PROPOSED GRAVEL MINE ON THE REMAINING EXTENT OF THE FARM SYDENHAM 445, REGISTRATION DIVISION OF BLOEMFONTEIN, FREE STATE PROVINCE

DRAFT BASIC ASSESSMENT REPORT

SEPTEMBER 2020

REFERENCE NUMBER: *FS 30/5/1/3/2/10320 MP*

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EXECUTIVE SUMMARY

Kenrau (Pty) Ltd, applied for environmental authorisation (EA) and a mining permit to mine gravel from a section of the farm that was previously used as an existing quarry on a portion of the Remaining Extent of the farm Sydenham 445, Registration Division of Bloemfontein, Free State province. The proposed mining site will be an extension of the existing quarry pit previously mined for gravel. The mining method will make use of excavation by means of earth moving equipment. The material is then loaded and hauled to a crushing and screening plant. The gravel will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site.

The proposed mining area is approximately 5 ha in extent and the applicant, intents to win material from the area for at least 2 years with a possible extension of another 3 years. The gravel to be removed from the quarry will be used for the construction industry in the vicinity. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure and building contracts in and around the Bloemfontein area.

The proposed project triggers listed activities in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and the Environmental Impact Assessment Regulations 2014 (as amended 2017) and therefore requires an environmental impact assessment (basic assessment process) that assess project specific environmental impacts and alternatives, consider public input, and propose mitigation measures, to ultimately culminate in an environmental management programme that informs the competent authority (Department of Mineral Resources and Energy) when considering the environmental authorisation. This report, the Draft Basic Assessment Report, forms part of the departmental requirements, and presents the first report of the EIA process.

Site Alternative 1 (Preferred and Only Site Alternative):

Site Alternative 1, which entails the mining of an area previously used for the mining of gravel from and existing quarry, was identified during the assessment phase of the environmental impact assessment, by the Applicant and project team, as the preferred site alternative.

No-go Alternative:

The no-go alternative entails no change to the *status quo* and is therefore a real alternative that needs to be considered. The gravel to be mined from the existing quarry will be sold to the building, road rehabilitation/maintenance and associated construction industry, if however, the no-go alternative is implemented the Applicant could not utilise the mineral resource on this property and

the construction industry of Bloemfontein will not benefit from diversification of gravel sources which will escalating product costs.

Public Participation Process:

During the initial public participation process the stakeholders and I&AP's were informed of the project by means of background information documents that were sent directly to the contact persons. An advertisement that was placed in the Bloemfontein Courant, and two on-site notices were placed at conspicuous places. Interested and Affected Parties (I&AP's) were invited to attend the public meeting on the 10th of September 2020, but no I&AP's registered for the public meeting. A 30-days commenting period was allowed which expired on 29 September 2020. Thus far, only UFS registered on the project; no other comments or objections have been received. In accordance with the timeframes stipulated in the EIA Regulations, 2014 (as amended by GNR 326 effective 7 April 2017) the Draft Basic Assessment Report was compiled and will be distributed for comment and perusal to the I&AP's and stakeholders. A 30-day commenting period, ending 19 November 2020, will be allowed for perusal of the documentation and submission of comments. The comments received on the DBAR will be incorporated into the Final Basic Assessment Report (FBAR) to be submitted for decision making to DMRE.

Basic Assessment Report:

The basic assessment report identifies the potential positive and negative impacts that the proposed activity will have on the environment and the community as well as the aspects that may impact on the socio-economic conditions of directly affected persons, and proposes possible mitigation measure that could be applied to modify / remedy / control / stop the identified impacts.

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

Topography:

- The natural topography the proposed excavated area can be described as slightly undulating bottomland landscape covered with tall, dense grassland alternating with patches of karroid scrub occurring especially over calcrete.

Visual Characteristics:

- The viewshed analysis showed that the visual impact of the proposed gravel mining operation will be of low significance. The small scale of the proposed operation, and the mining within an existing excavation area contributes to the low visual significance. Should the Applicant successfully

rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine

Air and Noise Quality:

- The proposed activity will contribute the emissions mechanical mining equipment to the receiving environment for the duration of the operational phase. Should the permit holder implement the mitigation measures proposed in this document and the EMPR the impact on the air quality of the surrounding environment is deemed to be of low significance and compatible with the current land use. The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the traffic of the surrounding area.

Geology and Soil:

- The material to be mined is already in aggregate form, only excavation equipment is needed. Sedimentary mudstones and layers of sandstone mainly of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup). Volksrust Formation mudstones of the Ecca Group (also Karoo Supergroup) dominate the western part of the area. Deep (>300 mm) layer of red sand (aeolian origin) covers the more clayey B-horizons. Soil forms such as arable Hutton, Bainsvlei and Bloemdal occur here and are typical of the Ca land type. The Ea land type has shallow gravelly soils underlain by dolerite sills. Ca and Ae land types are nearly equally represented.

Hydrology:

- The proposed project does not require a Water Use Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998). As mentioned earlier, the proposed mining footprint extends into an area that has previously been used for mining, and no activity will take place in or within 1km radius of any water bodies. Any water required for the implementation of the project will be bought from a registered source and transported to on site.

Mining, Biodiversity and Groundcover:

- Ground-truthing showed that the proposed footprint of the mining area is highly disturbed. The Applicant will make use of the existing access point to the mining area. Should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the vegetation and groundcover in general is deemed to be of low significance.

Fauna:

- Various small mammals and reptiles occur on the property. Larger herbivore species are very scares or absent due to the conflicting land use. 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 will be informed and managed to ensure that no fauna at the site is harmed. No

poaching or hunting of animals will be allowed. All construction vehicles must adhere to a low speed limit (<40km/h) to avoid collisions with susceptible species such as snakes and tortoises. Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.

Cultural and Heritage Environment:

- No sites of archaeological or cultural importance were identified during the site inspection, and consultation with the interested and affected parties also did not identify any potential area of concern. The Applicant will implement a chance-find protocol on site for the duration of the site establishment, operational- and decommissioning phase.

Site Specific Infrastructure:

- The existing infrastructure within 500 m of the proposed mining area includes a connecting road of the N6, the N1 a water reservoir and infrastructure of the flying club. None of the existing infrastructure falls within the site area and will therefore not be affected.

During the environmental impact assessment process the feasibility of the proposed site was assessed to identify fatal flaws that are deemed as severe as to prevent the activity continuing, or warrant a site or project alternative. The outcome of the assessment showed that should the mitigation measures and monitoring programmes proposed in this document be implemented, no fatal flaws could be identified that prevents the activity continuing.

Environmental Management Programme (EMPR)

The EMPR provides a description of the impact management outcomes and closure objectives. It presents the impacts to be mitigated in their respective phases as well as stipulates the mitigation measures to be applied on site.

The financial provision 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 405 245.68.

LIST OF ABBREVIATIONS

BID	Background Information Document
BGIS	Biodiversity GIS
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
DBAR	Draft Basic Assessment Report
DEDEAT	Department of Economic Development, Environmental Affairs and Tourism
DMRE	Department of Mineral and Resources and Energy
DoT	Department of Transport
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIA Regulations	Environmental Impact Assessment Regulations, 2014 (as amended 2017)
EISC	Ecological Importance and Sensitivity Category
EMPR	Environmental Management Programme
FBAR	Final Basic Assessment Report
FEL	Front-end-loader
FSBP	Free State Biodiversity Plan
GDP	Gross Domestic Product
GNR	Government Notice
I&AP's	Interested and Affected Parties
MHSA	Mine Health and Safety Act, 1996 (Act No. 29 of 1996)
MMM	Mangaung Metropolitan Municipality
MP	Mining Permit
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Control Act, 2004 (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEM:WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act, 1999 (Act No 25 of 1999)

NRTA	National Road Traffic Act, 1996 (Act No. 93 of 1996)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PCB's	Polychlorinated Biphenyl
PCO	Pest Control Officer
PES	Present Ecological State
PPE	Personal Protective Equipment
PSM	Palaeontological Sensitivity Map
RA	Risk Assessment
REC	Recommended Ecological Category
S1	Site Alternative 1
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAMBF	South African Mining and Biodiversity Forum
USBM	US Bureau of Mines
WMA	Water Management Area
WULA	Water Use Licence Application

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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:	Kenrau (Pty) Ltd
TEL NO:	Tel: 051 4355771
FAX NO:	N/A
POSTAL ADDRESS:	N/A
PHYSICAL ADDRESS:	Kenrau (Pty) Ltd 1st Floor, Ellen Gabarone Building, c/o George Lubbe & Moshoeshoe Rd Rocklands, Bloemfontein, Free State 9301
FILE REFERENCE NUMBER SAMRAD:	FS 30/5/1/3/2/10320 MP

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.

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

1. CONTACT PERSON AND CORRESPONDENCE ADDRESS

a) Details of: Greenmined Environmental

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) the proponent must appoint an independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) of any activities regulated in terms of the aforementioned Act. Kenrau (Pty) Ltd appointed Greenmined Environmental to undertake the study needed. Greenmined Environmental has no vested interest in Kenrau (Pty) Ltd or the proposed project and declares its independence as required by the Environmental Impact Assessment Regulations, 2014 (as amended April 2017) (EIA Regulations).

i) Details of the EAP

Name of the Practitioner:	Mrs Sonette Smit (Senior Environmental Specialist)
Tel No.:	021 851 2673
Fax No.:	086 546 0579
E-mail address:	sonette.s@greenmined.co.za

ii) Expertise of the EAP.

(1) The qualifications of the EAP
(with evidence).

Mrs. S Smit has fourteen years of experience in environmental legal compliance audits, (GIS) geographic information system, mining right and permit applications and applications for environmental authorisations & Water use applications.. Please find full CV attached in Appendix K.

(2) Summary of the EAP's past experience.
(In carrying out the Environmental Impact Assessment Procedure)

Sonette Smit is an Environmental Consultant with 14 years' experience in the environmental sector. She specialized the last 8 years in the mining sector where she conducted the mining related report and programs. She has also been involved in a number of other environmental and water use application projects where she compiled environmental management plans, environmental impact assessments, environmental audits, IWULA's/IWWMP's.

b) Location of the overall Activity.

Table 1: Location of the proposed project.

Farm Name:	The Remaining Extent of the farm Sydenham 445, Registration Division of Bloemfontein, Free State province
Application area (Ha)	5.0 ha
Magisterial district:	Bloemfontein
Distance and direction from the nearest town	±10 km south of Bloemfontein of the N1 Travelling south on the N1 take the left turn of on the N6 towards Aliwal North, the site is located just off the N6 on Church street
21 digit Surveyor General Code for each farm portion	F00300000000044500000

c) Locality map

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

The requested map is attached as Appendix B.

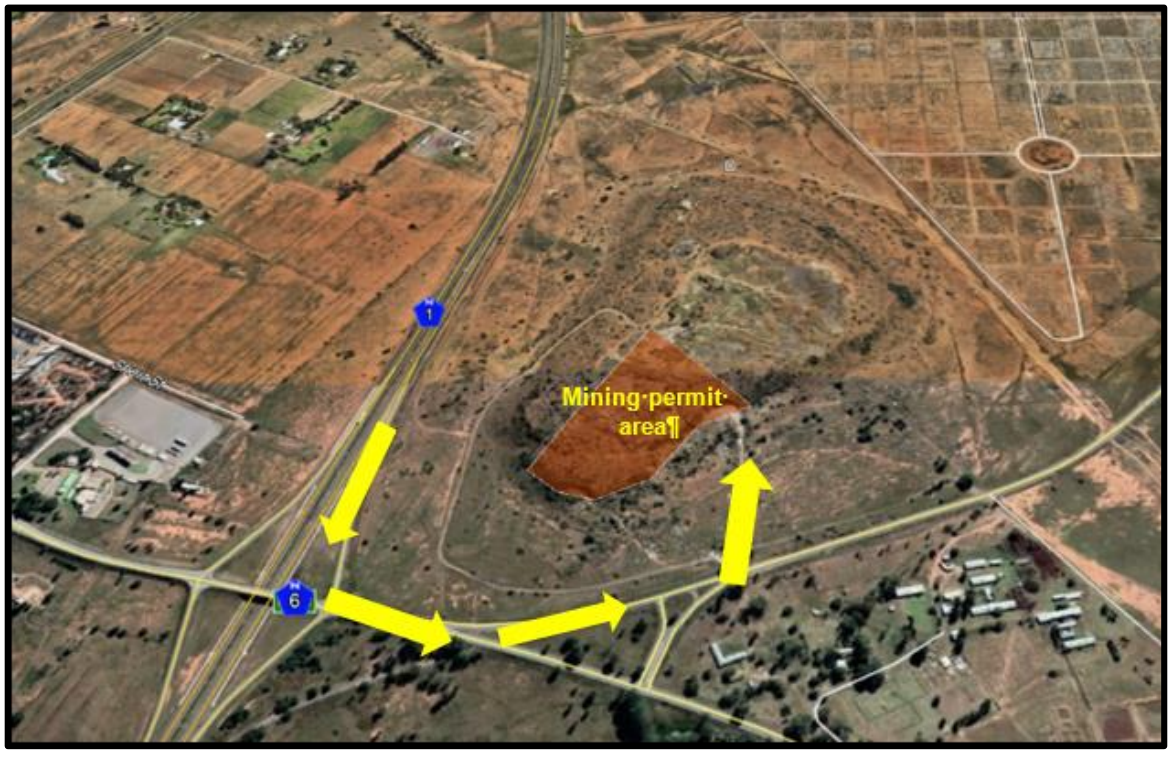


Figure 1: Satellite view of the proposed mining permit area (brown polygon) of Kenrau (Pty) Ltd (image obtained from Google Earth).

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

Kenrau (Pty) Ltd (hereinafter referred to as "the Applicant"), applied for environmental authorisation (EA) and a mining permit to mine gravel from and existing quarry on a portion of the Remaining Extent of the farm Sydenham 445, Registration Division of Bloemfontein, Free State province.

The proposed mining site will be an extension of the existing quarry pit previously mined for gravel. The mining method will make use of excavation by means of earth moving equipment. The material is then loaded and hauled to a crushing and screening plant. The gravel will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site.

The proposed mining area is approximately 5 ha in extent and the applicant, intents to win material from the area for at least 2 years with a possible extension of another 3 years. The gravel to be removed from the quarry will be used for construction industry in the vicinity. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure and building contracts in and around the Bloemfontein area.

The mining activities will consist out of the following:

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

The mining site will contain the following:

- Excavating equipment;
- Earth moving equipment;
- Mobile crushing and screening plants;
- Site office (Container);
- Site vehicles;
- Parking area for visitors and site vehicles;

- Weighbridge;
- Ablution facilities (Chemical toilet).

See attached as Appendix C a copy of the site activities map for the proposed project.

i) Listed and specified activities

Table 2: Listed and specified activities triggered by the associated mining activities

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc E.g. for mining – excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity** Ha or m^2	**LISTED ACTIVITY** Mark with an X where applicable or affected	**APPLICABLE LISTING NOTICE** (GNR 324, GNR 325, GNR 326 OR GNR 327)
Demarcation of site with visible beacons.	5.0 ha	N/A	Not listed
Site establishment	±5 ha	X	GNR 327 LN 1 Activity 27
• GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2014 Activity 27: *The clearance of an area of 1 hectares or more, but less than 20 hectares of* *indigenous vegetation, except where such clearance of indigenous vegetation is* *required for—* *(i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.*			
Mining of gravel	±5 ha	X	GNR 327 LN 1 Activity 21, 28.
• GNR Environmental Impact Assessment Regulations 327 Listing Notice 1 of 2017 Activity 21: *Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including —* *(a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource [,]; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]* *(b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;* • *but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining,*			

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc E.g. for mining – excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity** Ha or m^2	**LISTED ACTIVITY** Mark with an X where applicable or affected	**APPLICABLE LISTING NOTICE** (GNR 324, GNR 325, GNR 326 OR GNR 327)
calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies • GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2014 Activity 28: *Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development:* *(i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or* *(ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;* *excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.*			
Crushing, screening, stockpiling and transporting material from site.	±1 ha	X	GNR 327 LN 1 Activity 21, 28.
• GNR Environmental Impact Assessment Regulations 327 Listing Notice 1 of 2017 Activity 21: *Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including —* *(a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource [,]; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]* *(b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;* *but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies* • GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2014 Activity 28: *Residential, mixed, retail, commercial, industrial or institutional developments where*			

NAME OF ACTIVITY (E.g. For prospecting – drill site, site camp, ablution facilities, accommodation, equipment storage, sample storage, site office, access route etc... etc... etc E.g. for mining – excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	**Aerial extent of the activity** Ha or m^2	**LISTED ACTIVITY** Mark with an X where applicable or affected	**APPLICABLE LISTING NOTICE** (GNR 324, GNR 325, GNR 326 OR GNR 327)
such land was used for agriculture, game farming, equestrian purposes or afforestation *on or after 01 April 1998 and where such development:* *(i) will occur inside an urban area, where the total land to be developed is bigger* *than 5 hectares; or* *(ii) will occur outside an urban area, where the total land to be developed is bigger* *than 1 hectare;* *excluding where such land has already been developed for residential, mixed, retail,* *commercial, industrial or institutional purposes.*			
Sloping and landscaping upon closure of the mining area.	5.0 ha	X	GNR 327 LN 1 Activity 22.
▪ GNR 327 Environmental Impact Assessment Regulations Listing Notice 1 of 2017 Activity 22: *The decommissioning of any activity requiring a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002.*			

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 Remaining Extent of the farm Sydenham 445, Registration Division of Bloemfontein RD, Free State province is situated approximately ±10 km south of Bloemfontein. The area earmarked for the proposed mining falls on a section of the farm that was previously used as an existing quarry and the intention of this application is to increase the existing quarry. The GPS coordinates of the proposed mining area are as follows:

Table 3: GPS Coordinates of the proposed mining footprint.

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	29°11'48.368"	26°11'45.366"	-29.196769º	26.195935º
B	29°11'53.387"	26°11'51.245"	-29.198163º	26.197568º
C	29°11'54.848"	26°11'48.39"	-29.198569º	26.196775º
D	29°11'57.98"	26°11'46.086"	-29.199439º	26.196135º
E	29°11'59.219"	26°11'43.3"	-29.199783º	26.195361º
F	29°11'58.744"	26°11'41.244"	-29.1996517º	26.19479º
G	29°11'57.505"	26°11'39.57"	-29.199303º	26.194356º

Project Proposal:

The proposed mining site will be an extension of the existing quarry pit previously mined for gravel. The mining method will make use of excavation by means of earth moving equipment. The material is then loaded and hauled to a crushing and screening plant. The gravel will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site.

The proposed mining area is approximately 5 ha is extent and the applicant, intents to win material from the area for at least 2 years with a possible extension of another 3 years. The gravel to be removed from the quarry will be used for construction industry in the vicinity. The proposed quarry will therefore contribute to the upgrading / maintenance of road infrastructure and building contracts in and around the Bloemfontein area.

The mining activities will consist out of the following:

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

The proposed mining activities will entail the following:

- The existing access road to the mining area will be used.
- The proposed mining site will be an extension of the existing quarry pit previously mined for gravel.

- The mining method will make use of excavation by means of earth moving equipment. The material is then loaded and hauled to a crushing and screening plant. The gravel will be stockpiled and transported to clients via trucks and trailers.
- All activities will be contained within the boundaries of the site.

Should the MP be issued and the mining of gravel be allowed, the proposed project will comprise of activities that can be divided into three key phases (discussed in more detail below) namely the:

(1) *Site establishment phase* which will involve the demarcation of the permitted mining area. Site establishment may necessitate the clearing of vegetation (that established through succession) from the mining area, the stripping and stockpiling of topsoil at the mining area (if applicable), and the introduction of the mining machinery and equipment.

(2) *Operational phase* that will entail the removal of the gravel with an excavator from the approved footprint area, crushing and screening (if needed) of the gravel, stockpiling and hauling of the material to clients.

(3) Decommissioning phase which entails the rehabilitation of the affected environment prior to the submission of a closure application to the Department of Mineral Resources and Energy (DMRE).

- Rehabilitation of the surface area shall entail landscaping, levelling, top dressing, land preparation, seeding (if required), and weed / alien clearing.

- All infrastructures, equipment, and other items used during the mining period will be removed from the site (section 44 of the MPRDA).

- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognised 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 categorised as weeds according to the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) [NEMBA] 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. Once the mining area was rehabilitated, the mining permit holder will submit a closure application to the DMRE in accordance with section 43(4) of the MPRDA, 2002. The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

PHASES OF THE PROJECT

1. *Site Establishment Phase:*

Site establishment entails the demarcation of the mining boundaries, clearance of vegetation and stripping and stockpiling of topsoil (if needed) from the mining area, and the introduction of the mining equipment as detailed below:

- **Demarcation of Mining Boundaries:**

  Pursuant to receipt of an Environmental Authorisation (EA) and Mining Permit (MP), and prior to site establishment, the boundaries of the mining area will be demarcated with visible beacons.

- **Clearing of Vegetation:**

  According to Mucina and Rutherford (2012) the vegetation type of the natural areas is known as the Bloemfontein Dry Grassland (GH5). As mentioned earlier, the footprint of the proposed mining area was chosen to extend over an area that was previously used for the same purpose, but small areas of indigenous vegetation still need to be disturbed to allow the establishment of the site. To mitigate this, the clearing of vegetation must be contained to the approved mining footprint, and no vegetation/bush clearance, outside the approved area, may be allowed.

- **Topsoil Stripping:**

  Should the permit holder need to use an area where topsoil has not previously been removed, the complete A-horizon will be stripped and stockpiled to be replaced during the rehabilitation of the area. If it is unclear where the topsoil layer ends the top 300 mm of soil will be stripped. It will be part of the obligations of site management to prevent the mixing of topsoil heaps with overburden/other soil heaps. The topsoil berm will measure a maximum of 1.5m in height in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.

- **Access Road:**

  The Applicant will use the existing gravel farm road, (±300m) to access the mining area and transport material from the mine. The farm road has a formal entrance onto a Church street just of the N6, and was also used by the previous permit holder to transport gravel from and existing quarry. No upgrading of the road is needed prior to commencement. The surface of the farm road will be maintained by the permit holder for the duration of the operational phase.

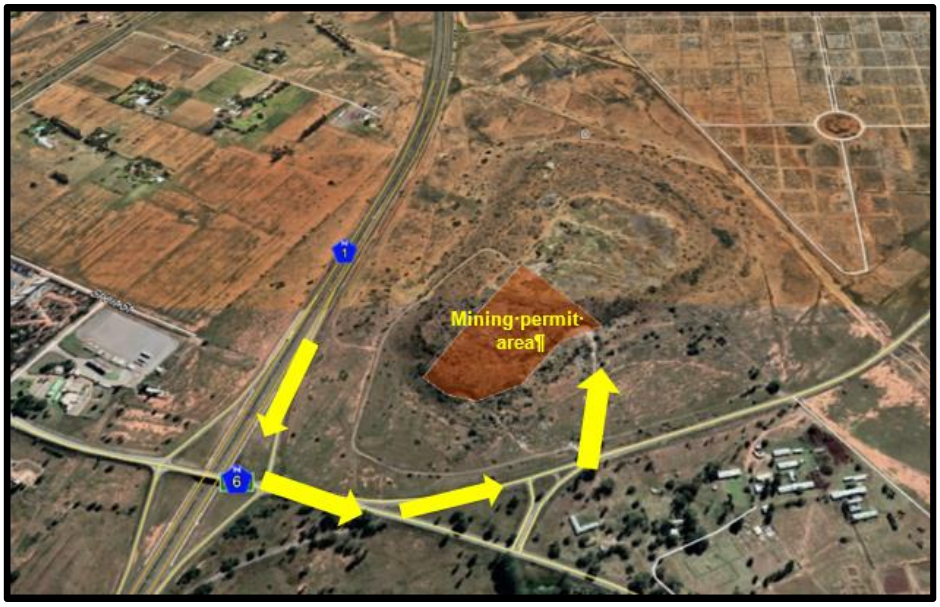


Figure 2: Satellite view showing the access road (yellow arrows) to the proposed mining area (brown polygon).

Figure 3: Photos showing the existing entrance into the mining area.

- **Introduction of Mining Machinery:**

  The mining site will contain the following:

  - Excavating equipment;
  - Earth moving equipment;
  - Mobile crushing and screening plants;
  - Site office (Container);
  - Site vehicles;

- Parking area for visitors and site vehicles;
- Weighbridge;
- Ablution facilities (Chemical toilet).

2. *Operational Phase:*

The operational phase will involve the recovery of the gravel by means of earth moving equipment. The material is then loaded and hauled to a crushing and screening plant. The gravel will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site. The mining activities will consist out of the following:

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

- <u>Water Use:</u>

  As no gravel washing is proposed for this project, the Applicant will exclusively use water for dust suppression purposes on the access road and processing plant when needed. Approximately 5 - 10 000 litre water/day will be needed during the dry months.

  Dust generated on the access road will, as far as possible, be managed through alternative dust suppression methods to restrict water use to the absolute minimum.

  These measures will include a combination of the following:
  - The speed of all mining equipment/vehicles will be restricted to 40 km/h on the internal farm road to minimize dust generation;
  - When the truck leaves the mining area it will be covered to minimise windblown dust from the loads;
  - The Applicant will attempt to lessen denuded areas (dust source) to the absolute minimum.

  Under very windy/dusty conditions the permit holder might have to substitute the above mentioned dust suppression methods with the spraying of water,

in which case water will be bought and transported to the mining area in a water truck that will moisten the problem area. The water truck driver will receive proper training to ensure effective use of the water on problem areas preventing water wastage.

- Electricity:

The proposed project will make use of generators for power supply until a connection to the national grid can be secured.

- Waste Handling:

Due to the nature of the project, the small scale of the proposed operation, and the fact that no permanent infrastructure will be established, very little to no general waste will be generated as a direct result of the mining activities. Any waste generated during the operational phase, will be contained in a sealable refuse bin that will be removed from site and incorporated in the existing waste disposal system at the workshop of the Applicant.

Likewise, very little (if any) generation of hazardous waste is expected. Hazardous waste will mainly be the result of accidental spillages or breakdowns. Such contaminated areas will be cleaned up immediately (within two hours of the occurrence) and contaminated soil will be contained in designated hazardous waste containers to be removed daily to the hazardous waste storage area at the Applicant's off-site workshop where it will be disposed of as part of the hazardous waste by a registered hazardous waste handling contractor.

The chemical toilet, to be placed on site, will be serviced by a registered contractor.

- Servicing and Maintenance:

Regular vehicle maintenance, repairs and services may only take place in a demarcated service area of the permit holder. If emergency repairs are needed on equipment not able to move to the workshop / service area, 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 workshop in order to ensure proper disposal.

Decommissioning Phase:

The decommissioning phase will entail the reinstatement of the proposed mining footprint (5.0 ha).

The end objective is for the mining area to return to dormant agricultural use. No buildings/infrastructure, need to be demolished and the access road will remain intact.

The decommissioning activities will consist of the following:

- Removal of all mining machinery from the mining area;
- Removal of the crushing and screening plant, containers, weighbridge and chemical toilet from the mining area;
- Removal/levelling of all stockpiled material;
- Landscaping the mining area, and replacing the topsoil (if previously removed);
- Vegetating the reinstated area; and
- Controlling the invasive plant species.

The applicant will comply with the minimum closure objectives as prescribed DMRE and detailed below:

- Rehabilitation of the Excavated Area:

  The excavated area must serve as a final depositing area for the placement of overburden. Rocks and coarse material removed from the excavation must be dumped into the excavation.

  No waste may be permitted to be deposited in the excavations.

  Once overburden, rocks and coarse natural materials has been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.

  The area must be fertilized if necessary 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, should natural vegetation not re-establish within 6 months from closure of the site.

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 the Mining area:

  The mining equipment, crushing and screening plant, containers, weighbridge, chemical toilet and stockpiled material will be removed from the mining area. Compacted areas will be ripped and landscaped and previously stockpiled topsoil will be reinstated. The reinstated area will be seeded with a locally adapted grassmix, and invasive plant species will be controlled for at least one growth seasons. The reinstated area will be monitored for signs of erosion until the cover crop established.

- Final Rehabilitation:

  Final rehabilitation of the surface area shall entail landscaping, levelling, maintenance, and clearing of invasive plant species. All equipment, plant and other items used during the mining period will be removed from site (section 44 of the MPRDA, 2002). Waste material of any description 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. The management of invasive plant species will be done in a sporadic manner during the life of the mining activities. Species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto) will be eradicated from the site. Final rehabilitation shall be completed within a period specified by the Regional Manager.

Once the mining area was rehabilitated the permit holder is required to submit a closure application to the Department of Mineral Resources and Energy in accordance with section 43(4) of the MPRDA, 2002 that states: *"An application for a closure certificate must be made to the Regional Manager in whose region the land in question is situated within 180 days of the occurrence of the lapsing, abandonment, cancellation, cessation, relinquishment or completion contemplated in subsection (3) and must be accompanied by the prescribed environmental risk*

report". The Closure Application will be submitted in terms of Regulation 62 of the MPRDA, 2002, and Government Notice 940 of NEMA, 1998 (as amended).

e) Policy and Legislative Context

Table 4: Policy and Legislative Context.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.** (E.g. in terms of the National Water Act a Water Use License has/has not been applied for)
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity: *Physical Environment – Geology and Soil.* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of invader plant species*.	The mitigation measures proposed for the site includes specifications of the CARA, 1983.
Mine Health and Safety Act, 1996 (Act No 29 of 1996) read together with applicable amendments and regulations thereto including relevant OHSA regulations.	Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of Health and Safety Risks.*	The mitigation measures proposed for the site includes specifications of the MHSA, 1996
Mineral and Petroleum Resources Development Act, 2002, (Act No. 28 of 2002) read together with applicable amendments and regulations thereto. ℑ Section 27	Part A(1)(d) Description of the scope of the proposed overall activity	Application for a mining permit submitted to DMRE-FS. Ref No: FS 30/5/1/3/2/10320 MP
National Environmental Management Act,1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations, 2014 (as amended by GNR 326 effective 7 April 2017) • GNR 327 Listing Notice 1 Activity 21 • GNR 327 Listing Notice 1 Activity 22 • GNR 327 Listing Notice 1 Activity 27 • GNR 327 Listing Notice 1 Activity 28	Part A(1)(d)(i) Listed and specified activities.	Application for environmental authorisation submitted to DMRE-FS. Ref No: FS 30/5/1/3/2/10320 MP
National Environmental Management: Air Quality Control Act, 2004 (Act No 39 of 2004) read together with applicable amendments and regulations thereto specifically the National Dust Control Regulations, GN No R827.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Air and Noise Quality.* Part A(1)(h)(viii) The possible mitigation measures that could be	The mitigation measures proposed for the site take into account the NEM:AQA, 2004 and the National Dust Control Regulations.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**	**HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.** (E.g. in terms of the National Water Act a Water Use License has/has not been applied for)
	applied on the level of risk – *Dust Handling*.	
National Environmental Management Act: Biodiversity Act, 2004 (Act No. 10 of 2004) read together with applicable amendments and regulations thereto.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity - *Biological Environment* Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk – *Management of invader plant species*.	The mitigation measures proposed for the site includes specifications of the NEM:BA, 2004.
National Environmental Management: Waste Act, 2008 (Act No 59 of 2008) read together with applicable amendments and regulations thereto. NEM:WA, 2008: National norms and standards for the storage of waste (GN 926)	Part A(1)(d)(ii) Description of the activities to be undertaken	The mitigation measures proposed for the site take into account the NEM:WA.
National Heritage Resources Act. 1999 (Act No 25 of 1999).	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Human Environment*	The mitigation measures proposed for the site includes specifications of the NHRA, 1999.
National Water Act, 1998 (Act No 36 of 1998) read together with applicable amendments and regulations thereto.	Part A(1)(h)(iv)(1)(a) Type of environment affected by the proposed activity – *Hydrology*. Part A(1)(h)(viii) The possible mitigation measures that could be applied on the level of risk.	The proposed project does not require a Water Use Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998). As mentioned earlier, the proposed mining footprint extends into an area that has previously been used for mining, and no activity will take place in or within 1km radius of any water bodies. Any water required for the implementation of the project will be bought from a registered source and transported to on site. The mitigation measures proposed for the site includes specifications of the NWA, 1998.
Public Participation Guideline in terms of the NEMA EIA	Part A(1)(h)(ii) Details of the	Public participation was conducted in

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT. (E.g. in terms of the National Water Act a Water Use License has/has not been applied for)
Regulations	Public Participation Process Followed	accordance with the guidelines published in terms of the NEMA EIA Regulations

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 gravel from a permitted area. The proposed gravel mining operation will entail the removal of gravel, from and existing quarry, an area that was previously used for the same purpose with an easy and existing access to the mineral. The mining of the mineral was identified as a feasible business opportunity that will also bring about the diversification of activities on the property, extending it from dormant agricultural land to include small scale mining.

The project will contribute to the local economy, both directly and through the multiplier effect that its presence will create, as equipment and supplies are purchased locally, and wages are spent at local businesses, generating both jobs and income in the area.

Table 5: Need and desirability determination.

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
How were ecological integrity considerations taken into account?	As discussed under *Part A(1)(g)(iv)(1)(a) Type of environment affected by the proposed activity*, the proposed footprint of the mining area is already highly disturbed. The Applicant will make use of the existing access point to the mining area. Should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the vegetation and groundcover in general is deemed to be of low significance. When the mining footprint is layered over the Mining and Biodiversity Map, as shown in the figure below, it falls over and area of moderate biodiversity importance with a corresponding rating of moderate risk for mining. In light of this, the impact of the mining operation on the vegetation cover of the receiving environment is deemed to be of Low significance. Also refer to: • Part A(1)(g)(i) Details of the development footprint alternatives considered; • Part A(1)(g)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Vegetation; • Part A(1)(g)(viii) The possible mitigation measures that could be applied and the level of risk.	Desirable
How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity?		
How will this development pollute and/or degrade the biophysical environment?	As mentioned above all mining activities will take place in an existing quarry. The proposed footprint of the mining area is highly disturbed. The Applicant will make use of the existing access point to the mining area. Should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the vegetation and groundcover in general is deemed to be of low significancethereby keeping the impact on the receiving environment as low as possible.	
What waste will be generated by this	Due to the nature of the project, the small scale of the proposed operation, and the fact that no permanent infrastructure will be established, very little to no general waste will be generated as a direct result of the mining activities. Any waste	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
development?	generated during the operational phase, will be contained in a sealable refuse bin that will be removed from site and incorporated in the existing waste disposal system at the workshop of the Applicant. Likewise, very little (if any) generation of hazardous waste is expected. Hazardous waste will mainly be the result of accidental spillages or breakdowns. Such contaminated areas will be cleaned up immediately (within two hours of the occurrence) and contaminated soil will be contained in designated hazardous waste containers to be removed daily to the hazardous waste storage area at the Applicant's off-site workshop where it will be disposed of as part of the hazardous waste by a registered hazardous waste handling contractor. The chemical toilet, to be placed on site, will be serviced by a registered contractor. No waste is/will be disposed of or treated on site.	
How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage?	No sites of archaeological or cultural importance were identified during the site inspection, and consultation with the interested and affected parties also did not identify any potential area of concern. The Applicant will implement a chance-find protocol on site for the duration of the site establishment, operational- and decommissioning phase.	Could not be determined
How will this development use and/or impact on non-renewable natural resources?	The proposed project will make use of generators for power supply until a connection to the national grid can be secured. The water requirements mainly consist of water needed for dust suppression on the haul roads and the processing plant.	Desirable
How will this development use and/or impact on renewable natural resources and the ecosystem	Sydenham Quarry is an existing dolerite/gravel source the dolerite resource shows a potential life of mine of would still be available for many years. In light of this, it is believed that the mining permit holder could responsibly consume the dolerite	Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
of which they are part?	resource on the property over a period of 5 years.	
How were a risk-averse and cautious approach applied in terms of ecological impacts?	If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that ecological impacts should be fully mitigated.	Desirable
How will the ecological impacts resulting from this development impact on people's environmental right?	Should the mining activities be approved the potential visual-, dust-, and noise impacts associated with the proposed activity will be of low significance. If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that no environmental rights of the surrounding residents/public will be affected by the ecological impacts associated with the proposed activity.	Highly Desirable
Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts.	If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that the mining activities will not affect the physical, psychological, cultural or social needs of the community in a negative manner nor will the it impact negatively on the socio-economic status of the area	Desirable
Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?		
Considering the need to secure ecological integrity and a healthy biophysical environment,		

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
describe how the alternatives identified, resulted in the selection of the "best practicable environmental option" in terms of ecological considerations		
2. PROMOTING JUSTIFIABLE ECONOMIC AND SOCIAL DEVELOPMENT		
What is the socio-economic context of the area?		
Question	**Response**	**Level of Desirability**
What is the socio-economic context of the area?	Please refer to Heading 2(h)(iv)(1)(a) Socio-economic Environment.	Highly Desirable
Considering the socio-economic context, what will the socio-economic impacts be of the development, and specifically also on the socio-economic objectives of the area?	As mentioned earlier, should this mining permit be approved the applicant will be able to, • Provide employment opportunities; • the people/businesses of Bloemfontein will benefit from diversification of gravel sources which will result in competitive product costs. • It will also diversify the income of the property as well as potential employees and clients.	
How will this development address the specific physical, psychological, developmental, cultural	If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that the mining activities will not affect the physical, psychological, cultural or social needs of the community in a negative	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
and social needs and interests of the relevant communities?	manner nor will the it impact negatively on the socio-economic status of the area.	
Will the development result in equitable impact distribution, in the short- and long-term?	The mining activities proposes to operate in a socially and economically sustainable manner during both the short- and long term.	Highly Desirable
In terms of location, describe how the placement of the proposed development will contribute to the area.	As mentioned above all mining activities will take place in an existing quarry. The proposed footprint of the mining area is highly disturbed. The Applicant will make use of the existing access point to the mining area. Should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the surrounding area in general is deemed to be of low significancethereby keeping the impact on the receiving environment as low as possible	Highly Desirable
How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	No negative socio-economic impacts could, at this stage, be identified that cannot be managed through the implementation of mitigation measures.	Highly Desirable
How will the socio-economic impacts resulting from this development impact on people's environmental right?	As mentioned in Heading *3(j)(1) Impact on the socio-economic condition of any directly affected person*, the activity may have an impact on the visual characteristics of the surrounding environment, and may potentially affect air quality and possibly the noise ambiance of the study area. However, should the mining activities be approved the potential visual-, dust-, and noise impacts associated with the proposed activity will be of low significance. If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that no environmental rights of the surrounding residents/public will be affected by the socio-economic impacts associated with the proposed activity	Highly Desirable
Considering the linkages and dependencies between human wellbeing, livelihoods and	As mentioned above should the mining activities be approved the potential visual-, dust-, and noise impacts associated with the proposed activity will be of low significance. If the proposed mitigation measures and monitoring programs, as proposed	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts?	in this document, is implemented, it is believed that no environmental rights of the surrounding residents/public will be affected by the socio-economic impacts associated with the proposed activity.	
What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations? What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons?	Please refer to: • Part A(1)(g)(vii) The positive and negative impacts that the proposed activity and alternatives will have on the environmental and the community that may be affected.	Highly Desirable
What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by	The mining site will (if approved) operate in accordance with, amongst others, the following: • CARA, 1983 – to ensure agriculture related compliance; • Financial Provision Regulations, 2015 – to ensure compliance in terms of rehabilitation; • Mine Health and Safety Act, 1996 (as amended) – to ensure employee safety;	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
categories of persons disadvantaged by unfair discrimination? What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	• MPRDA, 2002 (as amended) – to ensure mining related compliance; • NEM:AQA, 2004 – to ensure air quality related compliance; • NEM:BA, 2004 – to ensure biodiversity related compliance; • NEM:WA, 2008 – to ensure waste related compliance; • NEMA, 1998 (as amended) – to ensure environmental related compliance;	
Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community that is consistent with the priority needs of the local area.	As mentioned earlier, should this mining permit be approved the applicant will be able to, • Provide employment opportunities; • the people/businesses of Bloemfontein will benefit from diversification of gravel sources which will result in competitive product costs. • It will also diversify the income of the property as well as potential employees and clients.	Highly Desirable
What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected	The mining activities will be in accordance with the specifications of the Mine Health and Safety Act, 1996. Site management will have daily discussions with the drill rig operators regarding the work to be performed and the environment in which the work will take place. Grievances/concerns can be lodged during the daily site meetings.	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
and protected.		
Describe how the development will impact on job creation in terms of, amongst other aspects?	As mentioned earlier, should this mining permit be approved the applicant will be able to, • Provide employment opportunities; • the people/businesses of Bloemfontein will benefit from diversification of gravel sources which will result in competitive product costs. • It will also diversify the income of the property as well as potential employees and clients.	Highly Desirable
What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage.	Should the mining permit be approved the activities will operate under a valid mining permit issued by the DMRE. Compliance of the mine with the approval conditions can be reported on as per the departmental specifications and also be managed in accordance with all the mining and environmental related legislations.	Highly Desirable
Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left.	It is believed that the mitigation measures proposed in this document is realistic and can be implemented (when needed) by the proposed activities. If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, the residual impact on the environment is of low significance.	Highly Desirable
What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health	In terms of Section 41 of the MPRDA, 2002 a mining permit holder must submit a financial provision to the DMRE that is sufficient to rehabilitate or manage the negative environmental impacts related to the mining activity.	Highly Desirable

1. SECURING ECOLOGICAL SUSTAINABLE DEVELOPMENT AND USE OF NATURAL RESOURCES		
How will this development impact on the ecological integrity of the area?		
Question	**Response**	**Level of Desirability**
effects and of preventing, controlling or minimising further pollution environmental damage or adverse health effects will be paid for by those responsible for harming the environment.		
Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified, resulted in the selection of the best practicable environmental option in terms of socio-economic considerations	Please refer to: - Part A(1)(g)(i) Details of the development footprint alternatives considered; - Part A(1)(g)(iv)(1)(c) Description of specific environmental features and infrastructure on the site – Site Specific Socio-Economic Environment; - Part A(1)(g)(vii) The positive and negative impacts that the proposed activity and alternatives will have on the environmental and the community that may be affected.	Highly Desirable
Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area.	If the proposed mitigation measures and monitoring programs, as proposed in this document, is implemented, it is believed that the mining activities will not cause a cumulative socio-economic impact should the mining permit application be approved, seeing that there is no other rated activities in the vicinity.	Highly Desirable

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

The proposed site (Site Alternative 1) was identified as the preferred and only viable site alternative based on the following:

- The proposed mining area entails the mining of gravel from an area previously used for gravel mining purposes.
- The footprint of the proposed mining area was previously disturbed by gravel mining activities, and very little natural occurring Bloemfontein Dry Grassland Vegetation needs to be disturbed.
- Access to the proposed mining area is possible via the existing farm road with a formal (existing) entrance onto a secondary road just of the N6.

The environmental impact assessment process assessed the feasibility of the proposed site alternative to identify fatal flaws that are deemed as severe as to prevent the activity continuing, or warrant another site or project alternative. The outcome of the assessment showed that should the mitigation measures and monitoring programmes proposed in this document be implemented, no fatal flaws could be identified that prevents the activity continuing. In light of the above, the mining proposal was updated to incorporate the project related mitigation measures and monitoring programmes identified during the assessment process. The preferred development footprint was subsequently finalized and is depicted on the attached site activities plan (Appendix C).

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.

Due to the application being an extension of an existing quarry, the proposed mining area, as indicated on the Regulation 2.2 Mine Plan (Appendix A), was identified as

the preferred and only viable site alternative as it entails the mining of an area previously used for gravel mining purposes.

Site Alternative 1 (S1) (Preferred and Only Site Alternative): Site Alternative 1 entails the mining of an area previously used for the mining of gravel within the GPS coordinates as listed in the table below.

Table 6: GPS Coordinates of Site Alternative 1 (preferred and only site alternative)

NUMBER	DEGREES, MINUTES, SECONDS		DECIMAL DEGREES	
	LAT (S)	LONG (E)	LAT (S)	LONG (E)
A	29°11'48.368"	26°11'45.366"	-29.196769°	26.195935°
B	29°11'53.387"	26°11'51.245"	-29.198163º	26.197568°
C	29°11'54.848"	26°11'48.39"	-29.198569°	26.196775°
D	29°11'57.98"	26°11'46.086"	-29.199439°	26.196135°
E	29°11'59.219"	26°11'43.3"	-29.199783°	26.195361°
F	29°11'58.744"	26°11'41.244"	-29.199651°	26.19479°
G	29°11'48.368"	26°11'45.366"	-29.199303°	26.194356°

Figure 4: Satellite view showing the position of Site Alternative 1 (brown polygon) within the surrounding landscape.

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

- The proposed mining area entails the mining of gravel from an area previously used for gravel mining purposes.

- The footprint of the proposed mining area was previously disturbed by gravel mining activities, and very little natural occurring Bloemfontein Dry Grassland Vegetation needs to be disturbed.

- Access to the proposed mining area is possible via the existing farm road with a formal (existing) entrance onto Church street just of the N6.

No-go Alternative: The no-go alternative entails no change to the *status quo* and is therefore a real alternative that needs to be considered. The gravel to be mined from the existing quarry will be sold to the building, road rehabilitation/maintenance and associated construction industry, if however, the no-go alternative is implemented:

- the Applicant cannot utilise the mineral resource on this property;
- the proposed employment opportunities will be lost;
- the people/businesses of Bloemfontein will not benefit from diversification of gravel sources which will escalating product costs.

In light of this, the no-go alternative was no deemed to be the preferred alternative.

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.

During the initial public participation process the stakeholders and I&AP's were informed of the project by means of background information documents that were sent or hand delivered directly to the contact persons. A 30-days commenting period was allowed which expired on 29th September 2020. The following I&AP's and stakeholders were informed of the project:

Table 7: List of the I&AP's and stakeholders that were notified of the proposed gravel mine project.

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
Surrounding landowners & lawful occupiers: • University of the Free State – Landowner - Sydenham	• Department of Economic Small Business Development, Tourism and Environmental Affairs;

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
No 445 Portion 0 (Remaining Extent) • University of the Free State – Paradise Lost No 1511 Portion 0 (Remaining Extent) • University of the Free State – Fairview No 1169 Portion 0 (Remaining Extent) • University of the Free State – Paradys No 2832 Portion 1 (Remaining Extent) • University of the Free State – Paradise Lost A No 2095 Portion 0 (Remaining Extent) • University of the Free State - Kolbe No 1538 Portion 0 (Remaining Extent) • South African National Road Agency - Paradise Lost No 1511 Portion 1 • South African National Road Agency - Driehoek No 2518 Portion 2 and 5 • South African National Road Agency - Economy No 2842 Portion 2 • South African National Road Agency - Sydenham No 445 Portion 2 • South African National Road Agency - Adelaide No 2874 Portion 4 • Van Rensburg Eiendoms Trust - Mr Frans Janse v Rensburg - Fairview No 2539 Potion 0 (Remaining Extent) • Eureka Holdings Trust (Mr Johan Engelbrecht) - Fairview No 2539 Portion 1 and 2 • Judith Jacoba Hofmeyr (Mr Reyno Hofmeyr) (Portion 1 (RE) of Akermans Kraal 11) • Mrs Jacomina Michiel Louw - Driehoek No 2518 Portion 4 (Remaining Extent) • Me Adele Coetzer - Thornborough No 1382 Portion 0(Remaining Extent) • 8 Mile Investments 452 (Pty) Ltd (Mr Jan Albertus Kritzinger) - Adelaide No 2874 Portion0 (Remaining Extent) • Scherangani Trade & Interest 35 (Pty) Ltd (Mr Botha Barnard) - Hillside No 2594 Portion 2	• Department of Public Works and Infrastructure; • Department of Agricultural and Rural Development; • Department of Labour; • Department of Police, Roads and Transport; • Department of Water and Sanitation; • Mangaung Metropolitan Municipality; • South African Heritage Resources Agency; • Mangaung Metropolitan Municipality - Ward 19. • ESKOM • South African National Roads Agency

SURROUNDING LANDOWNERS & INTERESTED AND AFFECTED PARTIES	STAKEHOLDERS
• Scherangani Trade & Interest 35 (Pty) Ltd (Mr Botha Barnard) - Hope Valey No 719 portion 16 • Mangaung Metropolitan Municipality - Rocklands No 684 Portion 2(Remaining Extent) • Mangaung Metropolitan Municipality - Bloemfontein No 654 portion 0 (Remaining Extent)	
I&AP'S AND STAKEHOLDERS THAT REGISTERED/COMMENTED DURING THE INITIAL NOTIFICATION PERIOD	
• University of the Free State – Landowner	

An advertisement was placed in the Bloemfontein Courant, and two on-site notices were placed at conspicuous places. Interested and Affected Parties (I&AP's) were invited to attend the public meeting on the 10th of September 2020, but no I&AP's registered for the public meeting. A 30-days commenting period was allowed which expired on 29 September 2020. Thus far, only UFS registered on the project; no other comments or objections have been received. In accordance with the timeframes stipulated in the EIA Regulations, 2014 (as amended by GNR 326 effective 7 April 2017) the Draft Basic Assessment Report was compiled and will be distributed for comment and perusal to the I&AP's and stakeholders. A 30-day commenting period, ending 19 November 2020, will be allowed for perusal of the documentation and submission of comments. The comments received on the DBAR will be incorporated into the Final Basic Assessment Report (FBAR) to be submitted for decision making to DMRE., will be allowed for perusal of the documentation and submission of comments. The comments received on the DBAR will be incorporated into the Final Basic Assessment Report (FBAR) to be submitted for decision making to DMRE.

iii) Summary of issues raised by I&APs

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

Table 8: Summary of issues raised by IAPs

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.**
AFFECTED PARTIES	**X**				
Landowner/s					
University of the Free State and adjacent landowner of: • Paradise Lost No 1511 Portion 0 (Remaining Extent) • Fairview No 1169 Portion 0 (Remaining Extent) • Paradys No 2832 Portion 1 (Remaining Extent) • Paradise Lost A No 2095 Portion 0 (Remaining Extent) • Kolbe No 1538 Portion 0 (Remaining Extent)	X	22 Sept 2020	Power of attorney was received. The UFS are investigating remuneration / rental agreement to be discussed with the proposed developer, after more information has been obtained via their attorneys.		Appendix F2: Proof of public participation process.
Lawful occupier/s of the land					
N/A		N/A	N/A	N/A	
Landowners or lawful occupiers on adjacent properties	**X**	-	-	-	-
Van Rensburg Eiendoms Trust – (Mr Frans Janse v Rensburg) adjacent landowner of: • Fairview No 2539 Potion 0 (Remaining Extent)	X	No comments recevied	N/A	N/A	N/A
Eureka Holdings Trust (Mr Johan	X	No comments	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.
Engelbrecht) adjacent landowner of: • Fairview No 2539 Portion 1 and 2		recevied			
Judith Jacoba Hofmeyr (Mr Reyno Hofmeyr) adjacent landowner of: • Driehoek No 2518 Portion 4 (Remaining Extent)	X	No comments recevied	N/A	N/A	N/A
Mrs Jacomina Michiel Louw adjacent landowner of: • P Driehoek No 2518 Portion 8	X	No comments recevied	N/A	N/A	N/A
Me Adele Coetzer adjacent landowner of • Thornborough No 1382 Portion 0(Remaining Extent)	X	No comments recevied	N/A	N/A	N/A
8 Mile Investments 452 (Pty) Ltd (Mr Jan Albertus Kritzinger) adjacent landowner of: • Adelaide No 2874 Portion0 (Remaining Extent)	X	No comments recevied	N/A	N/A	N/A
Scherangani Trade & Interest 35 (Pty) Ltd (Mr Botha Barnard) adjacent landowner of: • Hillside No 2594 Portion 2. • Hope Valey No 719 portion 16	X	No comments recevied	N/A	N/A	N/A
Municipal councillor					
Cllr. W Mokhoabane (Ward 19)	X	No comments recevied	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.
Municipality				
Mangaung Metropolitan Municipality and adjacent landowner of: • Rocklands No 684 Portion 2(Remaining Extent) • Bloemfontein No 654 portion 0 (Remaining Extent)	X	6 October 2020	Mangaung Metropolitan Municipality requests more information concerning the proposed establishment of quarry on farm Sydenham 445, in order to give meaningful comments. A hard copy of the environmental reports must be submitted to this office for review and comments. In this report, it must clearly be demonstrated in which way the proposed development will comply with the principles of environmental management as set out in Section 2 of the National Environmental Management Act 107 of 1998 which requires that environmental management must place people needs at the forefront of development and that development must be socially, environmentally and economically sustainable	Hard copies of the DBAR and supporting documentation will be send to the municipality for review.	Appendix F2: Proof public participat process
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e				N/A
Department of Police, Roads and Transport	X	No comments recevied	N/A	N/A	N/A
Eskom	X	No comments recevied.	N/A	N/A	N/A
South African National Roads Agency and adjacent landowner of:	X	No comments recevied.	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.
• Paradise Lost No 1511 Portion 1 • Driehoek No 2518 Portion 2 and 5 • Economy No 2842 Portion 2 • Sydenham No 445 Portion 2 Adelaide No 2874 Portion 4				
Communities	No community were identified within the study area.			
Dept. Land Affairs				
Department of Agricultural and Rural Development	N/A	N/A	N/A	N/A
Traditional Leaders	N/A			
Dept. Environmental Affairs				
Department of Economic Small Business Development, Tourism and Environmental Affairs	X	No comments received		
Other Competent Authorities affected				
Department of Labour	X	No comments received	N/A	NA	N/A
Department of Public Works and Infrastructure	X	No comments received	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.
Department of Rural Development and Agrarian Reform	X	No comments received	N/A	NA	N/A
Department of Water and Sanitation	X	No comments received	N/A	N/A	N/A
Mangaung Metropolitan Municipality	X	No comments received	N/A	NA	N/A
South African Heritage Resources Agency	X	No comments received	N/A	N/A	N/A
OTHER AFFECTED PARTIES				
N/A				
INTERESTED PARTIES				
N/A				

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)

This section describes the biophysical, cultural and socio-economic environment that may be affected and the baseline conditions, which are likely to be affected by the proposed mining activity.

PHYSICAL ENVIRONMENT

CLIMATE

According to the meteoblue website, Bloemfontein lies on 1398m above sea level. Bloemfontein is influenced by the local steppe climate. The average annual temperature in Bloemfontein is 16.1 °C. Annually, the rainfall is 548 mm. It receives the lowest rainfall (5 mm) in July and the highest (60 mm) in December - January. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Bloemfontein range from 17°C in June to 31°C in January. The region is the coldest during July when the mercury drops to 0°C on average during the night.

The "mean daily maximum" (solid red line in the figure below) shows the maximum temperature of an average day for every month for Bloemfontein. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years.

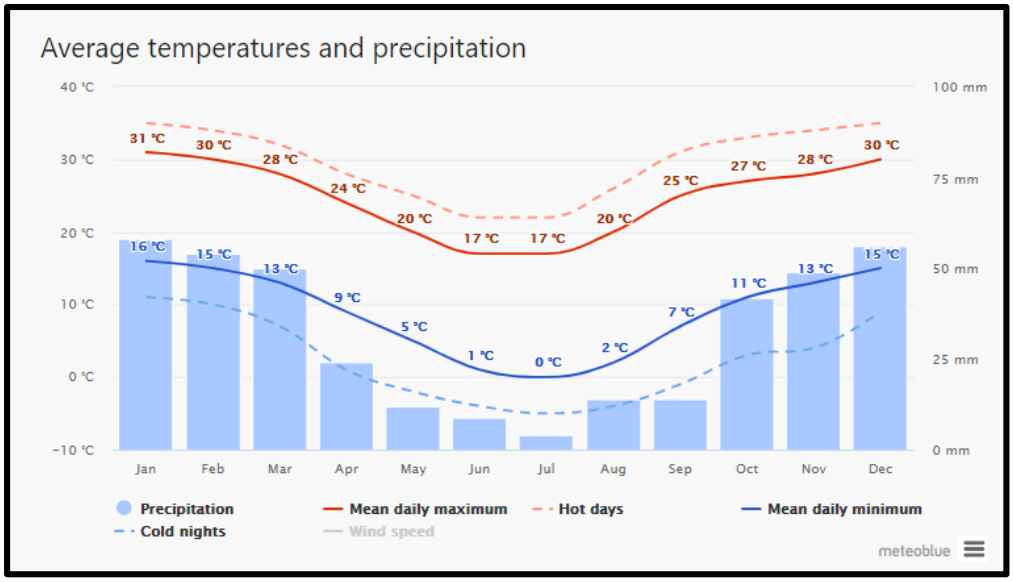


Figure 5: Statistical representation of the temperatures and precipitation for the Bloemfontein region (Chart obtained from meteoblue).

The dominant wind direction of Bloemfontein is fairly constant ranging from north-north east to east – north east for most of the year. The figures below present hours per year the wind blows from the indicated direction for the greater Bloemfontein area.

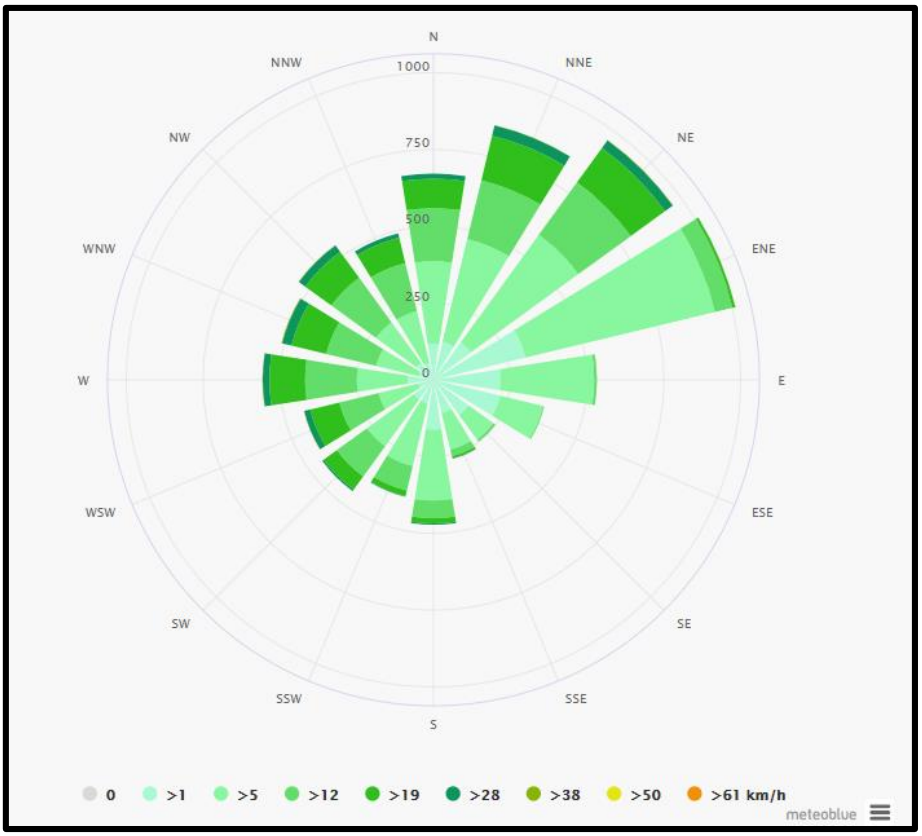


Figure 6: The wind rose for Bloemfontein shows how many hours per year the wind blows from the indicated direction. (Image obtained from meteoblue)

TOPOGRAPHY

The natural topography of the area surrounding the proposed gravel mine is best described as slightly undulating bottomland landscape covered with tall, dense grassland alternating with patches of karroid scrub occurring especially over calcrete. The figure below shows the elevation loss from the proposed mining footprint to the town of Bloemfontein to be 90 m over 9.42 km.

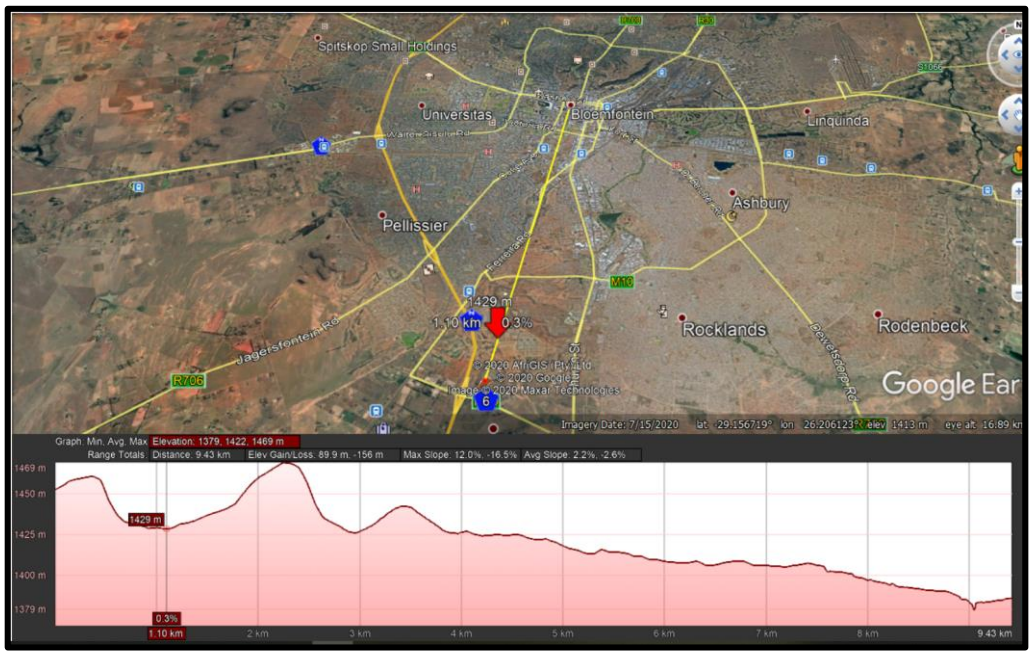


Figure 7: Elevation profile showing the topography between the proposed mining footprint (red arrow) and the town of Bloemfontein. (Image obtained from Google Earth).

VISUAL CHARACTERISTICS

The visual character of the surrounding areas mainly comprises of a dormant agricultural setting, previously mined areas (gravel). The aesthetic ambiance of the area is that of a rural area.

AIR AND NOISE QUALITY

The air quality of the study area is generally very good given the area's predominant agricultural use and rural character. Likewise, the noise ambiance is low with noise levels mainly affected by traffic along Church street, the N6 and the N1 operational in the area.

GEOLOGY AND SOIL

Sedimentary mudstones and layers of sandstone mainly of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup). Volksrust Formation mudstones of the Ecca Group (also Karoo Supergroup) dominate the western part of the area. Deep (>300 mm) layer of red sand (aeolian origin) covers the more clayey B-horizons. Soil forms

such as arable Hutton, Bainsvlei and Bloemdal occur here and are typical of the Ca land type. The Ea land type has shallow gravelly soils underlain by dolerite sills. Ca and Ae land types are nearly equally represented.

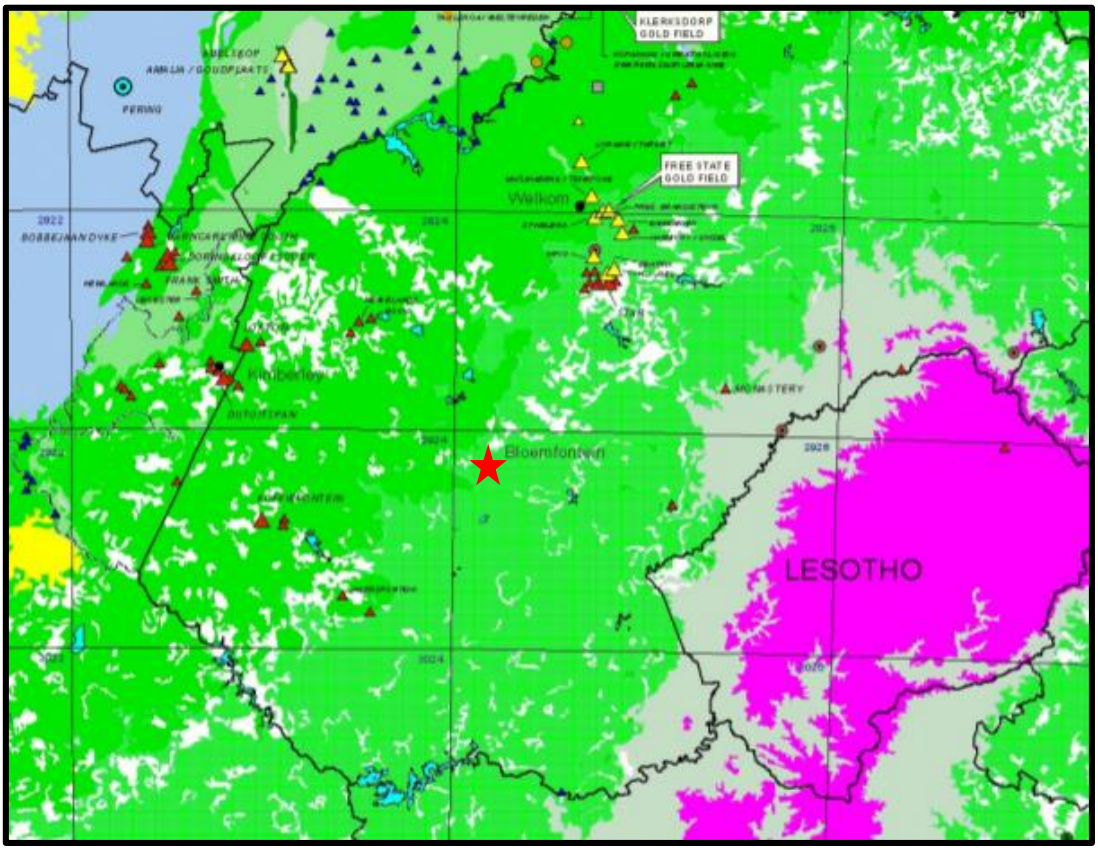


Figure 8: Indication of the simplified geology of the study area, where green represents the Beaufort Group. The proposed mining area is indicated by the red star. (Image obtained from the Council for Geoscience)

HYDROLOGY

The proposed project does not require a Water Use Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998). As mentioned earlier, the proposed mining footprint extends into an area that has previously been used for mining, and no activity will take place in or within 1km radius of any water bodies. Any water required for the implementation of the project will be bought from a registered source and transported to on site.

Table 9: Aquatic characteristics of the greater study area

Water Management Area	Upper Orange WMA 12
Sub Water Management Area	RietModder Sub-WMA
Quaternary Catchment	C52J
FEPA Status	No fresh water priority area status

According to the National Freshwater Ecosystem Priority Areas (NFEPA) map as presented by SANBI, no rivers NFEPA of conservation importance extends over the proposed footprint (see figure below). A water reservoir is located 160m north of the site boundary and will therefore not be impacted by the proposed activities.

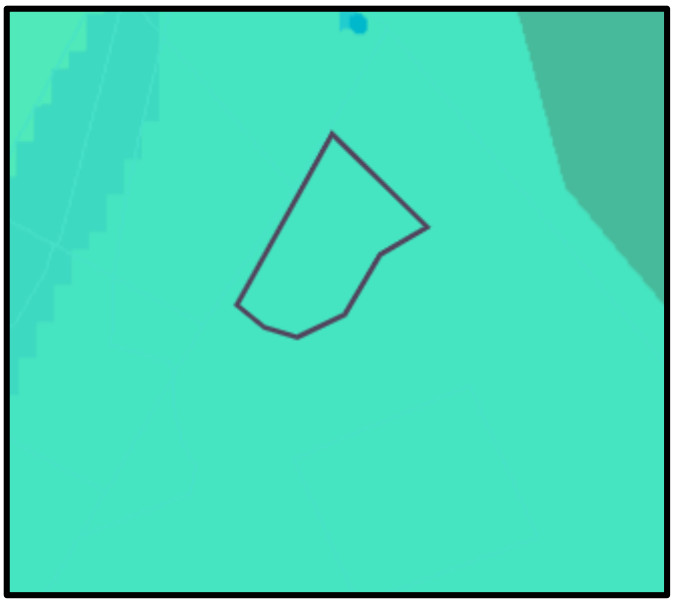


Figure 9: Map showing the proposed mining footprint (purple polygon). (Image obtained from the BGIS Map Viewer – National Wetlands and NFEPA)

BIOLOGICAL ENVIRONMENT

MINING AND BIODIVERSITY

(Information extracted from the Mining and Biodiversity Guideline: Mainstreaming Biodiversity into the Mining Sector, Department of Environmental Affairs, Department of Mineral Resources, Chamber of Mines, 2013)

The Mining and Biodiversity Guideline, compiled by the South African Mining and Biodiversity Forum (SAMBF) provides the mining sector with a practical, user-friendly manual for integrating biodiversity considerations into planning processes and managing biodiversity during the developmental and operational phases of a mine, from exploration through to closure.

When the mining footprint is layered over the Mining and Biodiversity Map, as shown in the figure below, it falls over and area of moderate biodiversity importance with a corresponding rating of moderate risk for mining. The Mining and Biodiversity Guideline's describes areas of moderate risk biodiversity importance as: "*These areas are of moderate biodiversity value."* The guideline notes that environmental screening, the EIA and specialists should focus on confirming the presence and significance of biodiversity features, and provide a site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making.

Figure 10: The Mining and Biodiversity importance map with the proposed mining footprint indicated by the green polygon. Light brown – moderate biodiversity importance, moderate risk for mining, light brown – moderate biodiversity Importance, moderate risk for mining (image obtained from the BGIS Map Viewer – Mining Guidelines).

BIODIVERSITY CONSERVATION AREAS

The Free State Biodiversity Plan (FSBP) shows that the proposed mining footprint falls within a Degraded Biodiversity Area.

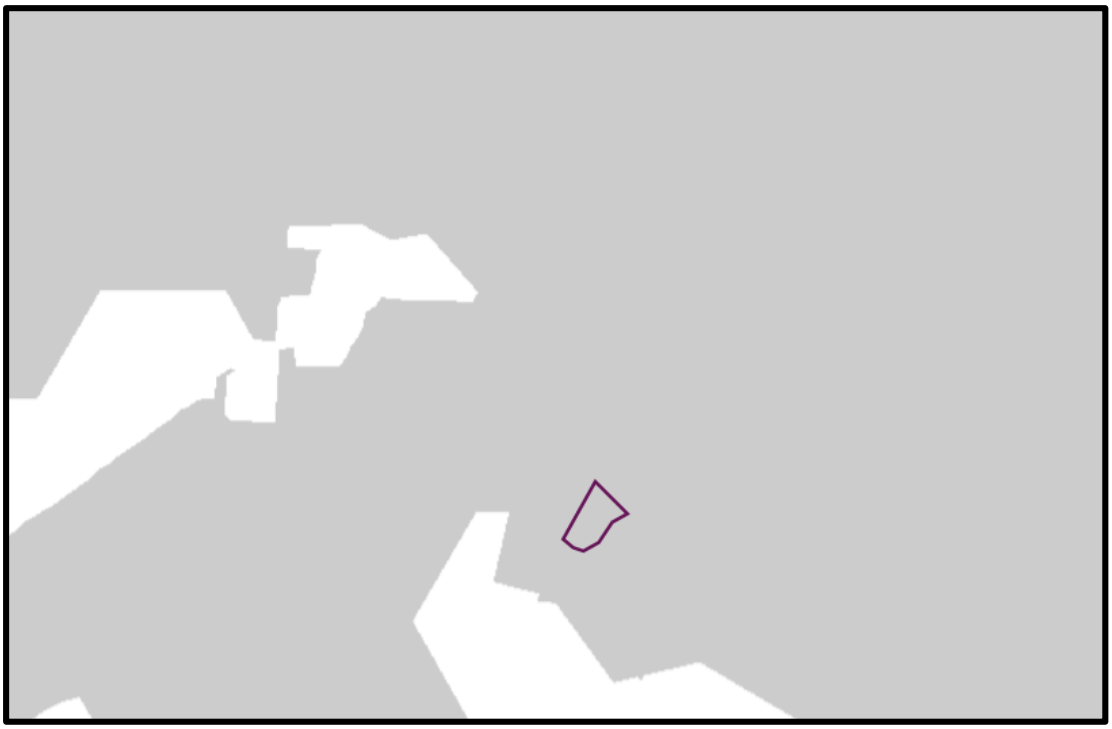


Figure 11: Free State Biodiversity Conservation Plan showing the mining area (purple polygon) in relation to the degraded areas (purple). (Image obtained from BGIS Map Viewer – Free State Conservation Plan).

GROUNDCOVER

According to Mucina and Rutherford (2012) the vegetation type of the surrounding natural areas are known as the Bloemfontein Dry Grassland (GH5) that is slightly undulating bottomland landscape covered with tall, dense grassland alternating with patches of karroid scrub occurring especially over calcrete.

Some of the important taxa found in this vegetation type include *Graminoids: Anthephora pubescens (d), Aristida congesta (d), A. diffusa (d), Cynodon dactylon (d), Digitaria argyrograpta (d), Elionurus muticus (d), Eragrostis chloromelas (d), E. lehmanniana (d), E. obtusa (d), E. plana (d), E. superba (d), E. trichophora (d), Heteropogon contortus (d), Panicum stapfianum (d), Setaria sphacelata (d), Themeda triandra (d), Tragus koelerioides (d), Aristida stipitata subsp. graciliflora, Chloris virgata, Cymbopogon pospischilii, Pogonarthria squarrosa, Sporobolus fimbriatus, Trichoneura grandiglumis, Triraphis andropogonoides. Herbs: Selago densiflora (d), Berkheya onopordifolia var. onopordifolia, Blepharis integrifolia var. clarkei, Chamaesyce inaequilatera, Commelina africana, Dicoma macrocephala, Gazania krebsiana subsp. krebsiana, Geigeria ornativa, Harpagophytum procumbens, Helichrysum caespititium, Heliotropium ciliatum, Hermannia comosa, H. tomentosa, Indigofera alternans, Lactuca dregeana, Lotononis listii, Monsonia*

burkeana, Nolletia ciliaris, Pollichia campestris. Geophytic Herbs: Oxalis depressa (d), Haemanthus humilis subsp. humilis. Succulent Herb: Tripteris aghillana var. integrifolia. Low Shrubs: Chrysocoma ciliata (d), Felicia filifolia subsp. filifolia (d), Pentzia globosa (d), P. incana (d), Amphiglossa triflora, Anthospermum rigidum subsp. pumilum, Asparagus striatus, Felicia muricata, Gnidia polycephala, Helichrysum dregeanum, Nenax microphylla, Osteospermum leptolobum, Polygala hottentotta, Selago saxatilis. Succulent Shrub: Hertia pallen.

The vegetation type is classified as endangered. According to Mucina and Rutherford (2012) only a small portion is statutorily conserved in the Soetdoring Nature Reserve. More than 40% already transformed, e.g. for crop production (mainly Ae and Ca land types) as well as by urban (and related) development (the largest part of this vegetation unit on the Ae land type is situated in the Genl De Wet military training area, west of Bloemfontein). Especially those grasslands on shallow gravelly soils as well as the low-lying areas on clayey soils are prone to karoo-bush encroachment when overgrazed. Erosion low (50%), very low (37%) or moderate (13%). A conservation target of 24% was set for the vegetation type.

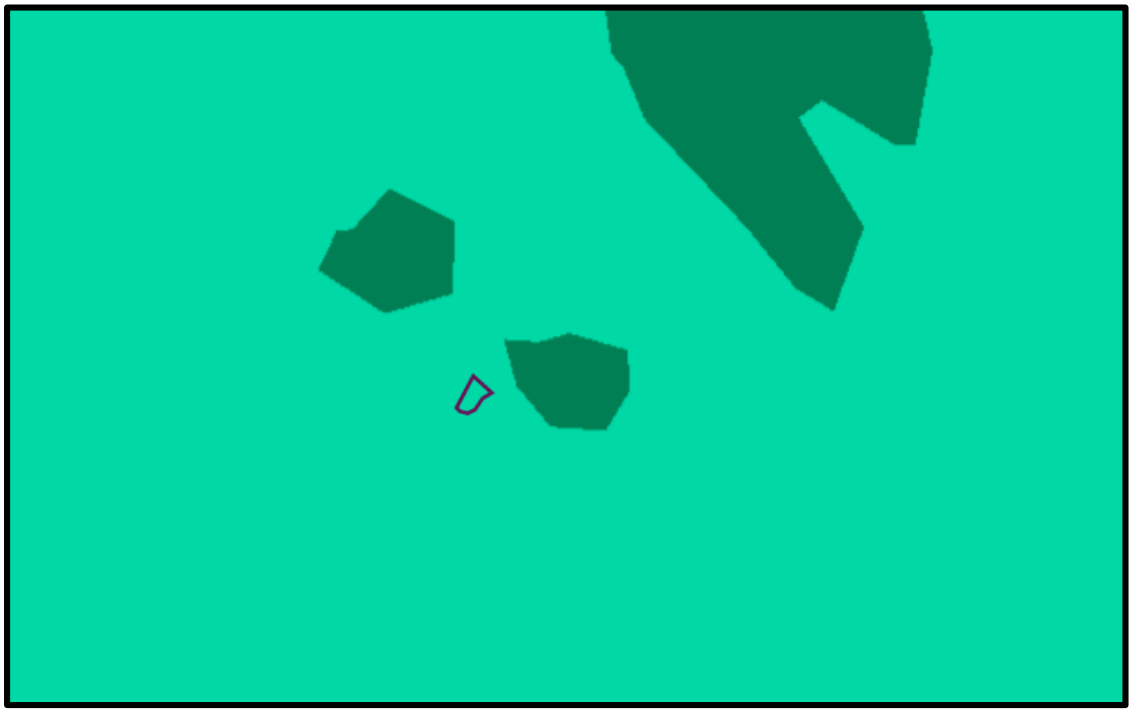


Figure 12: National vegetation cover map showing the mining area within the Bloemfontein Dry Grassland Vegetation (Gh5) (light green). (Image obtained from BGIS Map Viewer – National Vegetation Map).

FAUNA

Various small mammals and reptiles occur on the property. Larger herbivore species are very scares or absent due to the conflicting land use. 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 will be informed and managed to ensure that no fauna at the site is harmed. No poaching or hunting of animals will be allowed. All construction vehicles should adhere to a low speed limit (<40km/h) to avoid collisions with susceptible species such as snakes and tortoises. Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.

HUMAN ENVIRONMENT:

CULTURAL AND HERITAGE ENVIRONMENT

The proposed mining footprint was selected over an area that has previously been used for gravel mining and therefore no sites of archaeological or cultural importance is expected within the footprint.

The South African Heritage Resources Agency (SAHRA) compiled the Palaeontological (fossil) Sensitivity Map (PSM) to guide developers, heritage officers and practitioners in screening paleontologically sensitive areas at the onset of a project. When the footprint of the earmarked mining area is placed on the PSM, it shows the study area to extend over an area of very high (red) concern as presented in the figure below.

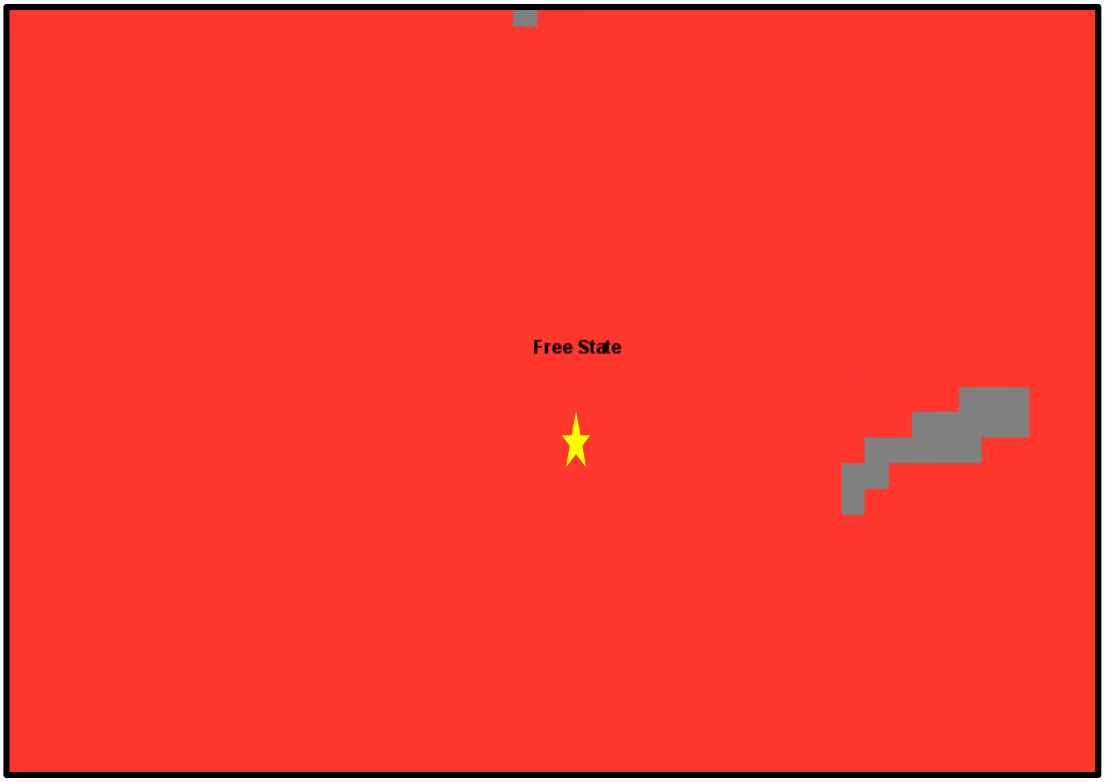


Figure 13: The SAHRA palaeontological sensitivity map shows the proposed mining footprint (yellow star) falls in an area of very high (red) concern.

SOCIO-ECONOMIC ENVIRONMENT

(Information extracted from the Mangaung Metropolitan Municipality Integrated Development Plan – 2021/22)

The proposed mining area is located within ward 19 of the Mangaung Metropolitan Municipality (MMM). Mangaung covers 9 899km² and the city is centrally located within the Free State and is accessible via National infrastructure including the N1 (which links Gauteng with the Southern and Western Cape), the N6 (which links Bloemfontein to the Eastern Cape), and the N8 (which links Lesotho in the east and with the Northern Cape in the west via Bloemfontein). Bloemfontein is the sixth largest city in South Africa and the capital of the Free State Province. The serves as the administrative headquarters of the province. It also represents the economic hub of the local economy. The area is also serviced by an east/west and north/south railway line and a national airport.

The Mangaung Metropolitan Municipality represents approximately 28% of the provincial population. During the period 2011 to 2019 an estimated population of the Mangaung increased from 775,028 to 878,834 – an increment of about 90,904 (1.6%) people.

DERMACATION AND WARDS NO. ↓	DISTRIBUTION OF POPULATION BY FUNCTIONAL AGE GROUPS			DISTRIBUTION OF POPULATION BY GENDER		DISTRIBUTION OF POPULATION BY POPULATION GROUP					DISTRIBUTION OF POPULATION (20 YEARS AND ABOVE) BY LEVEL OF EDUCATION							DISTRIBUTION OF HOUSEHOLDS BY TYPE OF DWELLING				DISTRIBUTION OF HOUSEHOLDS BY ACCESS TO PIPED (TAP) WATER		DISTRIBUTION OF HOUSEHOLDS BY TOILET FACILITY		DISTRIBUTION OF HOUSEHOLDS BY ENERGY USED FOR LIGHTING	
	0 - 14	15 - 64	65+	Male	Female	Black African	Coloured	Indian or Asian	White	Other	No schooling	Some primary	Completed primary	Some secondary	Grade 12/Std10	Higher	Other	Formal dwelling	Traditional dwelling	Informal dwelling	Other	Access to piped (tap) water	No access to piped (tap) water	Flush toilet (connected to sewerage system)	Other (No Toilets, Use Chemical toilets, VIP & Buckets)	Electricity	No electricity and use other source (Gas, Paraffin, Candles & Solar)
49400019 : WARD 19	2645	14246	717	8538	9071	12832	1467	215	3217	77	59	171	94	1539	5883	4366	90	5565	20	16	33	7290	18	7258	50	7262	46
TOTAL	17608			17608		17608					12202							5634				7308		7308		7308	

COMMUNITY NEEDS AND ASPIRATIONS	
Naming of streets in Vista Park	NEEDS TO BE ADDRESSED BY PROVINCIAL SECTOR DEPARTMENTS
Installation of street lights in Vista Park	Building of a Clinic
Removal of illegal dumping sites in Vista Park	Building of Library
Building of community hall at Vista Park	
Building of sporting complex at Vista Park	
Construction of speed humps	
Refurbishment of sewer system in Oranjesig and Vista park	
High must lights	
Tarring of Oranjesig Road	
Request for Students accommodation (new buildings)	
Recreation of Parks.	
Building of road across the railway between Vista Park and Uitsig in order for an easy access to school for those kids who are attending school in Uitsig.	
Request for a dumping board sign around the ward	

Figure 14: Demographics for ward 19 (Information extracted from the Mangaung Metropolitan Municipality Integrated Development Plan – 2021/22)

Gender Profile

The figure above indicates that distribution per gender in MMM ward 19 is comprised of 8538 males and 9071 females.

Population Profile

The figure above indicates that the total black African population of MMM ward 19 at 12632, Coloured at 1467, Asian/Indian at 215 and white population at 3217.

Education Levels

59 people of the population above the age of 20 has no schooling, 5883 has obtained matric and 4366 obtained higher education.

Employment Profile

Area	Male	Female	Total
Botshabelo	51 026	54 758	105 784
Bloemfontein	103 270	103 198	206 468
ThabaNchu	34 084	34 557	68 641
Soutpan	1 003	895	1 898
Dewetsdorp	14 297	13 200	27 497
Wepener	13 288	10 998	24 286
vanStadensrus	2 945	1 900	4 845

The above table shows that in Mangaung more men are working than women and the biggest centre of employment remains Bloemfontein followed by Botshabelo. Approximately 439 500 people or 49% of the population in Mangaung are economically active. This number is twice the number of 260 900 that was recorded two decades ago and was 38% of the total population of 2.09% exceeds the average annual labour force growth rate of 1.92% resulting in unemployment decreasing from 19.79% in 2006 to 18.32% in 2016 in the municipal area.

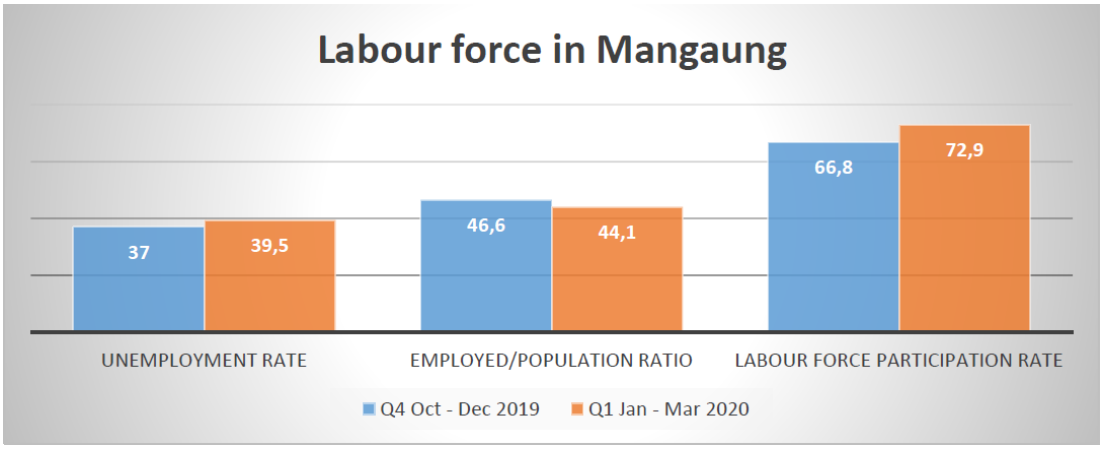


Figure 15: Labour force in Mangaung - Source: Stats SA, Labour Force Quarterly Report (Q4 Oct – Dec 2019 vs Q1 Jan – Mar 2020)

The unemployment rate in Quarter4 of 2019 was 37% and there is a worrying increament of 2.5% in Quarter 1 of 2020, further the participants of job seekers has also increased by 6.1% from the 66.8% in Quarter 4 of 2019 to 72.9% in Quarter 1 of 2020 and economically active dropped by 2.5% from 46.6% in Quarter 4 of 2019 to 44.1% in Quarter 1 of 2020. Amongst other contribution of such outcome is the effect of the COVID-19 pandemic.

The following indicates to the reader the Gross Value Add (GVA) and sector composition in the within Mangaung Municipality. The Economic drivers of the city is illustrated in the next table and it details three sector composition viz, primary, secondary and tertiary sector.

	Contribution to Employment - 2011		Contribution to Employment - 2015		Contribution to Employment - 2018		% growth p.a.		Trend		Employment Increment (net Change)						
Sector	Number	%	Number	%	Number	%	2011-2015	2015-2018	2011-2015	2015-2018	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Primary	10,524	4%	11,317	4%	13,051	5%	1.8%	4.9%	793	1,734	63	85	134	511	575	784	375
Agriculture, forestry, fishing	8,264	3%	8,367	3%	9,290	3%	0.3%	3.5%	103	923	-227	190	124	16	165	455	303
Mining and quarrying	2,260	1%	2,950	1%	3,761	1%	6.9%	8.4%	690	811	290	-105	10	495	410	329	72
Secondary	31,584	13%	34,405	13%	36,511	14%	2.2%	2.0%	2,822	2,106	-1,154	846	1,436	1,693	250	598	1,258
Manufacturing	14,578	6%	16,469	6%	15,561	6%	3.1%	-1.9%	1,891	-908	-698	1,076	1,051	462	-809	-380	281
Electricity, gas and water	1,190	1%	2,129	1%	2,440	1%	15.6%	4.7%	939	312	28	87	286	538	288	79	-56
Construction	15,815	7%	15,807	6%	18,510	7%	0.0%	5.4%	-8	2,703	-484	-317	99	694	772	898	1,033
Tertiary	195,245	82%	213,469	82%	220,826	82%	2.3%	1.1%	18,225	7,357	-2,170	3,919	9,132	7,343	2,194	1,129	4,034
Wholesale/retail trade, catering, accommodation	52,527	22%	57,885	22%	58,392	22%	2.5%	0.3%	5,358	507	-2,243	93	2,850	4,657	2,183	-86	-1,589
Transport, storage, communication	12,101	5%	12,090	5%	14,083	5%	0.0%	5.2%	-11	1,993	-853	118	169	555	617	924	451
Finance, insurance, real estate, business services	35,144	15%	32,482	13%	36,986	14%	-1.9%	4.4%	-2,662	4,505	-1,327	-853	334	-817	-519	1,544	3,480
Community, social, personal, government services	66,905	28%	81,430	31%	79,416	29%	5.0%	-0.8%	14,525	-2,014	2,371	5,066	5,294	1,793	-1,601	-1,676	1,262

Figure 16: The figure above indicates to the reader the Gross Value Add (GVA) and sector composition in the within Mangaung Municipality. The Economic drivers of the city is illustrated in the next table and it details three sector composition viz, primary, secondary and tertiary sector.

(b) Description of the current land uses

The Remaining Extent of the farm Sydenham 445, Registration Division of Bloemfontein, Free State province is situated in a semi-rural setting. The N1 forms the western boundary of the farm, while Church street and the N6 borders the site to the south and south east. The land use of the property mainly comprises of dormant agricultural land. The land use was also extended to include small scale mining.

The main land use of the surrounding properties is agricultural (small holdings). The South Park cemetery is located 500m from the site towards the North but will not be impacted by the mining activities. The following table provides a description of the land uses and/or prominent features that currently occur within a 500 m radius of the proposed site:

Table 10: Land uses and/or prominent features that occur within 500 m radius of S1 and S2.

LAND USE CHARACTER	YES	NO	DESCRIPTION
Natural area	**YES**	-	The study area is surrounded by natural areas used for agricultural (small holding) purposes.
Low density residential	-	**NO**	
Medium density residential	-	**NO**	
High density residential	-	**NO**	
Informal residential	-	**NO**	
Retail commercial & warehousing	-	**NO**	
Light industrial	-	**NO**	
Medium industrial	-	**NO**	
Heavy industrial	-	**NO**	
Power station	-	**NO**	
High voltage power line	-	**NO**	
Office/consulting room	-	**NO**	
Military or police base / station / compound	-	**NO**	
Spoil heap or slimes dam	-	**NO**	
Quarry, gravel or borrow pit	**YES**	-	The footprint of the proposed mining area extends over an area previously used for gravel mining purposes.
Dam or reservoir	**YES**	-	A farm reservoir lays ±160 m north of the proposed mining area. The mining activities will not impact on the reservoir.
Hospital/medical centre	-	**NO**	
School/ crèche	-	**NO**	
Tertiary education facility	**YES**		The Sydenham Research Station of the UFS lays south-east of the proposed mining area.
Church	-	**NO**	
Old age home	-	**NO**	
Sewage treatment plant	-	**NO**	
Train station or shunting yard	-	**NO**	
Railway line	-	**NO**	The nearest railway line is located ±1.5 km from the earmarked area.
Major road (4 lanes or more)	**YES**		The N1 passes the site on the western side
Airport	-	**NO**	The Central Radio Flyers Club is located 600 m north of the proposed mining area.
Harbour	-	**NO**	

LAND USE CHARACTER	YES	NO	DESCRIPTION
Sport facilities	-	**NO**	
Golf course	-	**NO**	
Polo fields	-	**NO**	
Filling station	-	**NO**	A truck stop / filling station is located ± 580m from the earmarked area
Landfill or waste treatment site	-	**NO**	The Southpark Landfill site is located ±1 km from the earmarked area.
Plantation	-	**NO**	
Agriculture	**YES**	-	The proposed footprint forms part of an agricultural active farm.
River, stream or wetland		**NO**	
Nature conservation area	-	**NO**	
Mountain, hill or ridge	**YES**	-	The mining area is located on a low hill (koppie).
Museum	-	**NO**	
Historical building	-	**NO**	
Protected Area	-	**NO**	
Graveyard	**YES-**		The South park cemetery is located ± 500m from the earmarked area. The mining activities will not impact on the cemetery.
Archaeological site	-	**NO**	
Other land uses (describe)	-	**NO**	

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

SPECIFIC ENVIRONMENTAL FEATURES

SITE SPECIFIC TOPOGRAPHY

The natural topography of the area surrounding the proposed gravel mine is best described as slightly undulating bottomland landscape covered with tall, dense grassland alternating with patches of karroid scrub occurring especially over calcrete. The figure below shows the elevation loss from the proposed mining footprint to the town of Bloemfontein to be 90 m over 9.42 km.

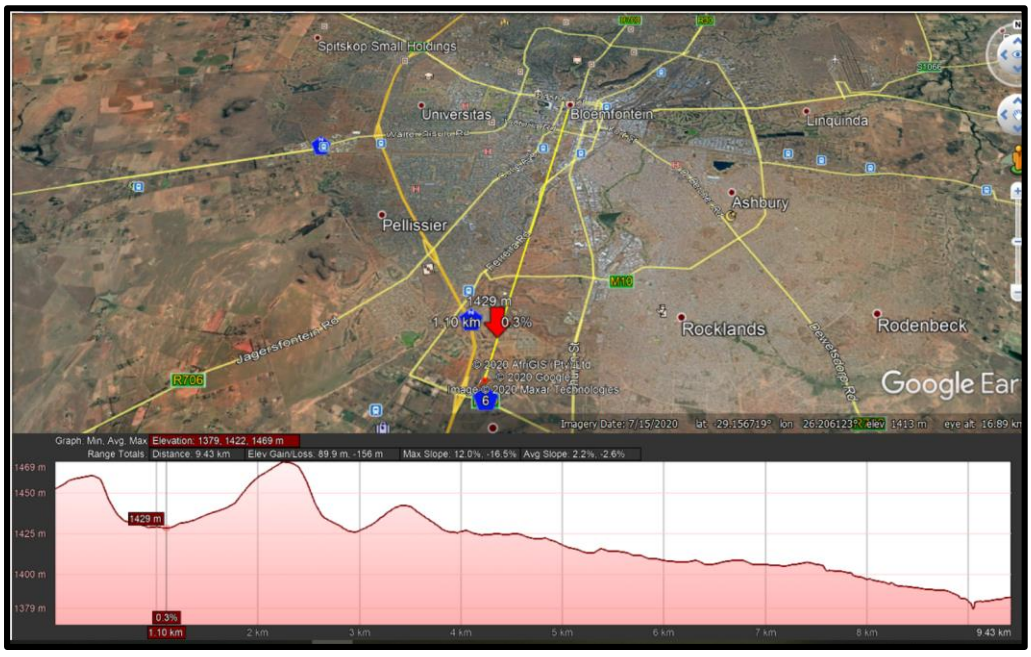


Figure 17: Elevation profile of the proposed mining footprint (Image obtained from Google Earth).

SITE SPECIFIC VISUAL CHARACTERISTICS

The proposed mining activities will be visible within close proximity (±1 km radius) of the footprint. However, as one moves away the visibility of the area greatly lessens. The figure below shows the viewshed analysis for the footprint within a ±10 km radius. The green shaded areas show the positions from where the mining area will be visible. From this analysis it is proposed that the visual impact of the proposed gravel mining operation will be of low significance, especially as no permanent structures will be constructed. The small scale of the proposed operation, and the mining within an existing excavation area contributes to the low visual significance. Should the Applicant successfully rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine.

Figure 18: Viewshed of the proposed mining footprint where the green shaded areas shows the positions from where the mining area (Proposed mining area) will be visible. (Image obtained from Google Earth).

SITE SPECIFIC AIR AND NOISE QUALITY

The residential dwellings nearest to the proposed footprint is opposite the N1 approximately 800m away (south-west). Currently the air quality of the study area is mainly impacted on by the surrounding traffic on the N1 and N6 surrounding the site.

Emission into the atmosphere is controlled by the National Environmental Management: Air Quality Act, 2004. The proposed mining activity does not trigger an application in terms of the said act. The proposed activity will contribute the

emissions mechanical mining equipment to the receiving environment for the duration of the operational phase. Should the permit holder implement the mitigation measures proposed in this document and the EMPR the impact on the air quality of the surrounding environment is deemed to be of low significance and compatible with the current land use.

The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the traffic of the surrounding area. The distance of the proposed mining area from residential infrastructure further lessens the potential noise impact.

SITE SPECIFIC GEOLOGY AND SOIL

The site specific geology is representative of the regional geology and soil as described earlier in this report. Sedimentary mudstones and layers of sandstone mainly of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup). Volksrust Formation mudstones of the Ecca Group (also Karoo Supergroup) dominate the western part of the area. Deep (>300 mm) layer of red sand (aeolian origin) covers the more clayey B-horizons. Soil forms such as arable Hutton, Bainsvlei and Bloemdal occur here and are typical of the Ca land type. The Ea land type has shallow gravelly soils underlain by dolerite sills. Ca and Ae land types are nearly equally represented.

The gravel of the study area is a coarse gravel and highly suitable for construction purposes. The material to be mined is already in aggregate form, gravel will be excavated by means of earth moving equipment and then loaded and hauled to a crushing and screening plant.

SITE SPECIFIC HYDROLOGY

The proposed project does not require a Water Use Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998). As mentioned earlier, the proposed mining footprint extends into an area that has previously been used for mining, and no activity will take place in or within 1km radius of any water bodies. Any water required for the implementation of the project will be bought from a registered source and transported to on site.

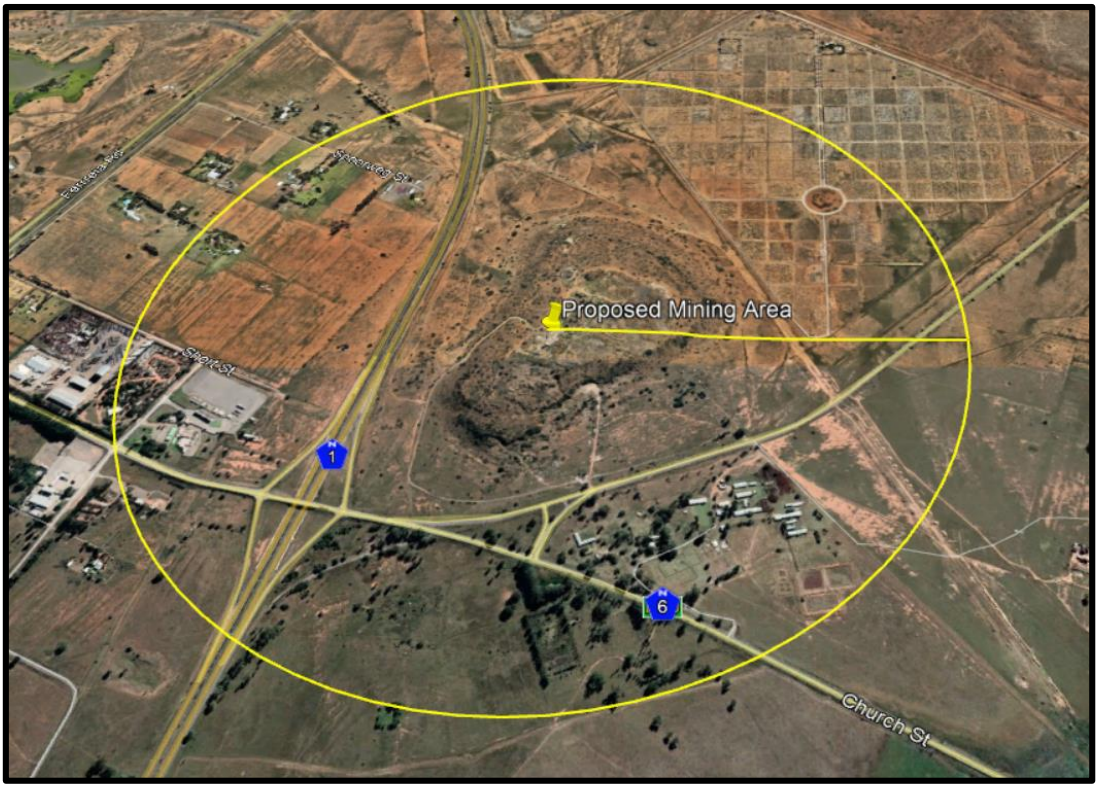


Figure 19: Satellite view showing 1km radius from the position of mining footprint. (Image obtained from Google Earth)

SITE SPECIFIC MINING AND BIODIVERSITY CONSERVATION AREAS

As mentioned earlier, when the mining footprint is layered over the Mining and Biodiversity Map, it falls over and area of moderate biodiversity importance with a corresponding rating of moderate risk for mining. The Mining and Biodiversity Guideline's describes areas of moderate risk biodiversity importance as: "*These areas are of moderate biodiversity value."* The guideline notes that environmental screening, the EIA and specialists should focus on confirming the presence and significance of biodiversity features, and provide a site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making.

SITE SPECIFIC GROUNDCOVER

The site specific groundcover of the mining area was highly altered due to the previous mining operations, and very little natural vegetation remains. As per the figure below the groundcover varies between bare none vegetated (white area), grassland (light brown area), low shrub land (purple area), woodland / open bush (green area) and Mines to semi bare (pink area).

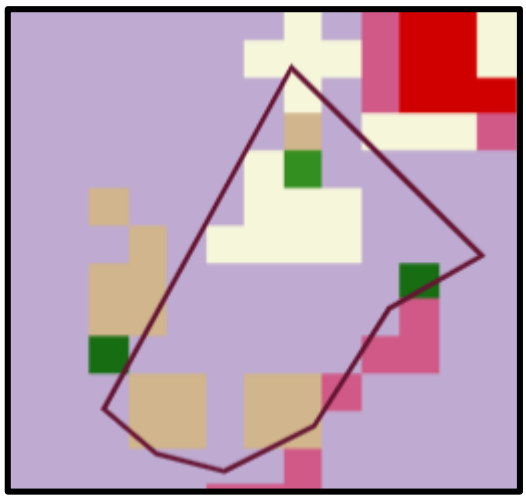


Figure 20: National land cover map showing the mining area (Image obtained from BGIS Map Viewer – National land cover Map 2014)

At the time of the inspection, invasive plant species such as wild tobacco (*Nicotiana glauca*) and American Pepper (*Schinus molle*) were noted within the proposed footprint area. The Applicant will implement an invasive plant species management plan and constantly monitor the mining area for problem species.

Several Aloe spp. were also noted during the inspection. A botanist will be consulted for the inspection of these plants, and plant removal permits will be obtained from the Department of Economic Small Business Development Tourism and Environmental Affairs (DETEA) (if needed). In light of this, there should be a preconstruction walk-through of the development footprint/project site in order to locate individual plant species of conservation concern. Any translocatable protected species must be relocated to a suitable and similar habitat where these plants can grow without any disturbance.

SITE SPECIFIC FAUNA

Various small mammals and reptiles occur on the property. Larger herbivore species are very scares or absent due to the conflicting land use. 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 will be informed and managed to ensure that no fauna at the site is harmed. No poaching or hunting of animals will be allowed. All construction vehicles must adhere to a low speed limit (<40km/h) to avoid collisions with susceptible species such as snakes and tortoises. Trenches and deep excavations must not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed must contain soil ramps allowing fauna to escape the trench.

SITE SPECIFIC CULTURAL AND HERITAGE ENVIRONMENT

No sites of archaeological or cultural importance were identified during the site inspection, and consultation with the interested and affected parties also did not identify any potential area of concern. The potential impact of the proposed mining activities on the cultural and/or heritage environment is therefore deemed to be insignificant, however the Applicant will implement a chance-find protocol on site for the duration of the site establishment-, operational- and decommissioning phase.

SITE SPECIFIC INFRASTRUCTURE

The existing infrastructure within 500m of the proposed mining area includes a connecting road of the N6, the N1 a water reservoir and a nearby flying club. None of the existing infrastructure falls within the site area and will therefore not be affected.

(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 D.

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 of the proposed project. 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.

SITE ESTABLISHMENT

Visual intrusion as a result of site establishment

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low					**Degree of Mitigation: Partial**		
1	2	1	1.3	3	3	3	**3.9**

Loss of topsoil and fertility as a result of site establishment

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium					**Degree of Mitigation: Full**		
3	2	1	3	4	1	2.5	**7.5**

Infestation of the topsoil heaps and mining area with invader plant species as a result of site establishment

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low-Medium					**Degree of Mitigation: Full**		
3	2	1	3	4	1	2.5	**7.5**

Potential impact on fauna within the footprint area as a result of site establishment

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low					**Degree of Mitigation: Full**		
1	2	1	1.3	2	1	3.5	**1.95**

Dust nuisance as a result of the as a result of site establishment

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
1	2	1	1.3	4	1	2.5	**3.25**

Noise nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Partial**		
1	2	1	1.3	4	1	2.5	**3.25**

Work opportunities to local residents **(Positive Impact)**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: N/A**		
1	2	5	2.6	5	5	5	**13**

MINING OF GRAVEL

Soil contamination from hydrocarbon spills as a result of mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Full**		
5	5	5	5	3	1	2	**10**

Disturbance to fauna within the footprint area as a result of mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
3	4	4	3.6	2	2	2	**7.2**

Noise nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Partial**		
3	4	2	3	4	5	4.5	**13.5**

Dust nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Full**		
3	4	2	3	4	5	4.5	**13.5**

Potential impact on areas/infrastructure of heritage or cultural concern as a result of mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
4	4	1	3	1	1	1	**3**

CRUSHING, SCREENING, STOCKPILING AND TRANSPORTING MATERIAL FROM SITE:

Loss of stockpiled material due to ineffective storm water control

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
3	4	1	2.6	3	2	2.5	**6.5**

Dust nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Full**		
3	4	2	3	4	5	4.5	**13.5**

Noise nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Partial**		
3	4	2	3	4	5	4.5	**13.5**

Potential impact associated with littering and hydrocarbon spills

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Full**		
3	4	2	3	4	5	4.5	**13.5**

Infestation of denuded areas with invader plant species

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Full**		
3	4	2	3	5	2	3.5	**10.5**

Deterioration of the access road to the mining area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
2	4	2	2.6	3	2	3.5	**9.1**

Overloading of trucks having an impact on the public roads

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium-High					**Degree of Mitigation: Full**		
4	4	5	4.3	4	5	4.5	**19.4**

SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA

Erosion of returned topsoil after rehabilitation

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
3	5	2	3.3	4	2	3	**9.9**

Infestation of the reinstated area with invader plant species

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium					**Degree of Mitigation: Full**		
3	4	2	3	5	2	3.5	**10.5**

Noise nuisance as a result of the decommissioning activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Partial**		
1	1	2	1.3	1	5	3	**3.9**

Potential impact associated with litter/hydrocarbon spills left at the mining area

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium						**Degree of Mitigation: Full**	
3	5	2	3.3	4	4	4	**13.2**

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.)

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

DEFINITIONS AND CONCEPTS:

Environmental significance:

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

- Environmental significance is a value 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
- Determining significance involves the amount of change to the environment perceived to be acceptable to affected communities.

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

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

Impact

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

Consequence

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

Likelihood

A qualitative term covering both probability and frequency.

Frequency

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

Probability

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

Environment

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

Methodology that will be used

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

Environmental Significance = Overall Consequence X Overall Likelihood

Determination of Overall Consequence

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

Determination of Severity / Intensity

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

The table below will be used to obtain an overall rating for severity, taking into consideration the various criteria.

Table 11: Table to be used to obtain an overall rating of severity, taking into consideration the various criteria.

Type of criteria	Rating

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

Determination of Duration

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

Table 12: Criteria for the rating of duration.

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

Determination of Extent/Spatial Scale

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

Table 13: Criteria for the rating of extent / spatial scale.

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

Determination of Overall Consequence

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

Table 14: Example of calculating overall consequence.

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

Determination of Likelihood:

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

Determination of Frequency

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

Table 15: Criteria for the rating of frequency.

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

Determination of Probability

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

Table 16: Criteria for the rating of probability.

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

Overall Likelihood

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

Table 17: Example of calculating overall likelihood.

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

Determination of Overall Environmental Significance:

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

Table 18: Determination of overall environmental significance.

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

Qualitative description or magnitude of Environmental Significance

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

Table 19: Description of environmental significance and related action required.

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

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

High Of the highest order possible within the bounds of impacts which could occur. In the case of negative impacts, there would be no possible mitigation and / or remedial activity to offset the impact at the spatial or

time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.

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

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)

The environmental impact assessment process assessed the feasibility of the proposed site alternative to identify fatal flaws that are deemed as severe as to prevent the activity continuing, or warrant another site or project alternative. The outcome of the assessment showed that should the mitigation measures and monitoring programmes proposed in this document be implemented, no fatal flaws could be identified that prevents the activity continuing. In light of the above, the mining proposal was updated to incorporate the project related mitigation measures and monitoring programmes identified during the assessment process. The preferred development footprint was subsequently finalized and is depicted on

the attached site activities plan (Appendix C). The gravel mining area can be moved to various alternative sites within close proximity of the proposed mining area but will entail disturbing a greenfield area. However, the proposed mining area was identified as the preferred and only viable site alternative as it entails the mining of an area previously used for gravel mining purposes. In light of this, S1 was identified during the assessment phase of the environmental impact assessment, by the Applicant and project team due to the following:

- The footprint of the proposed mining area was previously disturbed by gravel mining activities,
- Access to the proposed mining area is possible via the existing farm road with a formal (existing) entrance onto Church street just of the N6.
- The quality of the gravel, in the earmarked area, complies with the requirements of the Applicant's clients and/or contracts.

PROJECT ASSOCIATED POSITIVE IMPACTS:

- Possible work opportunities to local residents;
- Return of the mining area to agricultural use upon closure of the project; and
- Diversification of the land use of the property.

POTENTIAL NEGATIVE IMPACTS:

SITE ESTABLISHMENT

- Visual intrusion as a result of site establishment,
- Loss of topsoil and fertility during mining and stockpiling;
- Infestation of the topsoil heaps and mining area with invader plant species;
- Potential impact on fauna within the footprint area;
- Dust nuisance as a result of the mining activities;
- Noise nuisance as a result of the mining activities; and

MINING OF GRAVEL

- Soil contamination from hydrocarbon spills;
- Disturbance to fauna within the footprint area;
- Noise nuisance as a result of the mining activities;
- Potential impact on area/infrastructure of heritage or cultural concern; and

CRUSHING, SCREENING, STOCKPILING AND TRANSPORTING MATERIAL FROM SITE

- Loss of stockpiled material due to ineffective storm water control;
- Dust nuisance as a result of the mining activities;
- Noise nuisance as a result of the mining activities;
- Potential impact associated with littering and hydrocarbon spills;
- Infestation of denuded areas with invader plant species;
- Deterioration of the access road to the mining area; and
- Overloading of trucks having an impact on the public roads.

SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA

- Erosion of returned topsoil after rehabilitation;
- Infestation of the reinstated area with invader plant species;
- Noise nuisance as a result of the decommissioning activities; and
- Potential impact associated with litter/hydrocarbon spills left at the mining area.

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)

The following mitigation measures are proposed to address/minimize the impact of the proposed activity on the surrounding environment:

VISUAL CHARACTERISTICS

Visual Mitigation:

The risk of the proposed mining activities 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.

- Mining must be contained to the boundaries of the permitted area.
- The site must have a neat appearance and be kept in good condition at all times.
- The permit holder must limit vegetation removal (if applicable), and stripping of topsoil may only be done immediately prior to the use of a specific area.
- Upon closure the mining area must be rehabilitated and levelled to remove the visual impact on the aesthetic value of the area.

AIR AND NOISE QUALITY

Fugitive Dust Emission Mitigation:

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

- The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, straw, water spraying and/or environmentally friendly dust-allaying agents that contains no PCB's (e.g. DAS products).
- The site manager must ensure continuous assessment of the dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- Speed on the access road must be limited to 40 km/h to prevent the generation of excess dust.
- Areas devoid of vegetation, which could act as a dust source, must be minimized.
- Loads must be flattened and covered to prevent spillage of material during transportation, also preventing windblown dust.
- Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and resulting impacts.
- All dust generating activities shall comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA (Act 39 of 2004) and ASTM D1739 (SANS 1137:2012).
- Best practice measures shall be implemented during the stripping of topsoil, loading, and transporting of the gravel from site to minimize potential dust impacts.

Noise Handling:

The risk of noise, generated as a result of 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 permit holder must ensure that employees and staff conduct themselves in an acceptable manner while on site.
- 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 National Road Traffic Act, 1996 (Act No 93 of 1996).
- Best practice measures shall be implemented in order to minimize potential noise impacts.
- A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring

must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008.

GEOLOGY AND SOIL

Topsoil Management:

The following topsoil management mitigation measures are proposed:

- The upper 300 mm of the soil must be stripped and stockpiled.
- Topsoil is a valuable and essential resource for rehabilitation and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes.
- Topsoil stripping, stockpiling and re-spreading must be done in a systematic way. The mining plan have to be such that topsoil is stockpiled for the minimum possible time.
- The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas.
- Topsoil stockpiles must be protected against losses by water and wind erosion. Stockpiles must be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion.
- Topsoil heaps may not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.
- The temporary topsoil stockpiles must be kept free of invasive plant species.
- Storm- and runoff water must be diverted around the mining area to prevent erosion.
- The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site.
- The permit holder must strive to re-instate topsoil at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, before vegetation is established, is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal.
- A cover crop must be planted, irrigated and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass production. It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover crop is well established.
- The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.

HYDROLOGY

Storm Water Mitigation:

The following mitigation measures are proposed with regard to storm water handling:

- Drainage must be controlled to ensure that runoff from the mining area does not culminate in off-site pollution.
- Storm water must be diverted around the topsoil heaps and mining area to prevent erosion.
- Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose:
  - 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.

MINING AND BIODIVERSITY & GROUNDCOVER

Management of Invasive Plant Species:

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

- An invasive plant species management plan (Appendix I) must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities.
- All stockpiles (topsoil) must be kept free of invasive plant species.
- Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:
  - The plants can be uprooted, felled or cut off and can be destroyed completely.
  - The plants can be treated chemically by a registered pest control officer (PCO) through the use of an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.

FAUNA

Protection of Fauna:

The risk resulting from the proposed mining activity on fauna of the footprint area as well as the surrounding environment, can be reduced to Low through the implementation of the mitigation measures listed below:

- The site manager must ensure 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.

CULTURAL AND HERITAGE ENVIRONMENT

Archaeological, Heritage and Palaeontological Aspects:

The impact on archaeological, heritage and palaeontological aspects, as a result of the proposed mining activities, can be reduced to being negligible through the implementation of the mitigation measures listed below:

- All mining must be confined to the development footprint area.
- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager must inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who must notify SAHRA.
- Work may only continue once the go-ahead was issued by SAHRA.

EXISTING INFRASTRUCTURE

Access Road Mitigation:

The impact on the access road, as a result of the proposed mining activities, can be reduced to being Low through the implementation of the mitigation measures listed below:

- Storm water must be diverted around the access road to prevent erosion.
- Vehicular movement must be restricted to the existing access road and crisscrossing of tracks through undisturbed areas must be prohibited.
- Rutting and erosion of the access road caused as a direct result of the mining activities must be repaired by the permit holder.
- Overloading of the trucks must be prevented, and proof of load weights must be filed for auditing purposes.

GENERAL

Waste Management:

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

- Regular vehicle maintenance, repairs and services may only take place in a demarcated service area of the permit holder. If emergency repairs are needed on equipment not able to move to the workshop / service area, 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 workshop in order to ensure proper disposal.
- Ablution facilities must be provided in the form of a chemical toilet. The chemical toilet must be placed outside the 1:100 year floodline of any open water resource, and must be serviced at least once every two weeks for the duration of the mining activities.
- The use of any temporary, chemical toilet facilities may not cause any pollution to water sources or pose a health hazard. In addition, no form of secondary pollution should arise from the disposal of refuse or sewage from the temporary, chemical toilets. Any pollution problems arising from the above are to be addressed immediately by the permit holder.
- If a diesel bowser is used on site, it must be equipped with a drip tray at all times. Drip trays must be used during each and every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling.
- Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site.
- A spill kit must be available on-site which can be operated by trained employees for the adhoc remediation of minor chemical and hydrocarbon spillages.
- 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.

- Should spillage occur, such as oil or diesel leaking from a burst pipe, the contaminated soil must, within the first hour of occurrence, be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. Proof must be filed.
- A waste management plan must be compiled by site management and implemented on site. The plan must focus on the waste hierarchy of the NEM:WA.
- General waste must be contained in marked, sealable, refuse bins placed at a designated area, to be removed when filled to capacity to a recognised general waste landfill site.
- No waste may be buried or burned on the site.
- No chemicals or hazardous materials may be stored at the mining area.
- It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities.
- All machinery must be parked at the mining area with drip trays placed underneath stationary vehicles.

Management of Health and Safety Risks:

The following mitigation measures are proposed to minimise the potential health and safety impacts:

- Adequate ablution facilities and water for human consumption must daily be available on site.
- Workers must have access to the correct personal protection equipment (PPE) as required by law.
- All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).

ix) Motivation where no alternative sites were considered.

As mentioned previously, the proposed mining area was identified as the preferred and only viable site alternative as it entails the mining of an area previously used for gravel mining purposes, the gravel mining area can be moved to various alternative sites within close proximity of the proposed mining area but will entail disturbing a greenfield area. However, the proposed mining area, as indicated on the Regulation 2.2 Mine Plan (attached as Appendix A), was identified as the preferred and only viable site alternative as it entails the mining of an area previously used for gravel mining purposes, and the use of the existing access road and entrance to the site. In light of this, no alternative sites were considered during this assessment.

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

Site Alternative 1 was identified during the assessment phase of the environmental impact assessment as the preferred and only site alternative. The following matters contributed to the identification of the preferred development footprint:

1. **Topography** –The natural topography of the area surrounding the proposed gravel mine is best described as slightly undulating bottomland landscape covered with tall, dense grassland alternating with patches of karroid scrub occurring especially over calcrete. The elevation loss from the proposed mining footprint to the town of Bloemfontein is found to be 90 m over 9.42 km.

2. **Visual Characteristics** – The viewshed analysis showed that the visual impact of the proposed gravel mining operation will be of low significance. The small scale of the proposed operation, and the mining within an existing excavation area contributes to the low visual significance. Should the Applicant successfully rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine.

3. **Air and Noise Quality** – The proposed activity will contribute the emissions mechanical mining equipment to the receiving environment for the duration of the operational phase. Should the permit holder implement the mitigation measures proposed in this document and the EMPR the impact on the air quality of the surrounding environment is deemed to be of low significance and compatible with the current land use. The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the traffic of the surrounding area.

4. **Geology and Soil –** The material to be mined is already in aggregate form, only excavation equipment is needed. Sedimentary mudstones and layers of sandstone mainly of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup). Volksrust Formation mudstones of the Ecca Group (also Karoo Supergroup) dominate the western part of the area. Deep (>300 mm) layer of red sand (aeolian origin) covers the more clayey B-horizons. Soil forms such as arable Hutton, Bainsvlei and Bloemdal occur here and are typical of the Ca land type. The Ea land type has shallow gravelly soils underlain by dolerite sills. Ca and Ae land types are nearly equally represented.

5. **Mining, Biodiversity and Groundcover –** Ground-truth showed that the proposed footprint of the mining area is highly disturbed. The Applicant will make use of the existing access point to the mining area. It is proposed that should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the vegetation and groundcover in general is deemed to be of low significance.

6. **Fauna -** No protected or red data species were identified to be resident within the proposed footprint area. Various small mammals and reptiles occur on the property. Larger herbivore species are very scares or absent due to the conflicting land use. 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 will be informed and managed to ensure that no fauna at the site is harmed. No poaching or hunting of animals will be allowed. All construction vehicles must adhere to a low speed limit (<40km/h) to avoid collisions with susceptible species such as snakes and tortoises. Trenches and deep excavations must not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed must contain soil ramps allowing fauna to escape the trench.

7. **Cultural and Heritage Environment** - No sites of archaeological or cultural importance were identified during the site inspection, and consultation with the interested and affected parties also did not identify any potential area of concern. The Applicant will implement a chance-find protocol on site for the duration of the site establishment-, operational- and decommissioning phase.

8. **Site Specific Infrastructure** – The existing infrastructure within 500 m of the proposed mining area includes a connecting road of the N6, the N1 a water reservoir and a flying club. None of the existing infrastructure falls within the site area and will therefore not be affected.

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.

SITE ESTABLISHMENT

Visual intrusion as a result of site establishment

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Partial**		
1	2	1	1.3	3	3	3	**3.9**

Loss of topsoil and fertility as a result of site establishment

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
3	1	1	1.6	2	2	2	**3.2**

Infestation of the topsoil heaps and mining area with invader plant species as a result of site establishment

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
3	1	1	1.6	2	2	2	**4**

Potential impact on fauna within the footprint area as a result of site establishment

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
1	2	1	1.3	1	1	1	**1.3**

Dust nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
1	1	1	1	2	3	2.5	**2.5**

Noise nuisance as a result of the mining activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Partial**		
1	2	1	1.3	1	2	1.5	**1.95**

Possible opportunities to local residents **(Positive Impact)**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Medium-High					**Degree of Mitigation: N/A**		
1	2	5	2.6	5	5	5	**13**

MINING OF GRAVEL

Soil contamination from hydrocarbon spills as a result of mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low					**Degree of Mitigation: Full**		
5	1	1	2.3	2	1	1.5	**3.5**

Disturbance to fauna within the footprint area as a result of mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low					**Degree of Mitigation: Full**		
3	1	2	2	2	1	1.5	**3**

Noise nuisance as a result of the mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low					**Degree of Mitigation: Partial**		
3	4	2	3	1	2	1.5	**4.5**

Dust nuisance as a result of the mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low					**Degree of Mitigation: Partial**		
3	4	2	3	1	2	1.5	**4.5**

Potential impact on areas/infrastructure of heritage or cultural concern

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low					**Degree of Mitigation: Full**		
4	4	1	3	1	1	1	**3**

CRUSHING, SCREENING, STOCKPILING AND TRANSPORTING MATERIAL FROM SITE:

Loss of stockpiled material due to ineffective storm water control

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low					**Degree of Mitigation: Full**		
3	4	1	2.6	2	1	1.5	**3.9**

Dust nuisance as a result of the mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low					**Degree of Mitigation: Full**		
3	4	2	3	2	1	1.5	**4.5**

Noise nuisance as a result of the mining activities

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Low					**Degree of Mitigation: Full**		
3	4	2	3	2	1	1.5	**4.5**

Potential impact associated with littering and hydrocarbon spills

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
3	4	1	2.6	2	1	1.5	**3.9**

Infestation of denuded areas with invader plant species

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
3	4	2	3	2	1	1.5	**4.5**

Deterioration of the access road to the mining area

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
2	4	1	2.3	2	2	2	**4.6**

Overloading of trucks having an impact on the public roads

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low-Medium					**Degree of Mitigation: Full**		
4	2	5	3.6	2	1	1.5	**5.4**

SLOPING AND LANDSCAPING UPON CLOSURE OF THE MINING AREA

Erosion of returned topsoil after rehabilitation

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
3	1	2	2	2	1	1.5	**3**

Infestation of the reinstated area with invader plant species

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Full**		
3	2	1	2	2	2	2	**4**

Noise nuisance as a result of the decommissioning activities

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	**Significance**
Rating: Low					**Degree of Mitigation: Partial**		
1	1	2	1.3	1	5	3	**3.9**

Potential impact associated with litter/hydrocarbon spills left at the mining area

			Consequence			Likelihood	**Significance**
Severity	Duration	Extent		Probability	Frequency		
Rating: Medium					**Degree of Mitigation: Full**		
3	1	1	1.7	2	1	1.5	**2.6**

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).

Table 20: Assessment of each identified potentially significant impact and risk

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
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, air pollution, etc…etc…etc.)		In which impact is anticipated. (E.g. Construction, commissioning, operational Decommissioning closure, post closure.)	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) E.g. Modify through alternative method Control through noise control Control through management and monitoring through rehabilitation.	If not mitigated.
• Demarcation of site with visible beacons.	• No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	N/A	Site Establishment phase	N/A	Control through management and monitoring.	N/A
• Site establishment	• Visual intrusion as a result of site establishment.	The visual impact may affect the aesthetics of the landscape.	Site Establishment & Operational Phase	• Low-Medium	<u>Control:</u> Implementing proper housekeeping.	• Low-Medium
• Site establishment • Screening, stockpile, and transporting material from site.	• Loss of topsoil and fertility during mining and stockpiling • Loss of stockpiled material	Loss of topsoil will affect the rehabilitation success upon closure of the mine.	Site Establishment- and Decommissioning phase	• Low • Low-Medium	<u>Control & Remedy:</u> Proper housekeeping and storm water management.	• Low • Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
• Sloping and landscaping upon closure of the mining area.	due to ineffective storm water control. • Erosion of returned topsoil after rehabilitation			• Low-Medium		• Low
• Site establishment • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Infestation of the topsoil heaps and mining area with invader plant species. • Infestation of denuded areas with invader plant species • Infestation of the reinstated area with invader plant species.	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational- and Decommissioning phase	• Low-Medium • Medium • Medium	Control: Implementing soil- and storm water management.	• Low • Low • Low
• Site establishment. • Mining of gravel.	• Potential impact on fauna within the footprint area. • Disturbance to fauna within the footprint area	This will impact on the biodiversity of the receiving environment.	Site Establishment- and Operational phase	• Low-Medium • Low-Medium	Control & Stop: Implementing good management practices.	• Low • Low
• Site establishment • Screening, stockpile, and transporting material from site.	• Dust nuisance as a result of the mining activities. • Dust nuisance as a result of the mining activities.	Increased dust generation will impact on the air quality of the receiving environment.	Site Establishment- and Operational Phase	• Low-Medium • Medium	Control: Dust suppression methods and proper housekeeping.	• Low • Low
• Site establishment • Mining of gravel • Screening, stockpile, and transporting material from site.	• Noise nuisance as a result of the mining activities. • Noise nuisance as a result of the decomissiononig activities.	Should noise levels become excessive it may have an impact on the noise ambiance of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	• Low-Medium • Low	Control: Noise suppression methods and proper housekeeping.	• Low • Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
• Sloping and landscaping upon closure of the mining area.						
• Mining of gravel. • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Soil contamination from hydrocarbon spills. • Potential impact assocaited with littering and hydrocarbon spills. • Potential impact associated with litter left at the mining area.	Contamination of the footprint area will negatively impact the soil, surface runoff and potentially the groundwater. It will also incur additional costs to the permit holder.	Site Establishment-, Operational-, and Decommissioning Phase	• Medium • Medium • Medium	Control & Remedy: Proper housekeeping and implementation of an emergency response plan and waste management plan.	• Low • Low • Low
• Mining of gravel.	• Potential impact on area/infrastructure of heritage or cultural concern.	This could impact on the cultural and heritage legacy of the receiving environment.	Operational Phase	• Low	Control & Stop: Implementing good management practices, as well as the chance-find protocol.	• Low
• Screening, stockpile, and transporting material from site.	• Deterioration of the access road to the mining area.	Collapse of the road infrastructure will affect the landowner.	Operational Phase	• Low-Medium	Control & Remedy: Maintaining the access road for the duration of the operational phase, as well as leaving it in a representative or better condition than prior to mining.	• Low
• Screening, stockpile, and transporting material from site.	• Overloading of truks having an impact on the public roads.	Overloading will negatively affect the roads in the vicinity of the mining area.	Operational Phase	• Medium-High	Control: Proper site management.	• Low-Medium

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

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):-

Table 21: Summary of specialist reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with X if applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
The screening report for an environmental authorisation, as required in terms of the 2014 NEMA EIA Regulations of a portion of the Remaining Extent of the farm Sydenhanm 445, Registration Division of Bloemfontein, Free State province identified the following list of specialist assessment for inclusion in the assessment report: • Agricultural Impact Assessment; • Archaeological and Cultural Heritage Impact Assessment; • Paleontology Impact Assessment; • Terrestrial Biodiversity Impact Assessment; • Aquatic Biodiversity Impact Assessment; • Hydrology Assessment; • Noise Impact Assessment; • Radioactivity Impact Assessment; • Traffic Impact Assessment; • Geotechnical Assessment; • Socio-economic Assessment; • Plant Species Assessment;			

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with X if applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED

- Animal Species Assessment.

Kenrau (Pty) Ltd (hereafter referred to as the applicant) appointed Greenmined Environmental (Pty) Ltd as the environmental impact assessment practitioner (EAP) to undertake the EIA associated with the mining permit application. In light of this Greenmined would like to respond as follows to the list of required specialist studies:

- Agricultural Impact Assessment (AIA):

The Remaining Extent of the farm Sydenhanm 445, Registration Division of Bloemfontein, Free State province was previously used as an existing quarry. The agricultural potential of the farm will be assessed as part of the EIA, however, Greenmined is of the opinion that a specialist AIA is not needed as the application footprint extends into an area previously used for mining purposes. The proposed project will not necessitate the loss of any agricultural field, center pivot or similarly operated agricultural area.

- Archaeological and Cultural Heritage Impact Assessment (HIA) & Paleontology Impact Assessment (PIA):

The proposed mining footprint extends into an area that has previously been used for mining, and therefore no sites of archaeological or cultural importance is expected within the footprint. In light of this, it is proposed that a chance-find protocol be incorporated in the EMPR to be adhered to for the duration of the site establishment-, operational- and decommissioning phases. In our opinion this project does not necessitate an HIA & PIA.

- Terrestrial Biodiversity Impact Assessment (TBIA) & Plant Species Assessment (PSA) & Animal Species Assessment (ASA):

As mentioned earlier, the proposed mining footprint extends into an area that has previously been used for mining. No protected or red data animal or plant species were identified during the site inspection, and no fauna will be impacted by the proposed mining as they will be able to move away or through the site without being harmed. It is proposed that should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the riparian vegetation, groundcover and/or fauna is deemed to be of low significance. Therefore, in light of the site-specific state of the earmarked area there is no need for a TBIA, PSA or ASA.

- Aquatic Biodiversity Impact Assessment (ABIA) & Hydrology Assessment (HA):

The proposed project does not require a Water Use Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No 36 of 1998). As mentioned earlier, the proposed mining footprint extends into an area that has previously been used for mining, and no activity will take place in or within close vicinity of any water bodies.

- Noise Impact Assessment (NIA):

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with X if applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED

The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the machinery already operational at the property. Due to the small scale of the operation a NIA is not deemed applicable.

- Radioactivity Impact Assessment

A radioactivity impact assessment is not deemed necessary for the proposed sand mining operation that will not store any chemicals on site, perform activities of radioactive nature or generate hazardous waste of radioactive nature.

- Traffic Impact Assessment (TIA):

The Applicant will use the existing road to access the mining area and transport material from the mine. The existing road has a formal entrance and was also used by the previous permit holder to transport material. No upgrading of the road is needed prior to commencement. In light of the small scale of the proposed operation a TIA is not deemed necessary, should the Applicant implement the mitigation measures to be proposed in the EMPR.

- Geotechnical Assessment:

No reason for a geotechnical assessment could be identified as no permanent infrastructure will be established at the proposed mining area, and mining will not create a deep void with high faces.

- Socio-economic Assessment (SEA):

The material to be sourced from the mining area will be used for the upgrading of the road infrastructure in the vicinity of the site. The proposed mine will be operated on an area previously used for mining. Should any additional workers to be required on this mining activity they will be sourced from the local community. Workers will daily be transported to the site. The establishment of the mining area on the farm will also assist the property owner in the diversification of their income. In light of this a SEA is not deemed applicable to this project.

In light of the above mentioned, we propose that the no specialist studies are currently deemed applicable to the proposed mining operation.

l) Environmental impact statement

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

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

Project Proposal

Kenrau (Pty) Ltd applied for authorisation to mine gravel from a 5.0 ha area that extends over the previous gravel mining footprint. The proposed mining footprint was restricted to the already disturbed areas on the farm, so as to limit the removal of natural occurring vegetation. The operational phase will involve the recovery of the gravel by means of excavation with earth moving equipment. The material is then loaded and hauled to a crushing and screening plant. The gravel will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the site.

Topography

The natural topography of the area surrounding the proposed gravel mine is best described as slightly undulating bottomland landscape covered with tall, dense grassland alternating with patches of karroid scrub occurring especially over calcrete. The elevation loss from the proposed mining footprint to the town of Bloemfontein is found to be 90 m over 9.42 km.

Visual Characteristics

The viewshed analysis showed that the visual impact of the proposed gravel mining operation will be of low significance. The small scale of the proposed operation, and the mining within an existing excavation area contributes to the low visual significance. Should the Applicant successfully rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine

Air and Noise Quality

The proposed activity will contribute the emissions mechanical mining equipment to the receiving environment for the duration of the operational phase. Should the permit holder implement the mitigation measures proposed in this document and the EMPR the impact on the air quality of the surrounding environment is deemed to be of low significance and compatible with the current land use. The potential impact on

the noise ambiance of the receiving environment is expected to be of low significance and representative of the traffic of the surrounding area.

Geology and Soil

The site specific geology is representative of the regional geology and soil as described earlier in this report. Sedimentary mudstones and layers of sandstone mainly of the Adelaide Subgroup (Beaufort Group, Karoo Supergroup). Volksrust Formation mudstones of the Ecca Group (also Karoo Supergroup) dominate the western part of the area. Deep (>300 mm) layer of red sand (aeolian origin) covers the more clayey B-horizons. Soil forms such as arable Hutton, Bainsvlei and Bloemdal occur here and are typical of the Ca land type. The Ea land type has shallow gravelly soils underlain by dolerite sills. Ca and Ae land types are nearly equally represented.

The gravel of the study area is a coarse gravel and highly suitable for construction purposes. The material to be mined is already in aggregate form, gravel will be excavated by means of earth moving equipment and then loaded and hauled to a crushing and screening plant.

Mining, Biodiversity and Groundcover

Ground-truth showed that the proposed footprint of the mining area is highly disturbed. The Applicant will make use of the existing access point to the mining area. It is proposed that should the Applicant implement the mitigation measures proposed in the EMPr the impact of the proposed activity on the vegetation and groundcover in general is deemed to be of low significance.

Fauna

Various small mammals and reptiles occur on the property. Larger herbivore species are very scares or absent due to the conflicting land use. 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 will be informed and managed to ensure that no fauna at the site is harmed. No poaching or hunting of animals will be allowed. All construction vehicles must adhere to a low speed limit (<40km/h) to avoid collisions with susceptible species such as snakes and tortoises. Trenches and deep excavations must not be left open for extended periods of time as fauna may

fall in and become trapped in them. Trenches which are exposed must contain soil ramps allowing fauna to escape the trench.

Cultural and Heritage Environment

No sites of archaeological or cultural importance were identified during the site inspection, and consultation with the interested and affected parties also did not identify any potential area of concern. The Applicant will implement a chance-find protocol on site for the duration of the site establishment-, operational- and decommissioning phase.

Site Specific Infrastructure

The existing infrastructure within 500m of the proposed mining area includes a connecting road of the N6, the N1 a water reservoir and a flying club. None of the existing infrastructure falls within the site area and will therefore not be affected.

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 C.

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:

- Possible work opportunities to local residents;
- Return of the mining area to agricultural use upon closure of the project; and
- Diversification of the land use of the property.

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

- Visual intrusion as a result of site establishment **Low-Medium**
- Overloading of trucks having an impact on the public roads **Low-Medium**

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.

Table 22: Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
VISUAL CHARACTERISTICS Mitigating the visual impact.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Contain mining to the boundaries of the permitted area. • Ensure that the site have a neat appearance and is kept in good condition at all times. • Limit vegetation removal, and only strip topsoil immediately prior to the use of a specific area. • Rehabilitate and level the site upon closure to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.	• Minimise the impact of the proposed project on the visual characteristics of the receiving environment during the operational phase, and ensure no residual impact remains after closure.
AIR QUALITY Dust management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Control the liberation of dust into the surrounding environment by the use of; inter alia, straw, water spraying and/or environmentally friendly dust-allaying agents that contains no PCB's (e.g. DAS products). • Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Limit speed on the haul roads to 40 km/h to prevent the generation of excess dust. • Minimise areas devoid of vegetation. • Flatten and cover loads to prevent spillage and windblown dust during transportation. • Take weather conditions into consideration upon commencement of daily operations. Limit operations during very windy periods to reduce airborne dust and resulting impacts. • Ensure dust generating activities comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA, 2004 and ASTM D1739 (SANS	• Dust prevention measures are applied to minimise the generation of dust.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		1137:2012). • Implement best practice measures during the stripping of topsoil, loading, and transporting of material from site to minimize potential dust impacts.	
NOISE AMBIANCE Noise mitigation.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• 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 project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996. • Implement best practice measures to minimise potential noise impacts. • Contract a qualified occupational hygienist to quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring must be in accordance with SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA 2004, SANS 10103:2008.	• Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.
GEOLOGY AND SOIL Topsoil management mitigation measures	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Strip and stockpile the upper 300 mm of the soil. • Carefully manage and conserve the topsoil throughout the stockpiling and rehabilitation process. • Ensure topsoil stripping, stockpiling and re-spreading is done in a systematic way. Plan mining in such a way that topsoil is stockpiled for the minimum possible time. • Place topsoil heaps on a levelled area within the mining footprint area. Do not stockpile topsoil in undisturbed areas. • Protect topsoil stockpiles against losses by water and wind erosion. Position stockpiles so as not to be vulnerable to erosion by wind and water. Establishment of plants on the stockpiles will help prevent erosion. • Ensure that topsoil heaps do not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.	• Adequate fertile topsoil is available to rehabilitate the mined area upon closure.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		• Keep temporary stockpiles free of invasive plant species. • Divert storm- and runoff water around the mining area to prevent erosion. • Spread the topsoil evenly over the rehabilitated area, to a depth of 300 mm, upon closure of the site. • Strive to re-instate topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, to that erosion of returned topsoil is minimized. The best time of year is at the end of the rainy season. • Plant and irrigate a cover crop immediately after spreading topsoil to stabilise the soil and protect it from erosion. Fertilise the cover crop for optimum biomass production. Rehabilitation extends until the first cover crop is well established. • Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after reinstatement.	
HYDROLOGY Storm water management.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Divert storm water around the topsoil heaps to prevent erosion. • Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS.	• Impact to the environment caused by storm water discharge is avoided.
GROUNDCOVER Mitigating invader plants.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Implement an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. • Keep all stockpiles (topsoil) free of invasive plant species. • Control declared invader or exotic species on the rehabilitated areas.	• Mining area is kept free of invasive plant species.
FAUNA	Site Manager to ensure compliance with the guidelines as stipulated in	• Ensure no fauna is caught, killed, harmed, sold or played with.	• Disturbance to fauna is minimised.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
Mitigating the fauna component.	the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Instruct workers to report any animals that may be trapped in the working area. • Ensure no snares are set or nests raided for eggs or young.	
CULTURE/HERITAGE Mitigating cultural/heritage aspects.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Confine all mining to the development footprint area. • Implement the following change find procedure when discoveries are made on site: ▪ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ▪ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area. ▪ The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify SAHRA. ▪ Work may only continue once the go-ahead was issued by SAHRA.	• Impact to cultural/heritage resources is avoided or at least minimised.
EXISTING INFRASTRUCTURE Control of access road.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Divert storm water around the access road to prevent erosion. • Restrict vehicular movement to the existing access road to prevent crisscrossing of tracks through undisturbed areas. • Repair rutting and erosion of the access road caused as a direct result of the mining activities. • Prevent the overloading of the trucks, and file proof of load weights for auditing purposes.	• The access road remains accessible to the road users during the operational phase, and upon closure the road is returned in a better, or at least the same state as received by the permit holder.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
GENERAL Waste management	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Ensure regular vehicle maintenance, repairs and services take place in a demarcated service area of the permit holder. If emergency repairs are needed on equipment not able to move to the workshop / service area, 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 workshop in order to ensure proper disposal. • Provide ablution facilities in the form of a chemical toilet that is placed outside the 1:100 year floodline of any open water resource. Ensure the toilet is serviced at least once every two weeks for the duration of the mining activities. • Ensure that the use of any temporary, chemical toilet facilities does not cause any pollution to water sources or pose a health hazard. In addition, ensure that no form of secondary pollution arise from the disposal of refuse or sewage from the temporary, chemical toilets. Address any pollution problems arising from the above immediately. • Equip the diesel bowser with a drip tray if used on site. The nozzle of the bowser must rest in a sleeve to prevent dripping after refuelling. • Clean drip trays after use. Do not use dirty drip trays. • Keep a spill kit 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 recognized facility. • Collect the contaminated soil from spillage that occurred, such as oil or diesel leaking from a burst pipe, within the first hour of occurrence, in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. File proof. • Compile a waste management plan and implement it on site. The plan must focus on the waste hierarchy of the NEM:WA.	• Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.

MANAGEMENT OBJECTIVES	ROLE	MANAGEMENT ACTION	MANAGEMENT OUTCOME
		• Contain general waste in marked, sealable, refuse bins placed at a designated area and remove waste from the mining area to a recognised general waste landfill site. • Prevent the burning or burying of waste on site. • Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to the Department of Water and Sanitation and other relevant authorities. • Park the machinery at the mining area with drip trays placed underneath stationary vehicles.	
GENERAL Health and safety aspects.	Site Manager to ensure compliance with the guidelines as stipulated in the EMPR. Compliance to be monitored by the Environmental Control Officer.	• Ensure adequate ablution facilities and water for human consumption is daily available on site. • Ensure that workers have access to the correct PPE as required by law. • Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	• Employees work in a healthy and safe environment.

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 *Part A(1)(m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR* 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 site inspections, desktop studies as well as the specialist study. No uncertainty regarding the proposed project or the receiving environment could be identified.

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

i) Reasons why the activity should be 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 *Part A(1)(m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPR* 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 five-year period to correspond with the validity of the mining permit.

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 R 405 245.68. Please see the explanation as to how this amount was derived at attached as Appendix H – Financial and Technical Competence Report.

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).

Kenrau (Pty) Ltd will be responsible for the financial and technical aspects of the proposed mining project. The operating expenditure is provided for as such in the Financial and Technical Competence Report attached as Appendix H to this report.

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

- **Visual intrusion associated with the proposed mining activities:**

  The viewshed analysis showed that the visual impact of the proposed gravel mining operation will be of low significance, especially as no permanent structures will be constructed. The small scale of the proposed operation, and the mining within an existing excavation area contributes to the low visual significance. Should the Applicant successfully rehabilitate the mining area (upon closure), no residual visual impact is expected upon closure of the mine.

- **Dust nuisance caused as a result of the proposed mining activities:**

  The proposed activity will contribute the emissions mechanical mining equipment to the receiving environment for the duration of the operational phase. Should the permit holder implement the mitigation measures proposed in this document and the EMPR the impact on the air quality of the surrounding environment is deemed to be of low significance and compatible with the current land use.

- **Noise nuisance as a result of mining activities:**

  The potential impact on the noise ambiance of the receiving environment is expected to be of low significance and representative of the traffic of the surrounding area. The distance of the proposed mining area from residential infrastructure further lessens the potential noise impact.

- **Employment opportunities and socio-economic impact:**

  The proposed labour component of the activity will be four employees. The operation will contribute to the local economy in the area, both directly and through the multiplier effect that its continued presence will create.

  Equipment and supplies will be purchased locally, and wages are spent at local businesses, generating both jobs and income in the area. Although the employees are not resident on the site, they will be from the surrounding community.

(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).

No sites or artefacts classified as national estate as referred to in section 3(2) of the NHRA, 1999 were identified within the footprint of the proposed mining area.

The proposed mining area is an area previously used for gravel mining. The existing access road and entrance to the site will be used, and no areas of

cultural or heritage importance could be identified that will be affected by the proposed activity.

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)

Site Alternative 1, as discussed earlier, was identified during the assessment phase of the environmental impact assessment by the Applicant and project team, as the preferred and only viable site alternative. The Applicant will recover the gravel by means of mechanical excavation with earthmoving equipment, crush, screen, and store it at the proposed mining area.

The no-go alternative entails no change to the status quo and is therefore a real alternative that must be considered. The gravel to be mined at the site will be used in the building and construction industries, if however, the no-go alternative is implemented the Applicant will not be able to utilise the mineral present in the area.

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 Sonette Smit of Greenmined Environmental that acts as EAP on this project has been included in Part A Section 1(a) as well as Appendix L 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 C to this document.

d) Description of impact management objectives including management statements

i) Determination of closure objectives.

(Ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The end objective is for the mining area to return to agricultural use. No buildings/infrastructure, other than the chemical toilet, crushing and screening plant, need to be demolished and the access road will remain intact to be used by the landowner.

The decommissioning activities will consist of the following:

- Removal of all mining machinery from the mining area;
- Removal/levelling of all stockpiled material;
- Landscaping the mining area, and replacing the topsoil (if previously removed);
- Vegetating the reinstated area; and

- Controlling the invasive plant species.

The Applicant will comply with the minimum closure objectives as prescribed DMRE and detailed below:

- Rehabilitation of the Excavated Area:

  The excavated area must serve as a final depositing area for the placement of overburden. Rocks and coarse material removed from the excavation must be dumped into the excavation.

  No waste may be permitted to be deposited in the excavations.

  Once overburden, rocks and coarse natural materials has been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.

  The area must be fertilized if necessary 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, should natural vegetation not re-establish within 6 months from closure of the site.

  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 the Mining area:

  The gravel screen, chemical toilet and stockpiled material will be removed from the mining area. Compacted areas will be ripped and landscaped and previously stockpiled topsoil will be reinstated. The reinstated area will be seeded with a locally adapted grassmix, and invasive plant species will be controlled for at least one growth seasons. The reinstated area will be monitored for signs of erosion until the cover crop established.

- Final Rehabilitation:

  Final rehabilitation of the surface area shall entail landscaping, levelling, maintenance, and clearing of invasive plant species. All equipment, plant and other items used during the mining period will be removed from site (section 44 of the MPRDA, 2002). Waste material of any description 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. The management of invasive plant species will be done in a sporadic manner during the life of the mining activities. Species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto) will be eradicated from the site. Final rehabilitation shall be completed within a period specified by the Regional Manager.

ii) Volume and rate of water use required for the operation

As no gravel washing is proposed for this project, the Applicant will exclusively use water for dust suppression purposes on the access road when needed. Approximately 5 000 litre water/day will be needed during the dry months. The water will be bought and transported to the mining area in a water truck that will moisten the problem area.

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

As no gravel washing is proposed for this project, the Applicant will exclusively use water for dust suppression purposes on the access road when needed. Approximately 5 000 litre water/day will be needed during the dry months. The water will be bought and transported to the mining area in a water truck that will moisten the problem area and therefore the proposed project does not trigger the NWA, 1998 and no additional water use licence is needed.

iv) Impacts to be mitigated in their respective phases

Table 23: Impact to be mitigated in their respective phases

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	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.	Site Establishment phase	5.0 ha	Demarcation of the site will ensure that all employees are aware of the boundaries of the mining area, and that work stay within the approved area.	Mining of gravel is only allowed within the boundaries of the approved area. • MPRDA, 2008 • NEMA, 1998	Beacons need to be in place throughout the life of the activity.
• Site establishment	Site Establishment & Operational Phase	5.0 ha	**Visual Mitigation** • Mining must be contained to the boundaries of the permitted area. • The site must have a neat appearance and be kept in good condition at all times. • The permit holder must limit vegetation	Management of the mining area must be in accordance with the: • MPRDA, 2008 • NEMA, 1998	Throughout the site establishment-, and operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			removal (if applicable), and stripping of topsoil may only be done immediately prior to the use of a specific area. • Upon closure the mining area must be rehabilitated and levelled to remove the visual impact on the aesthetic value of the area.		
• Site establishment	Site Establishment phase	±5 ha	**Impact on Critical Biodiversity Area:** • The mining boundaries must be clearly demarcated and all operations must be contained to the approved mining area. • The area outside the mining boundaries must be declared a no-go area, and all employees must be educated accordingly. • The invasive plant species management plan attached as Appendix I must be implement on site to control weeds and invasive plants on denuded areas, topsoil heaps and reinstated areas.	Natural vegetated areas must be managed in accordance with the: • NEM:BA 2004 • Free State Biodiversity Plan	Throughout the site establishment phase.
• Site establishment. • Sloping and landscaping upon closure of the mining area.	Site Establishment- and Decommissioning phase	±5 ha	**Topsoil Management:** • The upper 300 mm of the soil must be stripped and stockpiled. • Topsoil is a valuable and essential resource for rehabilitation and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes. • Topsoil stripping, stockpiling and re-spreading must be done in a systematic way. The mining plan have to be such that topsoil is stockpiled for the minimum possible time. • The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas.	Topsoil must be managed in accordance with the: • CARA, 1983 • NEM:BA, 2004 • MPRDA, 2008	Throughout the site establishment-, operational, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• Topsoil stockpiles must be protected against losses by water and wind erosion. Stockpiles must be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion. • Topsoil heaps may not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen. • The temporary topsoil stockpiles must be kept free of invasive plant species. • Storm- and runoff water must be diverted around the mining area to prevent erosion. • The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site. • The permit holder must strive to re-instate topsoil at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, before vegetation is established, is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal. • A cover crop must be planted, irrigated and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass production. It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			crop is well established. • The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.		
• Site establishment. • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	Site Establishment-, Operational- and Decommissioning phase	±1 ha	**Management of Invader Plant Species:** • An invasive plant species management plan (Appendix I) must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities. • All stockpiles (topsoil) must be kept free of invasive plant species. • Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used: ▪ The plants can be uprooted, felled or cut off and can be destroyed completely. ▪ The plants can be treated chemically by a registered pest control officer (PCO) through the use of an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.	Invader plants must be managed in accordance with the: • CARA, 1983 • NEM:BA 2004 • Invasive Plant Species Management Plan (Appendix I)	Throughout the site establishment-, operational, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
• Site establishment. • Mining of gravel.	Site Establishment- and Operational phase	5.0 ha	**Protection of Fauna:** • The site manager must ensure 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.	Fauna must be managed in accordance with the: • NEM:BA 2004	Throughout the site establishment-, and operational phase.
• Site establishment. • Screening, stockpile, and transporting material from site.	Site Establishment-, Operational Phase	±1 ha	**Fugitive Dust Emission Mitigation:** • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, straw, water spraying and/or environmentally friendly dust-allaying agents that contains no PCB's (e.g. DAS products). • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access road must be limited to 40 km/h to prevent the generation of excess dust. • Areas devoid of vegetation, which could act as a dust source, must be minimized and vegetation removal may only be done immediately prior to mining. • Loads must be flattened and covered to ensure that minimal spillage of material takes place during transportation, also preventing windblown dust. • Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and	Dust generation must be managed in accordance with the: • NEM:AQA. 2004 Regulation 6(1) • National Dust Control Regulations, GN No R827 • ASTM D1739 (SANS 1137:2012)	Throughout the site establishment-, operational, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			resulting impacts. • All dust generating activities shall comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA (Act 39 of 2004) and ASTM D1739 (SANS 1137:2012). • Best practice measures shall be implemented during the stripping of topsoil, loading, and transporting of the gravel from site to minimize potential dust impacts.		
• Site establishment. • Mining of gravel. • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	Site Establishment-, Operational-, and Decommissioning Phase	5.0 ha	**Noise Handling:** • The permit holder must ensure that employees and staff conduct themselves in an acceptable manner while on site. • 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 National Road Traffic Act, 1996 (Act No 93 of 1996). • Best practice measures shall be implemented in order to minimize potential noise impacts. • A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008.	Noise generation must be managed in accordance with the: • NEM:AQA. 2004 Regulation 6(1) • NRTA, 1996	Throughout the site establishment-, operational-, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
• Mining of gravel. • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	Site Establishment-, Operational-, and Decommissioning Phase	5.0 ha	**Waste Management:** • Regular vehicle maintenance, repairs and services may only take place in a demarcated service area of the permit holder. If emergency repairs are needed on equipment not able to move to the workshop / service area, 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 workshop in order to ensure proper disposal. • Ablution facilities must be provided in the form of a chemical toilet. The chemical toilet must be placed outside the 1:100 year floodline of any open water resource, and must be serviced at least once every two weeks for the duration of the mining activities. • The use of any temporary, chemical toilet facilities may not cause any pollution to water sources or pose a health hazard. In addition, no form of secondary pollution should arise from the disposal of refuse or sewage from the temporary, chemical toilets. Any pollution problems arising from the above are to be addressed immediately by the permit holder. • If a diesel bowser is used on site, it must be equipped with a drip tray at all times. Drip trays must be used during each and every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. • Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site.	Mining related waste must be managed in accordance with the: • NWA, 1998 • NEM:WA, 2008 • NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) • NEMA, 1998 (Section 30)	Throughout the site establishment-, operational-, and decommissioning phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
			• A spill kit must be available on-site which can be operated by trained employees for the adhoc remediation of minor chemical and hydrocarbon spillages. • 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. • Should spillage occur, such as oil or diesel leaking from a burst pipe, the contaminated soil must, within the first hour of occurrence, be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. Proof must be filed. • A waste management plan must be compiled by site management and implemented on site. The plan must focus on the waste hierarchy of the NEM:WA. • General waste must be contained in marked, sealable, refuse bins placed at a designated area, to be removed when filled to capacity to a recognised general waste landfill site. • No waste may be buried or burned on the site. • No chemicals or hazardous materials may be stored at the mining area. • It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities.		

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
• Mining of gravel.	Operational Phase	±1.6 ha	**Archaeological, Heritage and Palaeontological Aspects:** • All mining must be confined to the development footprint area. • If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. • It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area. • The senior on-site Manager must inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who must notify SAHRA. • Work may only continue once the go-ahead was issued by SAHRA.	Cultural/heritage aspects must be managed in accordance with the: • NHRA, 1999	Throughout the operational phase.
• Mining of gravel. • Crushing, screening, stockpiling and transporting material from	Operational Phase	5.0 ha	**Storm Water Mitigation:** • Storm water must be diverted around the topsoil heaps and mining area to prevent erosion. • Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control	Storm water must be managed in accordance with the: • CARA, 1983 • NEMA, 1998 • NWA, 1998	Throughout the operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
site.			and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose: ▪ Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. You must prevent clean water from running or spilling into dirty water systems. ▪ Dirty water must be collected and contained in a system separate from the clean water system. ▪ Dirty water must be prevented from spilling or seeping into clean water systems. ▪ The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into a storm water management plan.		
Crushing, screening, stockpiling and transporting material from site.	Operational Phase	±1 ha	**<u>Access Road Mitigation:</u>** Storm water must be diverted around the access road to prevent erosion. Vehicular movement must be restricted to the existing access road to prevent crisscrossing of tracks through undisturbed areas. Rutting and erosion of the access road caused as a direct result of the mining activities must be repaired by the permit holder. Overloading of the truck must be prevented, and proof of load weights must be filed for auditing purposes.	The access road must be managed in accordance with the: NRTA, 1996	Throughout the operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
• Site establishment. • Mining of gravel. • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	Site Establishment-, Operational-, and Decommissioning phase	5.0 ha	**Management of Health and Safety Risks:** • Adequate ablution facilities and water for human consumption must daily be available on site. • Workers must have access to the correct personal protection equipment (PPE) as required by law. • All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	Health and safety aspects must be managed in accordance with the: • MHSA, 1996 • OHSA, 1993 • OHSAS, 18001	Throughout the site establishment-, operational and decommissioning phase.

e) Impact Management Outcomes

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

Table 24: Impact Management Outcomes

ACTIVITY 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.)	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure))	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc..) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation.	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
• Demarcation of site with visible beacons.	• No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	N/A	Site Establishment phase	Control through management and monitoring.	Mining of gravel is only allowed within the boundaries of the approved area. • MPRDA, 2008 • NEMA, 1998
• Site establishment	• Visual intrusion as a result of site establishment.	The visual impact may affect the aesthetics of the landscape.	Site Establishment & Operational Phase	<u>Control:</u> Implementing proper housekeeping.	Management of the mining area must be in accordance with the: • MPRDA, 2008 • NEMA, 1998
• Site establishment • Crushing, screening, stockpiling and transporting	• Loss of topsoil and fertility during mining and stockpiling	Loss of topsoil will affect the rehabilitation success upon	Site Establishment- and Decommissioning phase	<u>Control & Remedy:</u> Proper housekeeping and storm water management.	Topsoil must be managed in accordance with the: • CARA, 1983 • NEM:BA, 2004

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
material from site. • Sloping and landscaping upon closure of the mining area.	• Loss of stockpiled material due to ineffective storm water control. • Erosion of returned topsoil after rehabilitation	closure of the mine.			• MPRDA, 2008
• Site establishment • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Infestation of the topsoil heaps and mining area with invader plant species. • Infestation of denuded areas with invader plant species • Infestation of the reinstated area with invader plant species.	This will impact on the biodiversity of the receiving environment.	Site Establishment-, Operational- and Decommissioning phase	<u>Control:</u> Implementing soil- and storm water management.	Invader plants must be managed in accordance with the: • CARA, 1983 • NEM:BA 2004 • Invasive Plant Species Management Plan (Appendix I)
• Site establishment. • Mining of gravel.	• Potential impact on fauna within the footprint area. • Disturbance to aquatic fauna within the footprint area	This will impact on the biodiversity of the receiving environment.	Site Establishment- and Operational phase	<u>Control & Stop:</u> Implementing good management practices.	Fauna must be managed in accordance with the: • NEM:BA 2004
• Site establishment • Screening, stockpile, and transporting material from site.	• Dust nuisance as a result of the mining activities.	Increased dust generation will impact on the air quality of the	Site Establishment- and Operational Phase	<u>Control:</u> Dust suppression methods and proper housekeeping.	Dust generation must be managed in accordance with the: • NEM:AQA. 2004 Regulation 6(1)

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	• Dust nuisance as a result of the mining activities.	receiving environment.			• National Dust Control Regulations, GN No R827 • ASTM D1739 (SANS 1137:2012)
• Site establishment • Mining of gravel • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Noise nuisance as a result of the mining activities. • Noise nuisance as a result of the decomissiononig activities.	Should noise levels become excessive it may have an impact on the noise ambiance of the receiving environment.	Site Establishment-, Operational-, and Decommissioning Phase	<u>Control:</u> Noise suppression methods and proper housekeeping.	Noise generation must be managed in accordance with the: • NEM:AQA. 2004 Regulation 6(1) • NRTA, 1996
• Mining of gravel. • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Soil contamination from hydrocarbon spills. • Potential impact assocaited with littering and hydrocarbon spills. • Potential impact associated with litter left at the mining area.	Contamination of the footprint area will negatively impact the soil, surface runoff and potentially the groundwater. It will also incur additional costs to the permit holder.	Site Establishment-, Operational-, and Decommissioning Phase	<u>Control & Remedy:</u> Proper housekeeping and implementation of an emergency response plan and waste management plan.	Mining related waste must be managed in accordance with the: • NWA, 1998 • NEM:WA, 2008 • NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) • NEMA, 1998 (Section 30)
• Mining of gravel.	• Potential impact on area/infrastructure of heritage or cultural concern.	This could impact on the cultural and heritage legacy of the receiving environment.	Operational Phase	<u>Control & Stop:</u> Implementing good management practices, as well as the chance-find protocol.	Cultural/heritage aspects must be managed in accordance with the: • NHRA, 1999
• Screening, stockpile, and	• Deterioration of the	Collapse of the road	Operational Phase	<u>Control & Remedy:</u> Maintaining the access	The access road must be managed

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
transporting material from site.	access road to the mining area.	infrastructure will affect the landowner.		road for the duration of the operational phase, as well as leaving it in a representative or better condition than prior to mining.	in accordance with the: • NRTA, 1996
• Screening, stockpile, and transporting material from site.	• Overloading of trucks having an impact on the public roads.	Overloading will negatively affect the roads in the vicinity of the mining area.	Operational Phase	Control: Proper site management.	Load weights must be managed in accordance with the: • NRTA, 1996

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)

Table 25: Impact Management Actions

ACTIVITY 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.)	**POTENTIAL IMPACT** (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc..)	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc... etc.) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation.	**TIME PERIOD FOR IMPLEMENTATION** 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.	**COMPLIANCE WITH STANDARDS** (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)
▪ Demarcation of site with visible beacons.	▪ No impact could be identified other than the beacons being outside the boundaries of the approved mining area.	Demarcation of the site will ensure that all employees are aware of the boundaries of the mining area, and that work stay within the approved area.	Beacons need to be in place throughout the life of the activity.	Mining of gravel is only allowed within the boundaries of the approved area. ▪ MPRDA, 2008 ▪ NEMA, 1998
▪ Site establishment	▪ Visual intrusion as a result of site establishment.	**<u>Visual Mitigation</u>** ▪ Mining must be contained to the boundaries	Throughout the site establishment-, and	Management of the mining area must be in accordance with the:

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		of the permitted area. • The site must have a neat appearance and be kept in good condition at all times. • The permit holder must limit vegetation removal (if applicable), and stripping of topsoil may only be done immediately prior to the use of a specific area. • Upon closure the mining area must be rehabilitated and levelled to remove the visual impact on the aesthetic value of the area.	operational phase.	• MPRDA, 2008 • NEMA, 1998
• Site establishment • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Loss of topsoil and fertility during mining and stockpiling • Loss of stockpiled material due to ineffective storm water control. • Erosion of returned topsoil after rehabilitation	**<u>Topsoil Management:</u>** • The upper 300 mm of the soil must be stripped and stockpiled. • Topsoil is a valuable and essential resource for rehabilitation and it must therefore be managed carefully to conserve and maintain it throughout the stockpiling and rehabilitation processes. • Topsoil stripping, stockpiling and re-spreading must be done in a systematic way. The mining plan have to be such that topsoil is stockpiled for the minimum possible time. • The topsoil must be placed on a levelled area, within the mining footprint. No topsoil may be stockpiled in undisturbed areas. • Topsoil stockpiles must be protected against losses by water and wind erosion. Stockpiles must be positioned so as not to be vulnerable to erosion by wind and water. The establishment of plants (weeds or a cover crop) on the stockpiles will help to prevent erosion.	Throughout the site establishment-, operational, and decommissioning phase.	Topsoil must be managed in accordance with the: • CARA, 1983 • NEM:BA, 2004 • MPRDA, 2008

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• Topsoil heaps may not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen. • The temporary topsoil stockpiles must be kept free of invasive plant species. • Storm- and runoff water must be diverted around the mining area to prevent erosion. • The stockpiled topsoil must be evenly spread, to a depth of 300 mm, over the rehabilitated area upon closure of the site. • The permit holder must strive to re-instate topsoil at a time of year when vegetation cover can be established as quickly as possible afterwards, so that erosion of returned topsoil by both rain and wind, before vegetation is established, is minimized. The best time of year is at the end of the rainy season, when there is moisture in the soil for vegetation establishment and the risk of heavy rainfall events is minimal. • A cover crop must be planted, irrigated and established immediately after spreading of topsoil, to stabilize the soil and protect it from erosion. The cover crop must be fertilized for optimum biomass production. It is important that rehabilitation be taken up to the point of cover crop stabilization. Rehabilitation cannot be considered complete until the first cover crop is well established. • The rehabilitated area must be monitored for erosion, and appropriately stabilized if any erosion occurs for at least 12 months after reinstatement.		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
• Site establishment • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Infestation of the topsoil heaps and mining area with invader plant species. • Infestation of denuded areas with invader plant species • Infestation of the reinstated area with invader plant species.	**Management of Invader Plant Species:** • An invasive plant species management plan (Appendix I) must be implemented at the site to ensure the management and control of all species regarded as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto). Weed/alien clearing must be done on an ongoing basis throughout the life of the mining activities. • All stockpiles (topsoil) must be kept free of invasive plant species. • Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used: ▪ The plants can be uprooted, felled or cut off and can be destroyed completely. ▪ The plants can be treated chemically by a registered pest control officer (PCO) through the use of an herbicide recommended for use by the PCO in accordance with the directions for the use of such an herbicide.	Throughout the site establishment-, operational, and decommissioning phase.	Invader plants must be managed in accordance with the: • CARA, 1983 • NEM:BA 2004 • Invasive Plant Species Management Plan (Appendix I)
• Site establishment. • Mining of gravel.	• Potential impact on fauna within the footprint area. • Disturbance to aquatic fauna within the footprint area	**Protection of Fauna:** • The site manager must ensure 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.	Throughout the site establishment-, and operational phase.	Fauna must be managed in accordance with the: • NEM:BA 2004

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
• Site establishment • Screening, stockpile, and transporting material from site.	• Dust nuisance as a result of the mining activities. • Dust nuisance as a result of the mining activities.	**<u>Fugitive Dust Emission Mitigation:</u>** • The liberation of dust into the surrounding environment must be effectively controlled by the use of, inter alia, straw, water spraying and/or environmentally friendly dust-allaying agents that contains no PCB's (e.g. DAS products). • The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Speed on the access road must be limited to 40 km/h to prevent the generation of excess dust. • Areas devoid of vegetation, which could act as a dust source, must be minimized and vegetation removal may only be done immediately prior to mining. • Loads must be flattened and covered to ensure that minimal spillage of material takes place during transportation, also preventing windblown dust. • Weather conditions must be taken into consideration upon commencement of daily operations. Limiting operations during very windy periods would reduce airborne dust and resulting impacts. • All dust generating activities shall comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA (Act 39 of 2004) and ASTM D1739 (SANS 1137:2012). • Best practice measures shall be implemented during the stripping of topsoil, loading, and transporting of the gravel from site to minimize potential dust impacts.	Throughout the site establishment-, operational, and decommissioning phase.	Dust generation must be managed in accordance with the: • NEM:AQA. 2004 Regulation 6(1) • National Dust Control Regulations, GN No R827 • ASTM D1739 (SANS 1137:2012)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
• Site establishment • Mining of gravel • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Noise nuisance as a result of the mining activities. • Noise nuisance as a result of the decomissiononig activities.	**Noise Handling:** • The permit holder must ensure that employees and staff conduct themselves in an acceptable manner while on site. • 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 National Road Traffic Act, 1996 (Act No 93 of 1996). • Best practice measures shall be implemented in order to minimize potential noise impacts. • A qualified occupational hygienist must be contracted to quarterly monitor and report on the personal noise exposure of the employees working at the mine. The monitoring must be done in accordance with the SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA, 2004, SANS 10103:2008.	Throughout the site establishment-, operational-, and decommissioning phase.	Noise generation must be managed in accordance with the: • NEM:AQA. 2004 Regulation 6(1) • NRTA, 1996
• Mining of gravel. • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Soil contamination from hydrocarbon spills. • Potential impact assocaited with littering and hydrocarbon spills. • Potential impact associated with litter left at the mining area.	**Waste Management:** • Regular vehicle maintenance, repairs and services may only take place in a demarcated service area of the permit holder. If emergency repairs are needed on equipment not able to move to the workshop / service area, 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 workshop in order to ensure proper disposal. • Ablution facilities must be provided in the form of a chemical toilet. The chemical	Throughout the site establishment-, operational-, and decommissioning phase.	Mining related waste must be managed in accordance with the: • NWA, 1998 • NEM:WA, 2008 • NEM:WA, 2008: National norms and standards for the storage of waste (GN 926) • NEMA, 1998 (Section 30)

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		toilet must be placed outside the 1:100 year floodline of any open water resource, and must be serviced at least once every two weeks for the duration of the mining activities. • The use of any temporary, chemical toilet facilities may not cause any pollution to water sources or pose a health hazard. In addition, no form of secondary pollution should arise from the disposal of refuse or sewage from the temporary, chemical toilets. Any pollution problems arising from the above are to be addressed immediately by the permit holder. • If a diesel bowser is used on site, it must be equipped with a drip tray at all times. Drip trays must be used during each and every refuelling event. The nozzle of the bowser needs to rest in a sleeve to prevent dripping after refuelling. • Site management must ensure drip trays are cleaned after each use. No dirty drip trays may be used on site. • A spill kit must be available on-site which can be operated by trained employees for the adhoc remediation of minor chemical and hydrocarbon spillages. • 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. • Should spillage occur, such as oil or diesel leaking from a burst pipe, the contaminated soil must, within the first hour of occurrence, be collected in a suitable receptacle and removed from the site,		

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		either for resale or for appropriate disposal at a recognized facility. Proof must be filed. • A waste management plan must be compiled by site management and implemented on site. The plan must focus on the waste hierarchy of the NEM:WA. • General waste must be contained in marked, sealable, refuse bins placed at a designated area, to be removed when filled to capacity to a recognised general waste landfill site. • No waste may be buried or burned on the site. • No chemicals or hazardous materials may be stored at the mining area. • It is important that any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities is reported to the Department of Water and Sanitation and other relevant authorities.		
• Mining of gravel.	• Potential impact on area/infrastructure of heritage or cultural concern.	**Archaeological, Heritage and Palaeontological Aspects:** • All mining must be confined to the development footprint area. • If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.	Throughout the operational phase.	Cultural/heritage aspects must be managed in accordance with the: • NHRA, 1999

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		• It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area. • The senior on-site Manager must inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who must notify SAHRA. • Work may only continue once the go-ahead was issued by SAHRA.		
• Crushing, screening, stockpiling and transporting material from site. • Mining of gravel.	• Loss of stockpiled material due to ineffective storm water control.	**<u>Storm Water Mitigation:</u>** • Storm water must be diverted around the topsoil heaps and mining area to prevent erosion. • Mining must be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose: ▪ 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	Throughout the operational phase.	Storm water must be managed in accordance with the: • CARA, 1983 • NEMA, 1998 • NWA, 1998

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		spilling or seeping into clean water systems.		
• Screening, stockpile, and transporting material from site.	• Deterioration of the access road to the mining area. • Overloading of trucks having an impact on the public roads.	**Access Road Mitigation:** • Storm water must be diverted around the access road to prevent erosion. • Vehicular movement must be restricted to the existing access road to prevent crisscrossing of tracks through undisturbed areas. • Rutting and erosion of the access road caused as a direct result of the mining activities must be repaired by the permit holder. • Overloading of the truck must be prevented, and proof of load weights must be filed for auditing purposes.	Throughout the operational phase.	The access road must be managed in accordance with the: • NRTA, 1996
• Site establishment. • Mining of gravel. • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Potential health and safety risk to employees.	**Management of Health and Safety Risks:** • Adequate ablution facilities and water for human consumption must daily be available on site. • Workers must have access to the correct personal protection equipment (PPE) as required by law. • All operations must comply with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	Throughout the site establishment-, operational and decommissioning phase.	Health and safety aspects must be managed in accordance with the: • MHSA, 1996 • OHSA, 1993 • OHSAS, 18001

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 closure objectives entail removing the mining machinery from the site. Removal of the crushing and screening plant, containers, weighbridge and chemical toilet from the mining area, removal/levelling of all stockpiled material and the landscaping of the mining area to allow the replacement of stockpiled topsoil. The reinstated area will be vegetated and invasive plant species will be controlled during a 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 DMRE.

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

This report, the Draft Basic Assessment Report, includes all the environmental objectives in relation to closure and will be made available for perusal by the landowner, registered I&AP's and stakeholders over a 30-days commenting period.

(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 E.

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

The decommissioning phase will entail the final rehabilitation of the mining site. Final landscaping, levelling and top dressing will be done. The rehabilitation of the mining area as indicated on the rehabilitation plan attached as Appendix E will comply with the minimum closure objectives as prescribed by DMRE and detailed below, and therefore is deemed to be compatible:

- Rehabilitation of the Excavated Area:

  The risk of unsloped and unrehabilitated areas posing a safety risk can be reduced to being Low through the implementation of the mitigation measures listed below:

  - The excavated area must serve as a final depositing area for the placement of overburden.
  - Rocks and coarse material removed from the excavation must be dumped into the excavation.
  - No waste may be permitted to be deposited in the excavations.
  - Once overburden, rocks and coarse natural materials have been added to the excavation and it was profiled with acceptable contours and erosion control measures, the topsoil previously stored must be returned to its original depth over the area.
  - The area must be fertilized if necessary 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, should natural vegetation not re-establish within 6 months from closure of the site. Seeds should be harvested prior to commencement of the mining activities and indigenous vegetation or a suitable crop should be reintroduced during the rehabilitation process;
  - Where re-vegetation work will be done on the disturbed areas, only suitable crops, or locally indigenous, endemic vegetation must be used, and no “alien Plant” species are allowed.
  - 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 the Mining area:

  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 site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- Photographs of the office sites and workshop, 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 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:

Final rehabilitation of the surface area shall entail landscaping, levelling, maintenance, and clearing of invasive plant species. All equipment, plant and other items used during the mining period will be removed from site (section 44 of the MPRDA, 2002). Waste material of any description 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. The management of invasive plant species will be done in a sporadic manner during the life of the mining activities. Species regarded

as Category 1a and 1b invasive species in terms of NEM:BA (National Environmental Management: Biodiversity Act 10 of 2004 and regulations applicable thereto) will be eradicated from the site. Final rehabilitation shall be completed within a period specified by the Regional Manager.

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

The calculation of the quantum for financial provision was according to Section B of the working manual.

Mine type and saleable mineral by-product

According to Tables B.12, B.13 and B.14

Mine type	Gravel
Saleable mineral by-product	None

Risk ranking

According to Tables B.12, B.13 and B.14

Primary risk ranking (either Table B.12 or B.13)	C (Low risk).
Revised risk ranking (B.14)	N/A

Environmental sensitivity of the mine area

According to Table B.4

Environmental sensitivity of the mine area	Low

Level of information

According to Step 4.2:

Level of information available	Limited

Identify closure components

According to Table B.5 and site-specific conditions

Component No.	Main description	Applicability of closure components (Circle Yes or No)	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	NO
2(A)	Demolition of steel buildings and structures	-	NO
2(B)	Demolition of reinforced concrete buildings and structures	-	NO
3	Rehabilitation of access roads	-	NO
4(A)	Demolition and rehabilitation of electrified railway lines	-	NO
4(B)	Demolition and rehabilitation of non-electrified railway lines	-	NO
5	Demolition of housing and facilities	-	NO
6	Opencast rehabilitation including final voids and ramps	YES	
7	Sealing of shafts, adits and inclines	-	NO
8(A)	Rehabilitation of overburden and spoils	-	NO
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing)	-	NO
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich)	-	NO
9	Rehabilitation of subsided areas	-	NO
10	General surface rehabilitation, including grassing of all denuded areas	YES	-
11	River diversions	-	NO
12	Fencing	-	NO
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)	-	NO
14	2 to 3 years of maintenance and aftercare	YES	

Unit rates for closure components

According to Table B.6 master rates and multiplication factors for applicable closure components.

Component No.	Main description	Master rate	Multiplication factor
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	-	-
2(A)	Demolition of steel buildings and structures	-	-
2(B)	Demolition of reinforced concrete buildings and structures	-	-
3	Rehabilitation of access roads	-	-
4(A)	Demolition and rehabilitation of electrified railway lines	-	-
4(B)	Demolition and rehabilitation of non-electrified railway lines	-	-
5	Demolition of housing and facilities	-	-
6	Opencast rehabilitation including final voids and ramps	253 019	0.5-
7	Sealing of shafts, adits and inclines	-	-
8(A)	Rehabilitation of overburden and spoils	168 679	-
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	126 059	1.00
11	River diversions	-	-

Component No.	Main description	Master rate	Multiplication factor
12	Fencing	-	-
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)	-	-
14	2 to 3 years of maintenance and aftercare	16 776	1.00

Determine weighting factors

According to Tables B.7 and B.8

Weighting factor 1: Nature of terrain/accessibility	1.1 (Undulating)
Weighting factor 2: Proximity to urban area where goods and services are to be supplied	1.05

Calculation of closure costs

Table B.10 Template for Level 2: "Rules-based" assessment of the quantum for financial provision

Table 26: Calculation of closure cost

CALCULATION OF THE QUANTUM							
Mine:	Kenrau (Pty) Ltd			**Location:**	Bloemfontein		
Evaluators:	S Smit			**Date:**	18 September 2020		
No	**Description**	**Unit**	**A Quantity**	**B Master rate**	**C Multiplication factor**	**D Weighting factor 1**	**E=A *B*C*D Amount (Rand)**
			Step 4.5	**Step 4.3**	**Step 4.3**	**Step 4.4**	
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	m^2	0	16	1.00	1.1	R 0.00
2(A)	Demolition of steel buildings and structures	m^2	0	228	1.00	1.1	R 0.00
2(B)	Demolition of reinforced concrete buildings and structures	m^2	0	336	1.00	1.1	R 0.00
3	Rehabilitation of access roads	m^2	0	41	1.00	1.1	R 0.00
4(A)	Demolition and rehabilitation of electrified railway lines	m	0	395	1.00	1.1	R 0.00
4(B)	Demolition and rehabilitations of non-electrified railway lines	m	0	216	1.00	1.1	R 0.00
5	Demolition of housing and/or administration facilities	m^2	0	455	1.00	1.1	R 0.00
6	Opencast rehabilitation including final voids and ramps	ha	4	238 697	0.04	1.1	R 44531.34
7	Sealing of shaft, audits and inclines	m^3	0	122	1.00	1.1	R 0.00
8(A)	Rehabilitation of overburden and spoils	ha	0	159 131	1.00	1.1	R 0.00
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	ha	0	198 195	1.00	1.1	R 0.00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	ha	0	575 653	0.51	1.1	R 0.00
9	Rehabilitation of subsided areas	ha	0	133 249	1.00	1.1	R 0.00
10	General surface rehabilitation	ha	1	126 059	1.00	1.1	R 146 984.2
11	River diversions	ha	0	126 059	1.00	1.1	R 0.00

12	Fencing	m	0	144	1.00	1.1	R 0.00
13	Water Management	ha	0	50 807	0.17	1.1	R 0.00
14	2 to 3 years of maintenance and aftercare	ha	5	16 776	1.00	1.1	R 97801.00
15(A)	Specialists study	Sum	0				R 0.00
15(B)	Specialists study	Sum	0				R 0.00
Sum of items 1 to 15 above							R 288 9316.54
Multiply Sum of 1-15 by Weighting factor 2 (Step 4.4)		1.05		R 142 835.00		**Sub Total 1**	R 303 782.37

1	Preliminary and General	6% of Subtotal 1 if Subtotal 1 <R100 000 000.00	R 18 226.94
		12% of Subtotal 1 if Subtotal 1 >R100 000 000.00	-
2	Contingency	10.0% of Subtotal 1	R 30 378.24
		Sub Total 2 (Subtotal 1 plus management and contingency)	R 352 387.55
		Vat (15%)	R 52 858.13
		GRAND TOTAL (Subtotal 3 plus VAT)	**R 405 245.68**

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 405 245.68**.

(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

Table 27: Mechanisms for monitoring compliance with and performance assessment against the EMPR and reporting thereon.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
• Demarcation of site with visible beacons	Maintenance of beacons	• Visible beacons need to be placed at the corners of the mining area.	Role: • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: • Ensure beacons are in place throughout the life of the mine.	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.
• Site establishment	**Visual Characteristics:** • Visual intrusion as a result of site establishment.	• Minimize the visual impact of the activity on the surrounding environment through proper site management and implementing good housekeeping practices.	Role: • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit.	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			<u>Responsibility:</u> • Contain mining to the boundaries of the permitted area. • Ensure that the site have a neat appearance and is kept in good condition at all times. • Limit vegetation removal, and only strip topsoil immediately prior to the use of a specific area. • Rehabilitate and level the site upon closure to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.	
• Site establishment • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	**<u>Geology and Soil:</u>** • Loss of topsoil and fertility during mining and stockpiling • Loss of stockpiled material due to ineffective storm water control. • Erosion of returned topsoil after rehabilitation .	• Earthmoving equipment to reinstate mined-out areas. • Cover crop to be established on reinstated areas. • Erosion control infrastructure (if necessary)	<u>Role:</u> • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> • Strip and stockpile the upper 300 mm of the soil. • Carefully manage and conserve the topsoil throughout the stockpiling and rehabilitation process. • Ensure topsoil stripping, stockpiling and re-spreading is done in a systematic way. Plan mining in such a way that topsoil is stockpiled for the minimum possible time. • Place topsoil heaps on a levelled area within the mining footprint area. Do not stockpile topsoil in undisturbed areas. • Protect topsoil stockpiles against losses by water and wind erosion. Position stockpiles so as not to be vulnerable to erosion by wind and water. Establishment of plants on the stockpiles will help	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			prevent erosion. • Ensure that topsoil heaps do not exceed 1.5 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen. • Keep temporary stockpiles free of invasive plant species. • Divert storm- and runoff water around the mining area to prevent erosion. • Spread the topsoil evenly over the rehabilitated area, to a depth of 300 mm, upon closure of the site. • Strive to re-instate topsoil at a time of the year when vegetation cover can be established as quickly as possible afterwards, to that erosion of returned topsoil is minimized. The best time of year is at the end of the rainy season. • Plant and irrigate a cover crop immediately after spreading topsoil to stabilise the soil and protect it from erosion. Fertilise the cover crop for optimum biomass production. Rehabilitation extends until the first cover crop is well established. • Monitor the rehabilitated area for erosion, and appropriately stabilize if erosion do occur, for at least 12 months after reinstatement.	
• Site establishment • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining	**<u>Groundcover:</u>** • Infestation of the topsoil heaps and mining area with invader plant species. • Infestateion of	• Designated team to cut or pull out invasive plant species that germinated on site. • Herbicide application equipment.	<u>Role:</u> • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u>	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
area.	denuded areas with invader plant species. • Infestation of the reinstated area with invader plant species.		• Implement an invasive plant species management plan to control all invasive plant species on site in terms of NEM:BA, 2004 and CARA, 1983. • Keep all stockpiles (topsoil) free of invasive plant species. • Control declared invader or exotic species on the rehabilitated areas.	
• Site establishment. • Mining of gravel.	**Fauna:** • Potential impact on fauna within the footprint area. • Disturbance to fauna within the footprint area.	• Toolbox talks to educate employees how to handle fauna that enter the work areas.	Role: • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: • 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. •	Applicable throughout site establishment-, and operational phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.
• Site establishment • Screening, stockpile, and transporting material from site.	**Air Quality:** • Dust nuisance as a result of the mining activities.	• Dust suppression equipment such as a water car. • Signage that clearly reduce the speed on the access roads.	Role: • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: • Control the liberation of dust into the surrounding environment by the use of; inter alia, straw, water spraying and/or environmentally friendly dust-	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			allaying agents that contains no PCB's (e.g. DAS products). • Ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression. • Limit speed on the haul roads to 40 km/h to prevent the generation of excess dust. • Minimise areas devoid of vegetation. • Flatten and cover loads to prevent spillage and windblown dust during transportation. • Take weather conditions into consideration upon commencement of daily operations. Limit operations during very windy periods to reduce airborne dust and resulting impacts. • Ensure dust generating activities comply with the National Dust Control Regulations, GN No R827 promulgated in terms of NEM:AQA, 2004 and ASTM D1739 (SANS 1137:2012). • Implement best practice measures during the stripping of topsoil, loading, and transporting of material from site to minimize potential dust impacts.	
• Site establishment • Mining of gravel • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	**Noise Ambiance:** • Noise nuisance as a result of the mining activities. • Noise nuisance as a result of the decomissiononig activities.	• Silencers fitted to all project related vehicles, and the use of vehicles that are in road worthy condition in terms of the National Road Traffic Act, 1996.	Role: • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: • Ensure that employees and staff conduct themselves in an acceptable manner while on site. • No loud music may be permitted at the mining area.	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			• Ensure that all project related vehicles are equipped with silencers and maintained in a road worthy condition in terms of the National Road Traffic Act, 1996. • Implement best practice measures to minimise potential noise impacts. • Contract a qualified occupational hygienist to quarterly monitor and report on the personal noise exposure of the employees working at the mine. Monitoring must be in accordance with SANS 10083:2004 (Edition 5) sampling method as well as NEM:AQA 2004, SANS 10103:2008.	
• Mining of gravel. • Screening, stockpile, and transporting material from site. • Sloping and landscaping upon closure of the mining area.	**Waste Management:** • Soil contamination from hydrocarbon spills. • Potential impact assocaited with littering and hydrocarbon spills. • Potential impact associated with litter left at the mining area.	• Oil spill kit. • Sealed drip trays. • Formal waste disposal system with waste registers.	Role: • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. Responsibility: • Ensure regular vehicle maintenance, repairs and services take place in a demarcated service area of the permit holder. If emergency repairs are needed on equipment not able to move to the workshop / service area, 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 workshop in order to ensure proper disposal. • Provide ablution facilities in the form of a chemical toilet that is placed outside the 1:100 year floodline of any open water resource. Ensure the toilet is serviced at least once every two weeks for	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			the duration of the mining activities. • Ensure that the use of any temporary, chemical toilet facilities does not cause any pollution to water sources or pose a health hazard. In addition, ensure that no form of secondary pollution arise from the disposal of refuse or sewage from the temporary, chemical toilets. Address any pollution problems arising from the above immediately. • Equip the diesel bowser with a drip tray if used on site. The nozzle of the bowser must rest in a sleeve to prevent dripping after refuelling. • Clean drip trays after use. Do not use dirty drip trays. • Keep a spill kit 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 recognized facility. • Collect the contaminated soil from spillage that occurred, such as oil or diesel leaking from a burst pipe, within the first hour of occurrence, in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility. File proof. • Compile a waste management plan and implement it on site. The plan must focus on the waste hierarchy of the NEM:WA. • Contain general waste in marked, sealable, refuse bins placed at a designated area and remove waste from the mining area to a recognised general waste landfill site. • Prevent the burning or burying of waste on site. • Report any significant spillage of chemicals, fuels etc. during the lifespan of the mining activities to	

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			the Department of Water and Sanitation and other relevant authorities. • Park the machinery at the mining area with drip trays placed underneath stationary vehicles.	
• Mining of gravel.	• Potential impact on areas/infrastructure of heritage or cultural concern.	• Contact number of an archaeologist that can be contacted when a discovery is made on site.	<u>Role:</u> • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> • Confine all mining to the development footprint area. • Implement the following change find procedure when discoveries are made on site: ▪ If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. ▪ It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area. ▪ The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify SAHRA.	Applicable throughout site establishment-, operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
			▪ Work may only continue once the go-ahead was issued by SAHRA.	
▪ Crushing, screening, stockpiling and transporting material from site. ▪ Mining of gravel.	**<u>Hydrology:</u>** ▪ Storm water management	▪ Storm water management structures such as berms to direct storm- and runoff water around the stockpiled topsoil area (when needed).	<u>Role:</u> ▪ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ▪ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ▪ Divert storm water around the topsoil heaps to prevent erosion. ▪ Conduct activity in terms of the Best Practice Guidelines for small-scale mining as developed by DWS.	Applicable throughout site establishment-, operational-, and decommissioning phases. ▪ Daily compliance monitoring by site management. ▪ Annual compliance monitoring of site by an Environmental Control Officer.
▪ Screening, stockpile, and transporting material from site.	**<u>Existing Infrastructure:</u>** ▪ Deterioration of the access road to the mining area. ▪ Overloading of trucks having an impact on the public roads.	▪ Grader to restore the road surface when needed.	<u>Role:</u> ▪ Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. ▪ Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> ▪ Divert storm water around the access road to prevent erosion. ▪ Restrict vehicular movement to the existing access road to prevent crisscrossing of tracks through undisturbed areas. ▪ Repair rutting and erosion of the access road caused as a direct result of the mining activities. ▪ Prevent the overloading of the truck, and file proof of load weights for auditing purposes.	Applicable throughout operational phases. ▪ Daily compliance monitoring by site management. ▪ Annual compliance monitoring of site by an Environmental Control Officer.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY AND TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
• Site establishment. • Mining of gravel. • Crushing, screening, stockpiling and transporting material from site. • Sloping and landscaping upon closure of the mining area.	• Potential health and safety risks to employees.	• Stocked first aid box. • Level 1 certified first aider. • All appointments in terms of the Mine Health and Safety Act, 1996.	<u>Role:</u> • Site Manager to ensure day-to-day compliance with the guidelines as stipulated in the EMPR. • Compliance to be monitored by the independent Environmental Control Officer during the annual environmental audit. <u>Responsibility:</u> • Ensure adequate ablution facilities and water for human consumption is daily available on site. • Ensure that workers have access to the correct PPE as required by law. • Manage all operations in compliance with the Mine Health and Safety Act, 1996 (Act No 29 of 1996).	Applicable throughout operational-, and decommissioning phases. • Daily compliance monitoring by site management. • Annual compliance monitoring of site by an Environmental Control Officer.

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

The Environmental Audit Report in accordance with Appendix 7 as prescribed in Regulation 34 of the EIA Regulations, 2014 (as amended) will annually be submitted to DMRE for compliance monitoring purposes or in accordance with the time period stipulated by the Environmental Authorisation.

m) Environmental Awareness Plan

i) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

Once the Applicant received the mining permit and may commence with the proposed activity, a copy of the Environmental Management Programme will be handed to the site manager for his perusal. Issues such as the mining boundaries, fire principals and 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.

ii) 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.

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.
  - 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.

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

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

- **Discoveries:**
  - Stop work immediately.
  - Notify site manager/supervisor.
  - 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:
    - ✓ Water all roads and work areas.

- ✓ Minimize handling of material.
- ✓ 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.
  - Report or repair noisy vehicles.

- **Vegetation and Animal life:**

  - 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.
  - Do not set snares or raid nests for eggs or young.

- **Fire Management:**

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

n) Specific information required by the Competent Authority

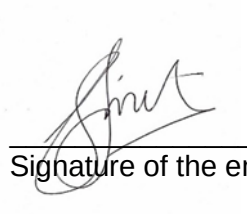
(Among others, confirm that the financial provision will be reviewed annually)

The Applicant undertakes to annually review and update the financial provision calculation, upon which it will be submitted to DMRE for review and approved as being sufficient to cover the environmental liability at the time and for closure of the mine at that time.

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 (Pty) Ltd

Name of Company:

30 September 2020

Date:

-END-

APPENDIX A

REGULATION 2(2) MINE MAP

APPENDIX B

LOCALITY MAP

APPENDIX C
SITE ACTIVITIES PLAN

APPENDIX D

LAND USE MAP

APPENDIX E
REHABILITATION MAP

APPENDIX F1 & F2

COMMENTS AND RESPONSE REPORT

&

PROOF OF PUBLIC PARTICIPATION

APPENDIX G

SUPPORTING IMPACT ASSESSMENT

ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, herewith please receive an environmental impact statement that summarises the impact that the proposed activity may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

ENVIRONMENTAL IMPACT STATEMENT			
SITE ALTERNATIVE 1			
TYPE OF IMPACT	**DURATION**	**LIKELIHOOD**	**SIGNIFICANCE**
Site Establishment: • Visual intrusion as a result of site establishment. • Loss of topsoil and fertility during mining and stockpiling • Infestation of the topsoil heaps and mining area with invader plant species. • Potential impact on fauna within the footprint area. • Dust nuisance as a result of the mining activities. • Noise nuisance as a result of the mining activities. • Work opportunities to 4 local residents **(Positive Impact)**	**Duration of site establishment phase (<1 month)**	**Possible** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Definite**	**Low-Medium Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium-High (+)**
Mining of gravel: • Soil contamination from hydrocarbon spills. • Disturbance to fauna within the footprint area. • Noise nuisance as a result of the mining activities. • Potential impact on areas/infrastructure of heritage or cultural concern.	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility**	**SIGNIFICANCE** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low Concern**
Crushing, screening, stockpiling and transporting material from site: • Loss of stockpiled material due to ineffective storm water control • Dust nuisance as a result of the mining	**Duration of operational phase (5 years maximum)**	**LIKELIHOOD** **Low Possibility** **Low Possibility**	**SIGNIFICANCE** **Low Concern** **Low Concern**

activities. • Noise nuisance as a result of the mining activities. • Potential impact associated with littering and hydrocarbon spills. • Infestation of denuded areas with invader plant species. • Deterioration of the access road to the mining area. • Overloading of trucks having an impact on the public roads.		**Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Possible**	**Low Concern** **Low Concern** **Low Concern** **Low Concern** **Low-Medium Concern**
<u>Sloping and landscaping upon closure of the mining area:</u> • Erosion of returned topsoil after rehabilitation. • Infestation of the reinstated area with invader plant species. • Noise nuisance as a result of the decommissioning activities • Potential impact associated with litter/hydrocarbon spills left at the mining area. • Return of the mining area to agricultural use by the landowner **(Positive Impact)**.	**Duration of decommissioning phase (±2 months)**	**<u>LIKELIHOOD</u>** **Low Possibility** **Low Possibility** **Low Possibility** **Low Possibility** **Definite**	**<u>SIGNIFICANCE</u>** **Low Concern** **Low Concern** **Low Concern** **Low Concern** **Medium-High (+)**

APPENDIX H
FINANCIAL AND TECHNICAL ABILITY

APPENDIX I

INVASIVE PLANT SPECIES MANAGEMENT PLAN

APPENDIX J

PHOTOGRAPHS OF THE PROPOSED SITE

APPENDIX K

CLOSURE / REHABILITATION PLAN

APPENDIX L
CV AND PROOF OF EXPERIENCE OF THE EAP