u> Sloping of areas upon decommission	-
	Noise nuisance caused by machinery	Should noise levels become excessive it may have an impact on surrounding landowners.	Decommissioning phase	<u>Control:</u> Noise Management	<u>Noise Handling:</u> <ul style="list-style-type: none"> • 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
	Contamination of area with hazardous waste materials	Contamination may cause surface or ground water pollution if not addressed	Decommissioning phase	<u>Control:</u> Waste Management	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> • NWA, 1998 • NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principle must apply.
	Loss of reinstated topsoil due to the absence of vegetation	Loss of topsoil will affect the rehabilitation of the processing area and the future agricultural potential of the site.	Decommissioning phase	<u>Control:</u> Storm water Management	<u>Erosion of returned topsoil after rehabilitation:</u> <ul style="list-style-type: none"> • NEM:BA, 2004 • MPRDA, 2008 The replacement of the topsoil and sloping of the area is of utmost importance to ensure the effective future use of the area for agricultural purposes. • Rehabilitation cannot be considered complete until the first cover crop is well established.
	Weeds and invader plant infestation of the area	Biodiversity	Decommissioning phase	<u>Control & Remedy:</u> Implementation of Weed Control	Management of weed- or invader plants: <ul style="list-style-type: none"> • NEMBA (Act No. 10 of 2004). • Alien and Invasive Species Regulation GNR 598 and 599 of 2014.

f) Impact Management Actions

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

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
whether listed or not listed (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..)	(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. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation. 	Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either: Upon cessation of the individual activity Or. Upon the cessation of mining bulk sampling or alluvial diamond prospecting as the case may be.	(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
DEMARICATION OF SITE WITH VISIBLE BEACONS	No impact could be identified other than the beacons being outside the boundaries of the approved processing area.	Control through management and monitoring	Beacons need to be in place throughout the life of the mine.	Processing of the waste rock/stone is only allowed within the boundaries of the approved processing area. <ul style="list-style-type: none"> • MHSA, 1996 • OHSA, 1993
Establishment of temporary office and ablution infrastructure within boundaries of site.	If the infrastructure is established within the boundaries of the approved mining area, no impact could be identified.	Control through proper site management	Construction / Site Establishment phase	Not applicable as these are mobile and will be removed during rehabilitation and closure of the site.
STRIPPING AND STOCKPILING OF TOPSOIL	Visual impact due to removal of topsoil.	<u>Control:</u> Implementation of proper housekeeping	Throughout operational phase	<u>Land use zoning:</u> <ul style="list-style-type: none"> • Free State Town Planning Repeal • Ngwanthe Local Municipality: Land



ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
				Use Planning Bylaws <ul style="list-style-type: none"> The property is zoned for agriculture as primary use. A lawyers letter has been compiled by Weavind & Weavind Attorneys stating that no land rezoning is needed for this Section 102 application.
	Loss of natural vegetation	<u>Control:</u> Management of buffer areas and demarcation of work areas	Throughout operational phase	<u>Negative impact on biodiversity of the area (Site Alternative 1):</u> <ul style="list-style-type: none"> NEM:BA, 2004
	Loss of natural vegetation	<u>Modify:</u> Consider use of a less sensitive area	Throughout operational phase	<u>Negative impact on biodiversity of the area (Site Alternative 2):</u> <ul style="list-style-type: none"> NEM:BA, 2004
	Dust nuisance caused by the disturbance of soil.	<u>Control:</u> Dust suppression	Throughout operational phase	<u>Dust Handling:</u> <ul style="list-style-type: none"> NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery stripping and stockpiling the topsoil	<u>Control:</u> Noise control measures	Throughout operational phase	<u>Noise Handling:</u> <ul style="list-style-type: none"> 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
	Infestation of the topsoil heaps by weeds and invader plants.	<u>Control & Remedy:</u> Implementation of weed control and weed/invader plant management plan	Throughout operational phase	<u>Management of weed- or invader plants:</u> <ul style="list-style-type: none"> The National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014.

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	Loss of topsoil due to incorrect storm water management	<u>Control:</u> Storm water management	Throughout operational phase	<u>Loss of topsoil due to incorrect storm water management:</u> <ul style="list-style-type: none"> NEMBA, 2004 NEMA, 1998 NWA, 1998 The replacement of the topsoil is of utmost importance to ensure the effective future use of the area for agricultural purposes
	Contamination of area with hazardous waste materials	<u>Control:</u> Waste management	Throughout operational phase	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Surface disturbance	<u>Control:</u> Proper site management	Throughout Operational phase	<u>Negative impact on biodiversity of the area:</u> NEM:BA, 2004
	Soil erosion due to absence of vegetation	<u>Control:</u> Proper site management.	Throughout Operational phase	<u>Loss of soil due to un-vegetated areas:</u> <ul style="list-style-type: none"> NEMBA (Act No. 10 of 2004). NEMA, 1998 Bare areas need to be re-vegetation to prevent soil erosion.
EXCAVATION	Visual intrusion associated with the excavation activities	<u>Control:</u> Implementation of proper housekeeping	Throughout Operational phase	<u>Land use zoning:</u> <ul style="list-style-type: none"> Free State Town Planning Repeal Ngwanthe Local Municipality: Land Use Planning Bylaws The property is zoned for agriculture as primary use. A lawyer's letter has been compiled by Weavind & Weavind Attorneys stating that no land rezoning is needed for this Section 102 application.
	Dust nuisance due to excavation activities	<u>Control:</u> Dust suppression	Throughout Operational phase	<u>Dust Handling:</u> NEM:AQA, 2004 Regulation 6(1)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	Noise nuisance generated by excavation equipment	<u>Control:</u> Noise control measures Operational phase	Throughout Operational phase	<u>Noise Handling:</u> <ul style="list-style-type: none"> 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
	Unsafe working conditions for employees	<u>Control:</u> Implementation of safety control measures	Throughout Operational phase	The Occupational Health and safety act in conjunction with the Mine Health and Safety act as mitigation measure. <ul style="list-style-type: none"> MHSA, 1996 OHSA, 1993
	Negative impact on the fauna and flora of the area	<u>Control:</u> Implementation of fauna protection measures	Throughout Operational phase	Protection of Fauna on site: <ul style="list-style-type: none"> NEM:BA, 2004
	Contamination of area with hydrocarbons or hazardous waste materials	<u>Control:</u> Waste management	Throughout Operational phase	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Weed and invader plant infestation of the area	<u>Control & Remedy:</u> Implementation of weed control	Throughout Operational phase	<u>Management of weed- or invader plants:</u> <ul style="list-style-type: none"> The National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014.
	Contamination of surface or groundwater due to effluent runoff from excavation area	<u>Control:</u> Measures will be implemented as subscribed by DWS	Throughout Operational phase	<u>Dust Handling:</u> NEM:AQA, 2004 Regulation 6(1)
LOADING AND TRANSPORTING	Dust nuisance due to loading and transportation of the material	<u>Control:</u> Dust suppression	Operational phase	<u>Noise Handling:</u> <ul style="list-style-type: none"> 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
	Impact on the access roads	<u>Control & Remedy:</u> Road management	Operational phase	<u>Degradation of the gravel access road:</u> <ul style="list-style-type: none"> NRTA, 1996 The gravel access road needs to be

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
				monitored for signs of degradation. Should any signs become apparent immediate rectification actions must be implemented.
	Noise nuisance caused by vehicles	<u>Control:</u> Noise control measures	Operational phase	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Contamination of area with hazardous waste materials	<u>Control:</u> Waste management	Operational phase	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998 NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.
CRUSHING AND SCREENING AGGREGATES	Dust nuisance due to loading and transportation of the material	<u>Control:</u> Dust suppression	Operational phase	<u>Dust Handling:</u> NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by crushing plant.	<u>Control:</u> Noise control measures	Operational phase	<u>Noise Handling:</u> <ul style="list-style-type: none"> 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
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA	Dust nuisance caused during landscaping activities	<u>Control:</u> Dust suppression	Throughout decommissioning phase	<u>Dust Handling:</u> <ul style="list-style-type: none"> NEM:AQA, 2004 Regulation 6(1)
	Noise nuisance caused by machinery	<u>Control:</u> Noise management	Throughout decommissioning phase	<u>Noise Handling:</u> <ul style="list-style-type: none"> 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
	Contamination of area with hazardous waste materials	<u>Control:</u> Waste management	Throughout decommissioning phase	<u>Contamination of surface or groundwater due to hazardous spills not cleaned:</u> <ul style="list-style-type: none"> NWA, 1998

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
				<ul style="list-style-type: none"> NEM: WA, 2008 Every precaution must be taken to prevent contamination. The precautionary principal must apply.
	Loss of reinstated topsoil due to the absence of vegetation	<u>Control:</u> Storm water management	Throughout decommissioning phase	<p><u>Erosion of returned topsoil after rehabilitation:</u></p> <ul style="list-style-type: none"> NEM:BA, 2004 MPRDA, 2008 The replacement of the topsoil and sloping of the area is of utmost importance to ensure the effective future use of the area for agricultural purposes. Rehabilitation cannot be considered complete until the first cover crop is well established.
	Erosion of returned topsoil after rehabilitation	<u>Control:</u> Soil management and seeding of mined areas	Throughout decommissioning phase	<p><u>Management of plants and seeded areas:</u></p> <ul style="list-style-type: none"> The National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004)
	Weeds and invader plant infestation of the area	<u>Control & Remedy:</u> Implementation of weed control	Throughout decommissioning phase	<p><u>Management of weed- or invader plants:</u></p> <ul style="list-style-type: none"> The National Environmental Biodiversity Act [NEMBA] (Act No. 10 of 2004) Alien and Invasive Species Regulation GNR 598 and 599 of 2014.

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 the Regulation.**

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.
- 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.

The Draft Basic Assessment Report, included 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 will be added to the Final Basic Assessment 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 D. 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 D will comply with the minimum closure objectives as prescribed by DMR and detailed below, and therefore is deemed to be compatible:

Rehabilitation of the excavated area:

- Due to the impracticality of importing large volumes of fill to restore the mining area to its original topography, the rehabilitation option is to develop the mining into a minor landscape feature.
- 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.
 - 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, 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	Sand
Saleable mineral by-product	None

Mine type	Gravel
Saleable mineral by-product	None

Mine type	Diamonds and Precious Stones
Saleable mineral by-product	None

Primary Risk Class

According to Tables B.12 or B.13

Primary risk ranking	Class C
Revised risk ranking	N/A

Environmental sensitivity of the mine area

According to Table B.4

Environmental sensitivity of the mine	Low
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Level of information

According to Step 4.1

Level of information available	Extensive
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Identification of closure components

According to Table B.5 and site-specific conditions

Component No.	Main description	Applicability of closure components (Circle Yes or No)	
		Open-cast Mine	
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 Comment: Only the access road from the existing road to the mine area.	YES	
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	-	NO
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing)	-	NO
8(C)	Rehabilitation of processing waste deposits and evaporation	-	NO

Component No.	Main description	Applicability of closure components (Circle Yes or No)	
		Open-cast Mine	
	ponds (acidic, metal-rich)		
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	-

Unit rates for closure components

According to Table B.6 master rates and multiplication factors for applicable closure components. The master rate from the DMR Master Rates table for financial provision of 2017 has been used.

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	36	-
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	212 440	0.04
7	Sealing of shafts, adits and inclines	-	-
8(A)	Rehabilitation of overburden and spoils		
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	112 192	1.00
11	River diversions	-	-
12	Fencing		
13	Water management (Separating clean and dirty water,	-	-

Component No.	Main description	Master rate	Multiplication factor
	managing polluted water and managing the impact on groundwater)		
14	2 to 3 years of maintenance and aftercare	14 930	-

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

CALCULATION OF THE QUANTUM							
Mine:	Tja Naledi Beafase Investment Holding (Pty) Ltd	Location:	Barrage Bulk Sand Mine				
Evaluators:	Yolandie Coetzee Greenmined Environmental	Date:	24/8/2017				
No.:	Description:	Unit:	A Quantity	B Master rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
			Step 4.5	Step 4.3	Step 4.3	Step 4.4	
1	Dismantling of processing plant & related structures (incl. overland conveyors & Power lines)	m ³	0.00	15.00	1.00	1.10	R 0.00
2 (A)	Demolition of steel buildings & Structures	m ²	0.00	203.00	1.00	1.10	R 0.00
2 (B)	Demolition of reinforced concrete buildings & structures	m ²	0.00	299.00	1.00	1.10	R 0.00
3	Rehabilitation of access roads	m ²	3000.00	36.00	1.00	1.10	R 118,800.00
4 (A)	Demolition & rehabilitation of electrified railway lines	m	0.00	352.00	1.00	1.10	R 0.00
4 (B)	Demolition & rehabilitation of non-electrified railway lines	m	0.00	192.00	1.00	1.10	R 0.00
5	Demolition of housing &/or administration facilities	m ²	0.00	405.00	1.00	1.10	R 0.00
6	Opencast rehabilitation including final voids & ramps	ha	1.00	212440.00	0.04	1.10	R 9,347.36
7	Sealing of shafts, adits & inclines	m ³	0.00	109.00	1.00	1.10	R 0.00
8 (A)	Rehabilitation of overburden & spoils	ha	1.30	141626.00	1.00	1.10	R 202,525.18
8 (B)	Rehabilitation of processing waste deposits & evaporation ponds (basic, salt producing waste)	ha	0.00	176393.00	1.00	1.10	R 0.00
8 (C)	Rehabilitation of processing waste deposits & evaporation ponds (acidic, metal-rich waste)	ha	0.00	512329.00	0.51	1.10	R 0.00
9	Rehabilitation of subsided areas	ha	0.00	118591.00	1.00	1.10	R 0.00
10	General surface rehabilitation	ha	0.00	112192.00	1.00	1.10	R 0.00
11	River diversions	ha	0.00	112192.00	1.00	1.10	R 0.00
12	Fencing	m		128.00	1.00	1.10	R 0.00
13	Water management	ha	0.00	42659.00	0.17	1.10	R 0.00
14	2 to 3 years of maintenance & aftercare	ha	9.90	14930.00	1.00	1.10	R 162,587.70
15 (A)	Specialist study					1.10	R 0.00
15 (B)	Specialist study					1.10	R 0.00
							R 493,260.24

		Sub Total 1 (Sum of items 1 to 15 Above)	
Weighting factor 2 (step 4.4)		Change according to urban, peri-urban and remote	1.05
		6.0% of Subtotal 1	R 31,075.40
2	Contingency	10.0% of Subtotal 1	R 51,792.33
		Sub Total 3 (Subtotal 1 plus sum of management & contingency)	R 600,790.97
		VAT (14%)	R 84,110.74
		(Subtotal 3 plus VAT) GRAND TOTAL	R 684,901.71

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 684 901.71**.

(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.

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

- (g) Monitoring of Impact Management Actions**
- (h) Monitoring and reporting frequency**
- (i) Responsible persons**
- (j) Time period for implementing impact management actions**
- (k) Mechanisms for monitoring compliance**

NAME OF ACTIVITY	IMPACTS REQUIREING 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, roads, pipelines, power lines, conveyors, etc...etc. Etc.)				
DEMARICATION OF SITE WITH VISIBLE BEACONS.	Maintenance of beacons	<ul style="list-style-type: none"> 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. 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> Ensure beacons are in place throughout the life of the activity. 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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. 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> Minimize the visual impact of the activity on the surrounding environment 	<ul style="list-style-type: none"> 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	Dust Monitoring: <ul style="list-style-type: none"> The dust generated by the processing activities must be continuously monitored, and 	Dust Handling and Monitoring: <ul style="list-style-type: none"> Dust suppression equipment such as a water car and water dispenser. The applicant already has this 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. 	<ul style="list-style-type: none"> Throughout Construction, Operational and Decommissioning Phase Daily compliance monitoring by site management. Monthly compliance monitoring of site by fallout dust monitoring consultant.

NAME OF ACTIVITY	IMPACTS REQUIREING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	addressed by the implementation of dust suppression methods.	equipment available.	Role: <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Quarterly compliance monitoring of site by an Environmental Control Officer. Annual compliance monitoring of site by an Independent Environmental
STRIPPING AND STOCKPILING OF TOPSOIL	Noise Monitoring <ul style="list-style-type: none"> The noise impact should be contained within the boundaries of the property, as it will represent the current activities. 	Noise Handling and Monitoring: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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 REQUIREING 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	Management of weed or invader plants <ul style="list-style-type: none"> The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed. 	Management of weed or invader plants: <ul style="list-style-type: none"> Removal of weeds must be manually or by the use of an approved herbicide. 	Responsibility: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Throughout Operational and Decommissioning Phase Daily compliance monitoring by site management. Quarterly compliance monitoring of site by an Environmental Control Officer
STRIPPING AND STOCKPILING OF TOPSOIL	Topsoil management	Topsoil Handling: <ul style="list-style-type: none"> 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 from overburden. 	Responsibility: <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 REQUIREING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			mining as stipulated by DWS.	
<p>STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p>Waste Management:</p> <ul style="list-style-type: none"> • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily. 	<p>Waste Management:</p> <ul style="list-style-type: none"> • 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. 	<p>Responsibility:</p> <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> • 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 liter 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. <p>File proof.</p> <ul style="list-style-type: none"> • 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 recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. 	<ul style="list-style-type: none"> • 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
			<ul style="list-style-type: none"> • 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. 	
STRIPPING AND STOCKPILING OF TOPSOIL	Loss of natural vegetation Protection of fauna	Management of buffer areas: <ul style="list-style-type: none"> • Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. Protection of fauna: <ul style="list-style-type: none"> • Site management has to protect fauna that enters the processing area. 	Responsibility: <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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
STRIPPING AND STOCKPILING OF TOPSOIL	Soil erosion: <ul style="list-style-type: none"> • Loss of reinstated topsoil after rehabilitation. 	Erosion monitoring: <ul style="list-style-type: none"> • Grader to restore areas prone to soil erosion. • Planting of a cover crop to stabilize re-instated soil • Erosion prevention equipment. 	Responsibility: <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> • Control run-off water via temporary banks 	<ul style="list-style-type: none"> • 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

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			<p>to ensure that accumulation of run-off does not cause down-slope erosion.</p> <ul style="list-style-type: none"> • 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. 	<p>by an Independent Environmental Control Officer.</p>
<p>STRIPPING AND STOCKPILING OF TOPSOIL</p>	<p>Protection of Cultural and Heritage Artefacts</p>	<p>Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.</p>	<p>Responsibility:</p> <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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
			was cleared by Heritage Free state.	
EXCAVATION	Monitoring of visual impacts	<ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> • Minimize the visual impact of the activity on the surrounding environment 	<ul style="list-style-type: none"> • 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	Dust Monitoring: <ul style="list-style-type: none"> • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods. 	Dust Handling and Monitoring: <ul style="list-style-type: none"> • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. 	Responsibility: <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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	Noise Monitoring <ul style="list-style-type: none"> • The noise impact 	Noise Handling and Monitoring:	Responsibility: <ul style="list-style-type: none"> • Site Manager to ensure compliance with 	<ul style="list-style-type: none"> • Throughout Construction, Operational and Decommissioning Phase

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	<p>should be contained within the boundaries of the property, as it will represent the current activities.</p>	<ul style="list-style-type: none"> 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. 	<p>the guidelines as stipulated in the EMPR.</p> <ul style="list-style-type: none"> Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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	Health and safety risk	<p>Health and safety Management:</p>	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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
EXCAVATION	<p>Loss of natural vegetation Protection of fauna</p>	<p>Management of buffer areas:</p> <ul style="list-style-type: none"> Site management has to ensure the use of visible beacons to demarcate the boundaries of the approved area. <p>Protection of fauna:</p> <ul style="list-style-type: none"> Site management has to protect fauna that enters the 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> Contain all activities within the boundaries of the approved processing area. Demarcate, signpost and manage the 20 	<ul style="list-style-type: none"> 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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		processing area.	<p>m buffer area as no-go area around areas with natural vegetation.</p> <ul style="list-style-type: none"> • 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. 	
EXCAVATION	<p>Waste Management:</p> <ul style="list-style-type: none"> • Management of waste must be a daily monitoring activity. • Hydrocarbon spills need to be cleaned immediately and the site manager must check compliance daily. 	<p>Waste Management:</p> <ul style="list-style-type: none"> • 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. 	<p>Responsibility:</p> <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> • 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 liter 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. <p>File proof.</p> <ul style="list-style-type: none"> • Ensure the availability of suitable covered receptacles at all times and conveniently placed for the disposal of waste. • Store non-biodegradable refuse such as 	<ul style="list-style-type: none"> • 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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			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 recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. <ul style="list-style-type: none"> • 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. 	
EXCAVATION	Management of weed or invader plants <ul style="list-style-type: none"> • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed. 	Management of weed or invader plants: <ul style="list-style-type: none"> • Removal of weeds must be manually or by the use of an approved herbicide. 	Responsibility: <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer
EXCAVATION	Protection of Cultural and Heritage Artefacts	Should any artefacts be discovered the area needs to be demarcated and work needs to be stopped.	Responsibility: <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> • Immediately stop work should any 	<ul style="list-style-type: none"> • 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

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			evidence of human burials or other heritage artefact be discovered during the execution of the activities. <ul style="list-style-type: none"> • Notify Heritage Free state and the ECO immediately. • Work may only commence once the area was cleared by Heritage Free state. 	by an Independent Environmental Control Officer.
TRANSPORTATION OF SAND AND AGGREGATES FROM STOCKPILE AREA TO CLIENTS	Dust Monitoring: <ul style="list-style-type: none"> • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods. 	Dust Handling and Monitoring: <ul style="list-style-type: none"> • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. 	Responsibility: <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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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	<p>Management of Access Roads</p> <ul style="list-style-type: none"> The condition of the access road must be continuously monitored. 	<p>Management of Access Roads:</p> <ul style="list-style-type: none"> Dust suppression equipment such as a water car and dispenser. Grader to restore the road surface when needed. 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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
	<p>Noise Monitoring</p> <ul style="list-style-type: none"> The noise impact should be contained within the boundaries of the property, as it will represent the current activities. 	<p>Noise Handling and Monitoring:</p> <ul style="list-style-type: none"> 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. 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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.
	<p>Waste Management:</p> <ul style="list-style-type: none"> Management of waste must be a daily monitoring activity. Hydrocarbon spills need to be cleaned immediately and the 	<p>Waste Management:</p> <ul style="list-style-type: none"> Closed containers for the storage of general of hazardous waste until waste is removed to the appropriate landfill site. A hydrocarbon spill kit to 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p>	<ul style="list-style-type: none"> 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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	<p>site manager must check compliance daily.</p>	<p>enable sufficient clean-up of contaminated areas.</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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 liter 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 recognized landfill site at Robertson. 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. 	<ul style="list-style-type: none"> • 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
<p>SCREENING OF SAND AND AGGREGATES</p>	<p>Dust Monitoring: • The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods.</p>	<p>Dust Handling and Monitoring: • Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available.</p>	<p>Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer.</p> <p>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.</p>	<ul style="list-style-type: none"> • 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
	<p>Noise Monitoring • The noise impact should be contained within the boundaries of the property, as it will represent the current activities.</p>	<p>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.</p>	<p>Responsibility: • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer.</p> <p>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.</p>	<ul style="list-style-type: none"> • 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
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Topsoil management	<p>Topsoil Handling:</p> <ul style="list-style-type: none"> 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 from overburden. 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> 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
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	<p>Dust Monitoring:</p> <ul style="list-style-type: none"> The dust generated by the processing activities must be continuously monitored, and addressed by the implementation of dust suppression methods. 	<p>Dust Handling and Monitoring:</p> <ul style="list-style-type: none"> Dust suppression equipment such as a water car and water dispenser. The applicant already has this equipment available. 	<p>Responsibility:</p> <ul style="list-style-type: none"> Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> Control the liberation of dust into the surrounding environment by the use of; inter alia, water spraying and/or other dust-allaying agents. 	<ul style="list-style-type: none"> 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

NAME OF ACTIVITY	IMPACTS REQUIREING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			<ul style="list-style-type: none"> • 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. 	
<p>SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)</p>	<p>Health and safety risk</p>	<p>• Health and safety Management:</p>	<p>Responsibility:</p> <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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
<p>SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)</p>	<p>Noise Monitoring</p> <ul style="list-style-type: none"> • The noise impact should be contained within the boundaries of the property, as it will represent the current activities. 	<p>• Stocked first aid box.</p>	<p>Responsibility:</p> <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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
			road worthy condition in terms of the Road Transport Act.	
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.	• Level 1 certified first aider	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 liter 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	• 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
			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 recognized landfill site at Robertson. Prevent refuse from being dumped on or near the processing area. <ul style="list-style-type: none"> • 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. 	
SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)	Topsoil management	<ul style="list-style-type: none"> • All appointments in terms of the Mine Health and Safety Act. 	Responsibility: <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. Role: <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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 REQUIREING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			<ul style="list-style-type: none"> • Conduct the activity in accordance with the Best Practice Guideline for small-scale mining as stipulated by DWS. 	
<p>SLOPING, LANDSCAPING AND REPLACEMENT OF TOPSOIL OVER DISTURBED AREA (FINAL REHABILITATION)</p>	<p>Management of weed or invader plants</p> <ul style="list-style-type: none"> • The presence of weed and/or invader plants must be continuously monitored, and any unwanted plants must be removed. 	<p>Management of weed or invader plants:</p> <ul style="list-style-type: none"> • Removal of weeds must be manually or by the use of an approved herbicide. 	<p>Responsibility:</p> <ul style="list-style-type: none"> • Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the Environmental Control Officer. <p>Role:</p> <ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Throughout Operational and Decommissioning Phase • Daily compliance monitoring by site management. • Quarterly compliance monitoring of site by an Environmental Control Officer

(l) Indicate the frequency of the submission of the performance assessment/environmental audit report.

The Mineral and Petroleum Resources Development Regulations stipulates that performance assessment reporting should 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.

Once mining of the proposed area starts a copy of the Basic Assessment Report and Environmental Management Programme report will be handed to the site manager during the site establishment meeting. Issues such as topsoil handling, site clearance, fire principals and hazardous waste handling will be discussed. An induction meeting will be held with all the site workers to inform them of the Basic Rules of Conduct with regard to the environment.

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.

Training will also address the specific measures and actions as listed in the EMPR. This Environmental Awareness Plan (EAP) is intended to supplement the Safety, Health and Environmental (SHE) training and awareness requirements.

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 19 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.

Table 19: 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		
		Emergency preparedness and response	Meetings and Talk Topics	Continuous
		Knowledge in spill management, stockpile management, discard management, water management and waste management		
		Knowledge of the relevant Operational procedures, Emergency Response Plans and Incident reporting		
		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	Implementation and	Understanding the purpose of the SEAMS and SHE Management	General in-house, management	Once off

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
Section Engineers	daily management of the SEAMS and the SHE Management System	System	training	Continuous
		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	
		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		
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	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 and handling of chemicals		
		Understanding the requirements for not polluting the environment		

OCCUPATION CATEGORY	ENVIRONMENTAL MANAGEMENT RESPONSIBILITY / ROLE	REQUIRED KNOWLEDGE AND INPUT	TRAINING REQUIRED	INTERVAL
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 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
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 risk 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 mining takes place. An Environmental Control Officer needs to check compliance of the mining activity 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 box. 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, Parys 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.

Police Department:	10111
Ambulance:	018 610 8691
Hospital:	056 816 2100
DWS:	056 811 5834

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).

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 0.8m 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;
- Don't 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:

- If any spills take place the contaminant together with the soil will be removed and placed in acceptable container to be removed with industrial waste to a recognised licence facility or licenced company.
- Bioremediation will be done on site to the satisfaction of DEAT
- A spill clean-up kit is available at the storage yard
- All personnel will be trained in spill clean-up methodologies.
- 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;
- If the spill is larger than 100litres the Department of Environmental Affairs and Tourism (DEAT) will be notified by fax and or phone within 24hours of the event.
- 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 points where diesel, oil or any hydraulic fluid can drip 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 removed 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 loud noises; and
- Report or repair noisy vehicles.

Flora and Fauna

- 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 Protection 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;
- Fire breaks has been established and will be maintained around the mining area for the duration of the project;
- 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.

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; and
- 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 shortcomings and non-compliance 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 X
- b) the inclusion of comments and inputs from stakeholders and I&AP's X
- c) the inclusion of inputs and recommendations from the specialist reports where relevant, and X
- d) that the information provided by the EAP to interested and affected parties and any response by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein

X



Signature of the environmental assessment practitioner:

Greenmined Environmental

Name of Company:

21 May 2018

Date:

-END-

APPENDIX LIST

Appendix A	Main Application Map
Appendix A1	1:250 000 Map
Appendix B	Mine Activities Map
Appendix C	Surrounding Land Use Map
Appendix D	Rehabilitation Plan
Appendix E	Comments and Response Report
Appendix E1	Proof of Consultation
Appendix F	Supporting Impact Assessment
Appendix G	Photographs of the site
Appendix H	Specialist Studies
Appendix I1	Heritage Impact Assessment
Appendix I2	Cumulative Land Impact Assessment
Appendix I	CV and Experience Record of EAP
Appendix J	Social and Labour Plan
Appendix K	Alien Invasive Management Plan
Appendix L	Zoning Letter from Attorneys

