



**mineral resources**

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

## **BASIC ASSESSMENT REPORT**

**And**

## **ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

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

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**FILE REFERENCE NUMBER SAMRAD:** NC30/5/1/1/2/12383PR

## **1. IMPORTANT NOTICE**

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

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

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

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

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

## 2. Objective of the basic assessment process

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

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

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## PART A

# SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

### 3. Contact Person and correspondence address

#### a) Details of

##### (a) Details of the EAP

Name: TSHIFHIWA LAWRENCE MULOVEDZI

Cel. No.: 0782839291

Fax. No.: 0866967196

Email: tshifhiwalmu@gmail.com

#### i. Qualifications and Expertise of the EAP

Registered Professional Natural Scientist SACNASP 117182

Registered Independent Environmental Advisor IAIA: 5427

#### Experience

I have Environmental Consultant work experience which involved conducting Environmental Impacts Assessment process(EIA), Site Inspection, Site Visit, Monitoring, Public participation meetings, compile Environmental Management Plan, Safety File, Standards Environmental Specification, Protected trees protection, Streams protections, Pollution control, Biodiversity management, Rehabilitation management, Mining permits and rights Application, Water use license Application, Environmental authorization application, municipal wayleave applications, community liaison, and all of which have contributed to my personal development from the field of Portable Water Bulk Pipelines, Reservoirs, Water Pump Station, Sewage Pump Station and Sewage Main holes, Access Roads, Borrow Pits, Site Clearance, Batch Plats, Stream Crossings, Road Construction, Bridges , Liaison with Client, Engineers, Contractors, and communities.

**b) Location of the overall Activity.**

<b>Farm Name:</b>	OLYN FONTEIN 475
<b>Application area (Ha)</b>	103.0868ha
<b>Magisterial district:</b>	Postmasburg
<b>Distance and direction from nearest town</b>	Take R385 head east from Postmasburg for 7km, take the left exit and continue for 2km
<b>21 digit Surveyor General Code for each farm portion</b>	C03100000000047500006

**c) Location of the overall Activity.**

(show nearest town, scale not smaller than 1:25000)

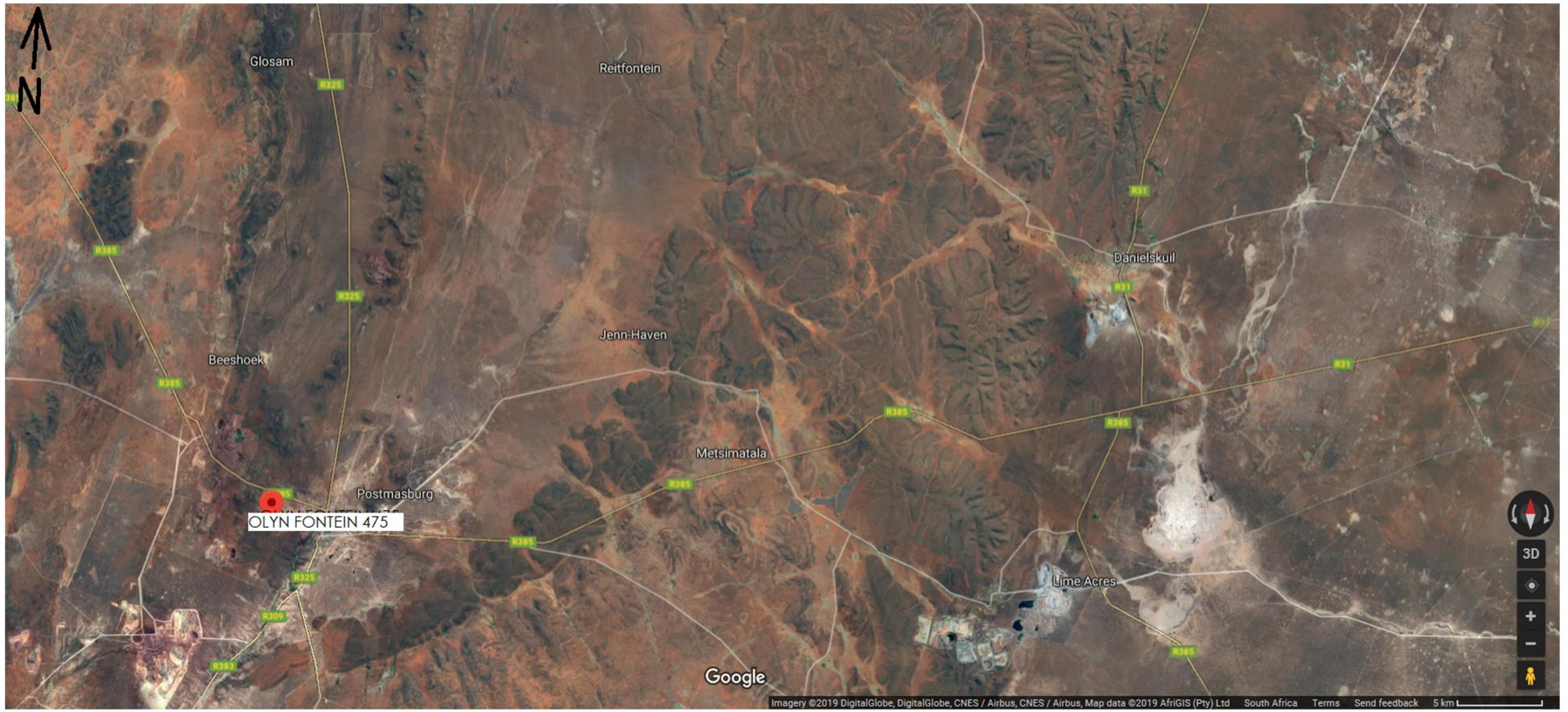
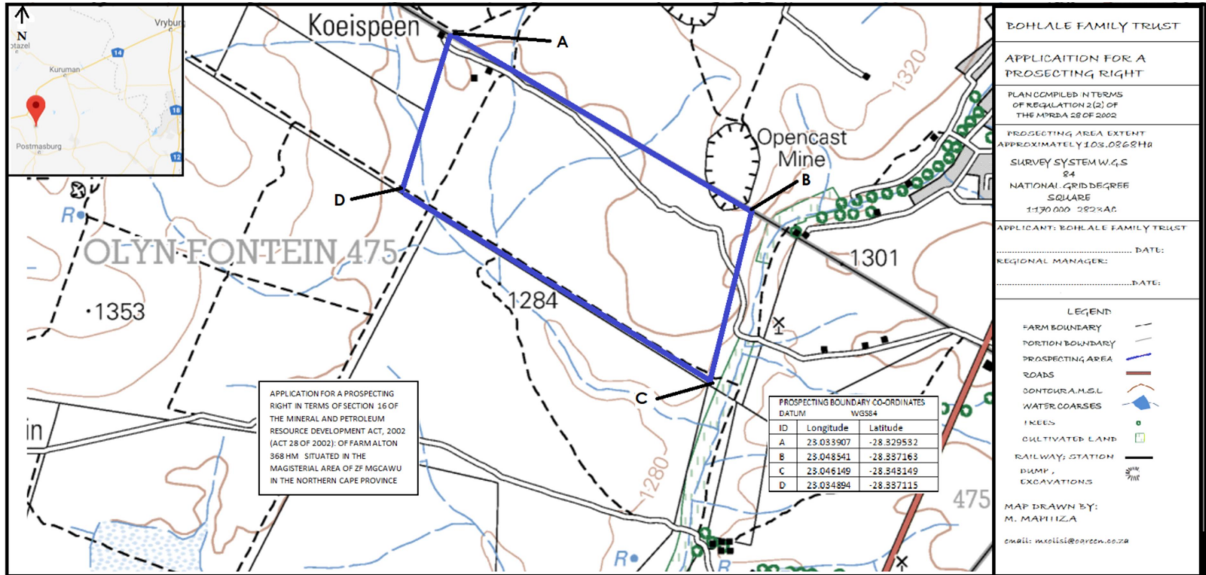


Figure 1: Locality Map

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

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



**Figure 2: Prospecting Area**

Please see Annexure C

**(i) Listed and specified activities**

<b>NAME OF ACTIVITY</b>  (E.g. For prospecting - drill site, site camp, ablution facility, 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.)	<b>Aerial extent of the Activity</b>  <b>Ha or m<sup>2</sup></b>	<b>LISTED ACTIVITY</b>  <b>Mark with an X where applicable or affected.</b>	<b>APPLICABLE LISTING NOTICE</b>  <b>(GNR 544, GNR 545 or GNR 546)</b>
Prospecting - Any activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).  5 diamond drill holes up to a maximum depth of 500 m are planned	103.0868 ha (Disturbed are 0,05 ha)	x	GNR 327 – Activity No. 20
Establishment of site camp	200m <sup>2</sup>	X	GNR 327 – Activity No. 27
Establishment of equipment storage area	100m <sup>2</sup>	X	GNR 327 – Activity No. 27
Ablution facilities (portable toilet)	10m <sup>2</sup>	X	GNR 327 – Activity No. 27
Drill sites 5 sites (boreholes including pads and sumps)	0.05ha (total)	X	GNR 327 – Activity No. 27
Rehabilitation of drill holes and disturbed areas	0.05 ha	X	GNR 327 – Activity No. 22
Clearance of vegetation for establishment of drill sites, site camp, ablution facilities and drill sites	1000m <sup>2</sup>	X	GNR 327 – Activity No. 27



## (ii) Description of the activities to be undertaken

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

Prospecting activities will be undertaken over a period of approximately 5 years. The application is for both non-invasive and invasive methods of prospecting.

### Planned Non-invasive Activities

(These activities do not disturb the land where prospecting will take place e.g. aerial photography, desktop studies, aeromagnetic surveys, etc) Drilling will be conducted using a diamond drill rig (refer **Figure 3**). The holes will be drilled to two different sizes [NQ -75.7 mm (outside) / 47.6 mm (core) and BQ - 60 mm (outside) / 36.5 mm (core)] determined by the formations. Experience in other sites have indicated that including the turning circle of vehicle, the area disturbed barely exceeds 147m<sup>2</sup> or 0.01 ha per hole. For the drilling of the envisaged 5 holes the areas to be affected will be approximately 0.05 ha. Fencing will be temporary

**Figure 3: Drill Rig**



## **PHASE 1**

**[Year 1: 6 months]**

### 1.1 Obtain all relevant historical data

Historical data detailing the position and economic potential of the target horizons will be identified for potential acquisition. The data obtained is anticipated to be in the form of historical borehole information, cadastral maps, geological maps, geophysical surveys (including existing published gravimetric, radiometric, magnetic, seismic and remote sensing data), as well as any information pertaining to previous exploration or mining will be consulted and integrated. The data will be scrutinised and verified (QA/QC procedure).

Data acquisition will begin with commercial negotiations to allow Western Allen Ridge to gain access to the boreholes for use in the desktop study, geological model and potential resource estimate.

### 1.2 Desktop study

**[Year 1: 6 months]**

A desktop study will be performed utilising all the historical reports obtained during Step 1.2.

## **PHASE 2**

**[Year 2: 3 months]**

### 2.1 Data synthesis and database creation

The above data will be compiled into a geological database, which will be utilised to present the relevant data in useable Geographic Information System (GIS) digital map format. The different data sets will be plotted on a base map of the project and surrounding areas in order to develop a geological model. This model will be used to further refine the exploration programme for the target area.

### 2.2 Definition of regional geological characteristics

**[Year 2: 3 months]**

With the improved geological and geophysical datasets it will be possible to increase the confidence in the basic sedimentological and structural geological models and identify areas where the initial geological model should be created.

### 2.3 Geophysical study

**[Year 2: 6 months]**

Magnetic, electromagnetic and electro resistivity survey will be conducted on the prospecting area to assess anomalies which will guide the drilling programme because of target areas that will be identified.



### **PHASE 3**

**[Year 3: 24 months]**

Drilling of 5 diamond drill holes to a depth of 100m each

Depending on the initial geological model established, a diamond drilling programme comprising of 10 boreholes will be undertaken, cores will be taken to the lab for analysis. Should the drilling programme prove to be successful, additional holes will be considered. This will be indicated in the form of a S102 application together with the proposed revised prospecting plan and EMP.

### **PHASE 4**

**[Year 5: 7 months]**

#### **4.1 Finalisation of 3D geological model**

Based on the re-logging and re-sampling of the historical core, the 3D geological model will be updated and finalised for use during resource estimation.

#### **4.2 Resource estimation**

**[Year 5: 5 months]**

Utilising the finalised geological model together with historical assay results and any results from re-sampling, a resource estimate will be performed.

Drilling will be conducted in a competent and environmentally responsible manner including rehabilitation of the drill sites to their original state. Plastic lining will be placed underneath the rig motors to prevent oil seepage. It is noted that no drilling fluids other than water for dust suppression, will be utilised in the case of diamond drilling. Environmental rehabilitation measures will be included in the contract with the drilling company and environmental rehabilitation costs will be included in the drilling costs

The drilling process will be managed in a competent manner and will involve the following actions:

- Call for drill tenders
- Review the registration, incorporation, employment equity and BEE of the drilling company
- Confirm the good financial standing of the drilling company
- Establishment of confidentiality agreements and management of conflicts of interest that the drilling company may have
- Review the drilling company's approach to Mines, Health and Safety issues
- Compile a preliminary analysis report
- Select drilling company
- Award of the drilling contract
- Obtain permission to access the property
- Submit information of planned drilling to Mines, Health and Safety at DMR

- Forward special instructions to the drilling company regarding power, water, environmental, safety and security
- Preliminary analysis report on notifications e.g. Eskom, Telkom, etc.
- Finalise the initial borehole positions
- Plan access roads, crew accommodation and site security
- Environmental assessment of drill sites
- Preparation of drilling sites
- Establish water source for drilling
- Plan health and safety issues and establish a safe working code specific to the area
- Perform the necessary risk assessments and Planned Task Observations (PTO)
- Monitor and control the drilling process
- Ensure secure core storage and sampling facilities
- Set QA/QC sampling procedures in place and insert proper reference material as samples
- Undertake site rehabilitation
- Take pictures before and after rehabilitation
- Compile preliminary analysis report on the start date of the drilling programme
- Plan additional infill borehole sites

A strict QA/QC programme will be conducted by the internal Qualified Person (QP)/Exploration Manager:

- Quality of drilling programme
- Survey of borehole collars utilising a GPS
- Sample management (weighing, splitting, transport)
- Logging and mineralisation/reef identification
- Sampling procedures
- Chain of custody of transport of samples to laboratory
- Laboratories utilised
- Quality control of standards, blanks and duplicates to ensure accurate assay methods and grades from laboratory
- Applicable assay method utilised for style of mineralisation
- QA/QC on lab results including check assaying at an umpire laboratory
- Database management
- External audits by Qualified Persons

**e) Policy and Legislative Context**

<p><b>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</b></p> <p>(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</p>	<p><b>HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.</b></p> <p>(E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)</p>
<p><b>Mineral and Petroleum Resources Development Act (No. 28 of 2002)</b></p> <p>The primary aim of the MPRDA is to recognise the sovereignty of the State over all the mineral and petroleum resources in South Africa and to promote equitable access to the Country’s resources. The MPRDA has a number of objectives, including to:</p> <ul style="list-style-type: none"> <li>• Promote equitable access to the nation’s mineral and petroleum resources to all the people of South Africa;</li> <li>• Substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, to enter the mineral and petroleum industries and to benefit from the exploitation of the nation’s mineral and petroleum resources;</li> <li>• Promote economic growth and mineral and petroleum resources development in the country;</li> <li>• Provide for security of tenure in respect of prospecting, exploration, mining and production operations;</li> <li>• Give effect to Section 24 of the Constitution of South Africa by ensuring that the nation’s mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and</li> <li>• Ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating.</li> </ul> <p>The MPRDA concerns equitable access to, and sustainable development of, South</p>	<p>In accordance with Section 16 of the MPRDA, Bohlale Family Trust is required to conduct a Basic Assessment and submit an EMP for approval to the Northern Cape DMR. A Prospecting Work Programme has been developed and submitted to the DMR. MNR Mining compiled the Basic Assessment Report in accordance with the MPRDA (and NEMA, where applicable</p>

<p>Africa's mineral and petroleum resources. The MPRDA makes provision for sustainable mining and requires:</p> <ul style="list-style-type: none"> <li>• That every person who has applied for a mining right must conduct an EIA, determine the environmental baseline, and submit an EMPR to the DMR;</li> <li>• That every holder of a mining reconnaissance permit, prospecting right, mining right, mining permit or retention permit must assess and communicate the impacts of the activity on the environment;</li> <li>• The need to rehabilitate the environment affected by prospecting or mining operations to its natural or predetermined state; and</li> <li>• That the directors of the mining company are liable for unacceptable impacts on the environment.</li> </ul>	
<p><b>National Environmental Management Act (No. 107 of 1998)</b></p> <p>The NEMA is South Africa's overarching environmental statute concerned with integrated environmental management (IEM) and the underlying principles by which environmental management must be undertaken. Its primary objective is to provide for co-operative governance, thus binding all organs of State by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance, and procedures for co-ordinating environmental functions exercised by organs of State and to provide for matters connected therewith (Government Gazette, 1998).</p> <p>The NEMA provides for the Constitutional right to an environment that is not harmful to the health and well-being of South African citizens, the equitable distribution of natural resources, sustainable development, environmental protection, and the formulation of environmental management frameworks (Government Gazette, 1998). Section 2 of NEMA sets out principles for sustainable integrated environmental governance; the principles are further detailed in subsequent sections of NEMA.</p> <p>Section 24(5), 24M and 44 of the NEMA enables the Minister to publish regulations pertaining to environmental impact assessments. The current Environmental Impact Assessment Regulations, GNR.326 (EIA Regulations), were published on 7 April 2017. Sections 24(2) and 24D of the NEMA make provision for the Minister to publish listed activities that would require environmental authorisation prior to commencement of that activity. The Minister published the following three Regulations in terms of Sections</p>	<p>In terms of Section 24(2) and 24(D) of the NEMA, authorisation is required for the following listed activities identified in terms of the following, which is detailed in Section 32(d)(i):</p> <ul style="list-style-type: none"> <li>• GNR 327 – Activity No. 20</li> <li>• GNR 327 – Activity No. 22</li> </ul> <p>This Basic Assessment Report will be submitted to the competent and commenting authority in support of the application for authorisation.</p>

<p>24(2) and 24D of the NEMA on 4 December 2014:</p> <ul style="list-style-type: none"> <li>• Regulation GNR.327 of 2017 which sets out a list of identified activities which may not commence without environmental authorisation from the competent authority and which must follow the Basic Assessment (BA) procedure as provided for in Chapter 4, Part 2 of the EIA Regulations;</li> <li>• Regulation GNR.325 of 2017 which sets out a list of identified activities which may not commence without environmental authorisation from the competent authority and which must follow the scoping and EIA procedure as provided for in Chapter 4, Part 3 of the EIA Regulations; and</li> <li>• Regulation GNR.324 of 2017, which sets out a list of identified activities per geographical area, which may not commence without environmental authorisation from the competent authority and which must follow the BA procedure as, provided for in Chapter 4, Part 2 of the EIA Regulations.</li> </ul>	
<p><b>National Water Act (No. 36 of 1998)</b></p> <p>The NWA provides for fundamental reformation of legislation relating to water resources and use. The preamble to the Act recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation’s water resources in the interests of all water users. The purpose of the Act is stated, in Section 2 as, inter alia:</p> <ul style="list-style-type: none"> <li>• Promoting the efficient, sustainable and beneficial use of water in the public interest;</li> <li>• Facilitating social and economic development;</li> <li>• Protecting aquatic and associated ecosystems and their biological diversity;</li> <li>• Reducing and preventing pollution and degradation of water resources; and</li> <li>• Meeting international obligations.</li> </ul> <p>The NWA presents strategies to facilitate sound management of water resources, provides for the protection of water resources, and regulates use of water by means of Catchment Management Agencies, Water User Associations, Advisory Committees and International Water Management.</p> <p>As this Act is founded on the principle that the government has overall responsibility for</p>	<p><b>No water uses, in terms of Section 40 and 39 of the NWA, are applicable to the Project.</b></p> <p>However, should the final drill hole positions require either a General Authorisation or Water Use Licence in terms of the NWA, the Applicant will consult with the Department of Water and Sanitation regarding authorisation of the water uses</p>

<p>and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, an industry (including mines) is only entitled to use water if the use is permissible under the NWA.</p> <p>Section 21 of the NWA provides a list of water uses which require a WULA prior to commencement, unless listed in Schedule 1 (of the NWA) as an existing lawful use. Applying for a WULA triggers NEMA listed activities as contemplated in terms of GNR.327 and GNR.325 of 2017.</p> <p>Water use includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. A water use must be licensed unless it is listed in Schedule 1 (of the NWA), is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a license.</p>	
<p><b>National Environmental Management: Biodiversity Act (Act No 10 of 2004)</b></p> <p>In terms of S57, the Minister of Environmental Affairs has published a list of critically endangered, endangered, vulnerable, and protected species in GNR 151 in Government Gazette 29657 of 23 February 2007 and the regulations associated therewith in GNR 152 in GG29657 of 23 February 2007, which came into effect on 1 June 2007.</p> <p>In terms of GNR 152 of 23 February 2007: Regulations relating to listed threatened and protected species, the relevant specialists must be employed during the EIA Phase of the project to incorporate the legal provisions as well as the regulations associated with listed threatened and protected species (GNR 152) into specialist reports in order to identify permitting requirements at an early stage of the EIA Phase.</p> <p>The Act provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (National Environmental Management: Biodiversity Act: National list of ecosystems that</p>	<p>As the applicant will not carry out any restricted activity, as is defined in S1 of the Act, no permit is required to be obtained in this regard.</p> <p>An ecological walkthrough of the location of the boreholes must be undertaken to ensure that no species listed as a protected species within the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004): Publication of Lists of Critically Endangered, Endangered, Vulnerable and Protected Species are identified within the development area. A permit will be required to be obtained should this species be impacted by the final borehole footprint.</p> <p>A permit would only be required to move species listed in the ToPS Regulations and PNCO. Unless a Red Data species is included in this legislation, a permit is not required</p>

<p>are threatened and in need of protection, (GG 34809, GN 1002), 9 December 2011).</p>	
<p><b>National Environmental Management Air Quality Act (No. 39 of 2004)</b>  The National Environmental Management Air Quality Act (No. 39 of 2004) (NEMAQA) allows for national, provincial and local air quality standards to be established as well as the declaration of priority areas. In addition, the NEMAQA requires that Air Quality Management Plans (AQMP) form part of the environmental implementation plan or environmental management plans to be prepared by national departments or the Province as required by Chapter 3 of the NEMA. Furthermore, the NEMAQA requires municipalities to include an AQMP into its integrated development plan (IDP). The NEMAQA requires the Minister of the DEA to publish a list of activities which results in atmospheric emissions which may have a detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions, ecological conditions or cultural heritage. The NEMAQA requires that an atmospheric emissions licence (AEL) be obtained for such listed activities. Such a list of activities was published in GNR.248 of 2010.</p>	<p><b>No activities requiring authorisation in terms of GNR.248 of 2010 of NEMAQA will be undertaken.</b></p>
<p><b>National Environmental Management Protected Areas Act (No. 57 of 2003)</b>  The National Environmental Management Protected Areas Act (No. 57 of 2003) (NEMPAA) concerns the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes, and includes inter alia:</p> <ul style="list-style-type: none"> <li>• The establishment of a national register of all national, provincial and local protected areas;</li> <li>• The management of those areas in accordance with national standards; and</li> <li>• Inter-governmental co-operation and public consultation in matters concerning protected areas.</li> </ul> <p>The NEMPAA defines various kinds of protected areas, namely: special nature reserves, national parks, nature reserves (including wilderness areas) and protected environments, world heritage sites, marine protected areas, specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the</p>	<p>Cognisance will be taken of existing and proposed protected environments</p>

<p>National Forests Act (No. 84 of 1998), and mountain catchment areas declared in terms of the Mountain Catchment</p>	
<p><b>Areas Act (No. 63 of 1970).</b></p> <p>Part 4 of Chapter 4 of the NEMPAA (Sections 48 to 53) lists restrictions of activities that may not be conducted in a protected area (as described above). Activities that are restricted include:</p> <p>Prospecting and mining activities;</p> <p>- Activities that are restricted by:</p> <ul style="list-style-type: none"> <li>• Regulations made by the Minister;</li> <li>• Regulations made by the MEC, in the case of provincial and local protected areas;</li> <li>• By-laws of the relevant municipality, in the case of local protected areas; and</li> </ul> <p>Internal rules made by the managing authority of the area;</p> <p>- Commercial and community activities where the survival of any species is negatively affected, or the integrity of an ecosystem is significantly disrupted; and</p> <p>- Any development or other activity that is inappropriate for the area given the purpose for which the area was declared.</p>	
<p><b>National Heritage Resources Act (No. 25 of 1999)</b></p> <p>The National Heritage Resources Act (No. 25 of 1999) (NHRA) established the South African Heritage Resources Agency (SAHRA) in 1999. SAHRA is tasked with protecting heritage resources of national significance. With regard to heritage sites, sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, dolomitic land and ridges, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure. A heritage site means a place declared to be a national heritage site by SAHRA or a place declared to be a provincial heritage site by a provincial heritage resources authority.</p> <p>Section 34 and 38 of the NHRA details specific activities that require a heritage impact assessment that will need to be approved by SAHRA. The following activities require a</p>	



<p>heritage impact assessment to be undertaken for the Proposed Project. The heritage specialist study has commenced, and the results will be provided in the EIA/ EMPR document.</p> <ul style="list-style-type: none"> <li>• Section 34(1): Structures older than 60 years may not be altered or demolished prior to permission from SAHRA;</li> <li>• Section 38(1a): The construction of a road, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;</li> <li>• Section 38(1c): Any development or other activity which will change the character of a site (i) exceeding 5,000 m<sup>2</sup> in extent, or (ii) involving three or more erven or subdivisions.</li> </ul> <p>Furthermore, section 48(2) requires a permit from a heritage resources authority to perform such actions at such time and subject to such terms, conditions and restrictions or directions as may be specified in the permit. This would include any development of the site where “development” means any physical intervention, excavation, or actions, other than those caused by natural forces, which results in a change to the nature, appearance or physical nature of a place, or influences its stability and future well-being, including:</p> <ul style="list-style-type: none"> <li>• Construction, alteration, demolition, removal or change of use of a place or a structure at a place;</li> <li>• Carrying out any works on or over or under a place;</li> <li>• Any change to the natural or existing condition or topography of land; and</li> <li>• Any removal or destruction of trees, or removal of vegetation or topsoil</li> </ul>	
<p><b>Hazardous Substances Act (No. 15 of 1979)</b>  The object of the Act is inter alia to ‘provide for the control of substances which may cause injury or ill health to, or death of, human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature or the generation of pressure thereby in certain circumstances; for the control of electronic products; for the division of such substances or products into groups in relation to the degree of danger; for the prohibition and control of such substances.’</p>	<p>Dangerous substances contained onsite during the construction, operation and closure phases of the Proposed Project will need to be management in accordance with the Act and safety data sheets (SDS) will need to accompany all dangerous goods (hydrocarbons, cleaning chemicals, paints, etc.).</p>

<p>In terms of the Act, substances are divided into schedules, based on their relative degree of toxicity, and the Act provides for the control of importation, manufacture, sale, use, operation, application, modification, disposal and dumping of substances in each schedule.</p>	
<p><b>Mine Health and Safety Act (No. 29 of 1996)</b>  The Mine Health and Safety Act (No. 29 of 1996) (MHSA) aims to protect and promote the health and safety of employees and persons that may be affected by the activities at a mine and outlines both the rights and responsibilities of an employer, as well as the obligations of employees working thereat.</p> <p>The MHSA was developed “to provide for protection of the health and safety of employees and other persons at mines”. That said the Act also provides and/ or promotes the following:</p> <ul style="list-style-type: none"> <li>• A culture of health and safety;</li> <li>• The enforcement of health and safety measures;</li> <li>• For appropriate systems of employee, employer and State participation in health and safety matters;</li> <li>• The establishment of representative tripartite institutions to review legislation, promote health and enhance properly targeted research;</li> <li>• For effective monitoring systems and inspections, investigations and inquiries to improve health and safety;</li> <li>• Promotion of training and human resources development;</li> <li>• Regulation of employers' and employees' duties to identify hazards and eliminate, control and minimise the risk to health and safety;</li> <li>• Entrenchment of the right to refuse to work in dangerous conditions;</li> <li>• To give effect to the public international law obligations of the Republic relating to mining health and safety; and</li> <li>• To provide for matters connected therewith.</li> </ul>	<p>The following principles are considered applicable to the Proposed Project and are detailed below:</p> <ul style="list-style-type: none"> <li>• The primary responsibility for ensuring a health and safe working environment in the mining site is placed on the mine owner. The Act sets out in detail the steps that employers must take to identify, assess records and control health and safety hazards in the mine;</li> <li>• The right of workers to participate in health and safety decisions, the right to receive health and safety information, the right to training and the right to withdraw from the workplace in face of danger;</li> <li>• The Act requires the establishment of institutions to promote a culture of health and safety and develop policy, legislation and regulations; and</li> <li>• The responsibility for enforcing MHSA lies with the Mine Health and Safety Inspectorate. The Inspectorate’s powers are recast and include the power to impose administrative fines upon employers who contravene the MHSA. The Act also contains innovative approaches to the investigation of accidents, diseases and other occurrences that threaten health and safety.</li> </ul> <p>Bohlale will be required to comply with all obligations contained in the MSHA.</p>
<p><b>Occupational Health and Safety Act (No. 85 of 1993)</b>  The Occupational Health and Safety Act (No. 85 of 1993) (OHSA) provides a legislative framework for the provision of reasonably healthy and safe conditions in the workplace. It also places extensive legal duties on employees and users of machinery and makes major</p>	<p>The OHSA is applicable and states that any person involved with construction, upgrades or developments for use at work or on any premises shall ensure as far as reasonably practicable that nothing about the manner in which it is installed, erected or constructed</p>

<p>inroads on employers' and employees' common law rights.</p> <p>OHSA contains provisions that impose general obligations with regard to health and safety. More detailed and specific obligations can be found in the regulations published in terms of OHSA. These include environmental, general safety, electrical machinery, driven machinery, electrical installation, construction, asbestos, hazardous chemicals substances and noise.</p> <p>The OHSA addresses, amongst others:</p> <ul style="list-style-type: none"><li>• Safety requirements for the operation of plant machinery;</li><li>• Protection of persons other than persons at work against hazards to health and safety, arising out of, or in connection with, the activities of persons at work;</li><li>• Establishment of an advisory council for occupational health and safety; and</li><li>• Provisions for matters connected herewith.</li></ul>	<p>makes it unsafe or creates a risk to health when properly used.</p>
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**f) Need and desirability of the proposed activities.**

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

For years, mining has been the driving force behind South Africa's economy and continues to make a valuable contribution to the country's economy. This economy is built on gold and diamond mining, with gold accounting for over a third of the country's exports. It is predicted that mining will still play an important role to the economy, most notably through foreign exchange earnings and employment provision. It is also one of the primary sectors that provide employment opportunities for unskilled and semi-skilled people.

The South African mining industry has its origin in small-scale mining activities, with these operations offering much needed employment opportunities and entrepreneurship, as well as contributing to the mineral sector and local economy. Small-scale mining impact on employment is especially observed in the rural areas where there are limited opportunities; providing significant livelihood for rural communities and a means of alleviating poverty.

Situated in the Northern Cape in South Africa, Postmasburg is completely surrounded by beautiful green foliage fed by a dam and several shimmering fountains.

Postmasburg was proclaimed a town in 1892 and named after Rev J Postma, a founding member of the Dutch Reformed Church. Postmasburg even had its own diamond rush. The first diamond was discovered in 1918 and as a result an open cast mine grew. The mine was permanently flooded in 1935 and as a result, just like Kimberley, Postmasburg could also boast its very own "Big Hole". This hole is over 45 m deep and filled with fish. It's a beautiful sight visited by many. Although diamonds are still mined here, the most important mineral is manganese.

The proposed project is for a small-scale mining operation is in Postmasburg, located in the Tsanstsabane Local Municipality.

Postmasburg also boasts spectacular architecture and many historical sites. An old blue dolomite stone Reformed Church built in 1908 can be visited. The Reverend Dirk Postma Statue is found nearby. There is also a rather impressive gun known as "Howitzer Gun" which stands at the civic centre. It honours the men of Postmasburg who died during World War II.

Given the nature of the proposed drilling, all impacts identified and discussed further below, will be limited to the footprint of the drill sites for boreholes. In this regard, boreholes should be planned away from homesteads/ villages so that people's health and wellbeing (in terms of noise, odours, visual character and sense of place) will not be impacted. Bohlale must adhere to mitigation measures proposed in the EMP to ensure that the impact of its proposed prospecting activities is avoided or minimised.

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

No project alternatives were considered for this assessment; this is because the proposed activity is to mine for mineral resources at the proposed farm.

The location of the mining site is determined by the location of the minerals. The activities and technology of the mining will ensure limited impact on the environment. The activities are limited to clearing of land for mining activities, drilling and blasting, loading, hauling, crushing and screening.

**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.

- (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.

Bohlale Family Trust proposes to undertake prospecting to determine whether or not the project area consist of the subject minerals if the proposed prospecting development delivers a positive outcome, the economic viability of the mineral (size, quantity, grade, etc.). The proposed activity will include the drilling of exploration boreholes. The associated activities/infrastructure will include: access to the drill sites and a campsite set up at each drill site only for the duration of drilling operations.

**Location Alternatives:** This property provides the ideal geological formation for the presence of manganese. The geological formation supports this assertion of a possibility of the minerals being present. Properties further west could have uneconomic low value commodities such as aggregates. These properties are not a reasonable alternative. This is not considered a reasonable location alternative. The proposed prospecting area is only for manganese.

**Access Route Alternatives:** No alternatives were considered for the access roads as the intention is to use existing roads. This will ultimately reduce the impact/ environmental footprint of the proposed project.

**Design/Layout Alternatives:** Since the drill sites are relatively small (12 m x 12 m) and the site infrastructure is very basic and standard for the type of operations, no design and layout alternatives for the proposed project were determined

**Technological Alternatives:** The initial option was to drill substantially more holes than that indicated here, however by using geophysics at an earlier stage of the project the number of holes can be moderated and reduced.

**Input Material Alternatives:** As mentioned above, water will be purchased from the local municipality and mobile generators will be used for the operation of the proposed project. In view of the above, no other input material alternatives were considered for this project. Note that no building facilities will be constructed at the project site since movable facilities in town will be used for the proposed project

**Operational Alternatives:** Exploration Drilling Methods is used to determine the depth, amount and thickness of the minerals at any point across a prospecting area. Drilling can either be done by non-core drilling or core drilling techniques:

o Non-Core Drilling Methods - Non-core drilling techniques mostly uses the rotary drilling methods. In this technique, a string of metal rods is rotated axially and a bit at the base of the string is forced downward, under controlled pressure, breaking up the ground and advancing the depth of the hole. Cuttings are swept away from the bit and lifted to the surface either by means of pumped circulating water or by jets of compressed air. Logging of the hole drilled by non-core drilling methods is mainly based on the cuttings obtained as the drill progresses. In view for the difficulty and error bound logging, this method of drilling was discarded and may be used only for infill drilling wherever necessary.

o Core-Drilling Methods - Core drilling techniques uses diamond drilling methods. In this technique, a hollow cylindrical drill bit impregnated with industrial diamonds is attached to a series of metal drill rods and rotated under controlled downward pressure. A circle of rock is ground away, the cutting removed by water flushing and a cylindrical core remains in the hollow centre of the drill string. Core drilling is the only satisfactory means of obtaining representative samples of seams at depth for quality determination. In view of the above, the preferred drilling method is the core drilling technique using the diamond drill.

**No-Go Option:** The 'no-go' alternative is the option of not undertaking prospecting activities on the project site. The no-go option assumes the site remains in its current state, which is largely agricultural in nature. The no-go alternative would result in no impacts on the social and biophysical environment. Bohlale intends on exploring the proposed area in order to determine availability of the subject minerals. Should the minerals be found at the prospecting area, Bohlale will achieve its long-term objective of owning and operating its own mine to benefit the local community where the operation takes place.

Accordingly, the consequences of not proceeding with the proposed project will have a detrimental impact on the potential positive impact this project may have on the future labour force. The no-go alternative is therefore not considered desirable at a local, regional and national scale, in terms of job creation and positive economic impacts.

## **i) 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.

### **Objectives of Public Participation**

The purpose of this Public Participation Process is:

- To provide Background Information to the proposed activity;
- To provide a locality map indicating the locality of the proposed activity;

- To notify potential Interested and Affected Parties of the Environmental Process to be followed in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002);
- To notify potential Interested and Affected Parties of the Environmental Process to be followed in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended; and
- To obtain issues and concerns from potential Interested and Affected Parties regarding the Environmental Process to be followed and the proposed activity, which will be addressed as part of the Public Participation Process.

## Background

The following steps have been undertaken as part of the public participation process in order to notify interested and affected parties:

- Potential I&APs were identified through the following process:

### The landowners

- Tsantsabane Local Municipality
- The I&APs were notified about the project by means of:
  - Media advertisements
  - Written notifications to the Local and District Municipalities.
- A newspaper advertisement was placed in the DFA (Diamond Field Advertiser)
- A Background Information Document (BID) was circulated to landowners, as well as all other identified I&APs via e-mail or registered mail. The BID highlighted the proposed project and invite participants to participate in the process. A reply sheet was attached to the BID on which I&APs can provide written comments on the proposed project.
- I&APs had the opportunity to review and comment on the Draft Basic Assessment Report.
- I&APs will be notified of the environmental authorisation, once received and the appeal process to be followed.

## **PROJECT MEETING**

A meeting will be held on at a future date, after the consultation report is requested by the DMR. Registered I&APs, stakeholders and landowners will be informed off this meeting by the contact information provided in their registration forms. The purpose of the meeting will be to visually present this project to the I &APs, take in their comments and to provide them with information on the project.

At the project meeting the I &APs will be also advised on how to access all the documents relating to the project.

#### Final BAR

The final BAR with all the comments incorporated from the I &APs will be made available to the I&APs in the same way that the draft BAR was.



- ii) **The Environmental attributes associated with the alternatives.**(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) **Baseline Environment**

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

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

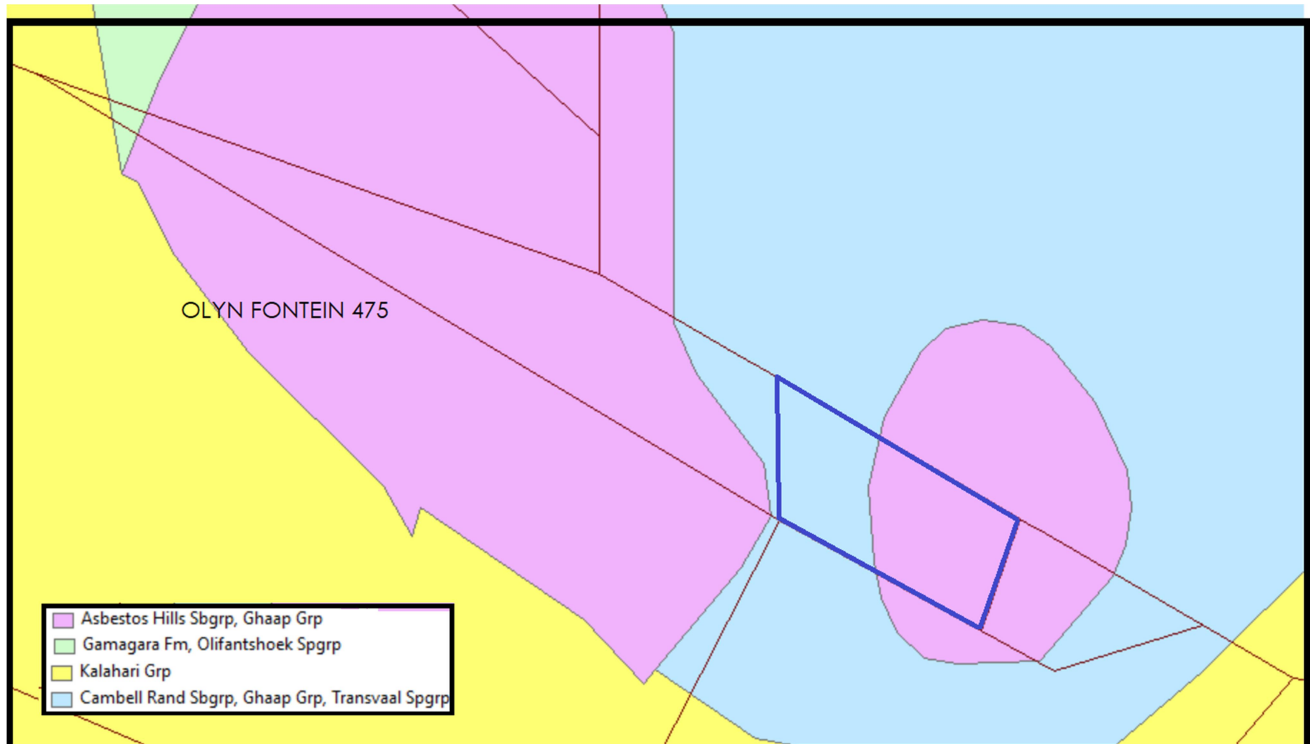
**GEOGRAPHICAL CHARACTER**

The regional geology of the area influences the geographical character of the area.

**GEOLOGY**

The specific area applied falls within the Transvaal Supergroup basin; and is characterised by iron formations of the Asbestos Hills Formation, and basaltic andesite and lavas of the Ongeluk Formation. Kalahari sands also occur in the area.

**FIGURE 4: Geology of project area**



**Topography**

The Northern Cape area is characterised by escarpments, hills and lowlands, with the series of koppies and ridges of the Ghaap Plateau. The general area is relatively flat, at an average elevation of between 1490m and 1530m, with a few koppies at 1590m above sea level (Refer to 1:50,000 topographic map sheets 2823AC).

## Climate

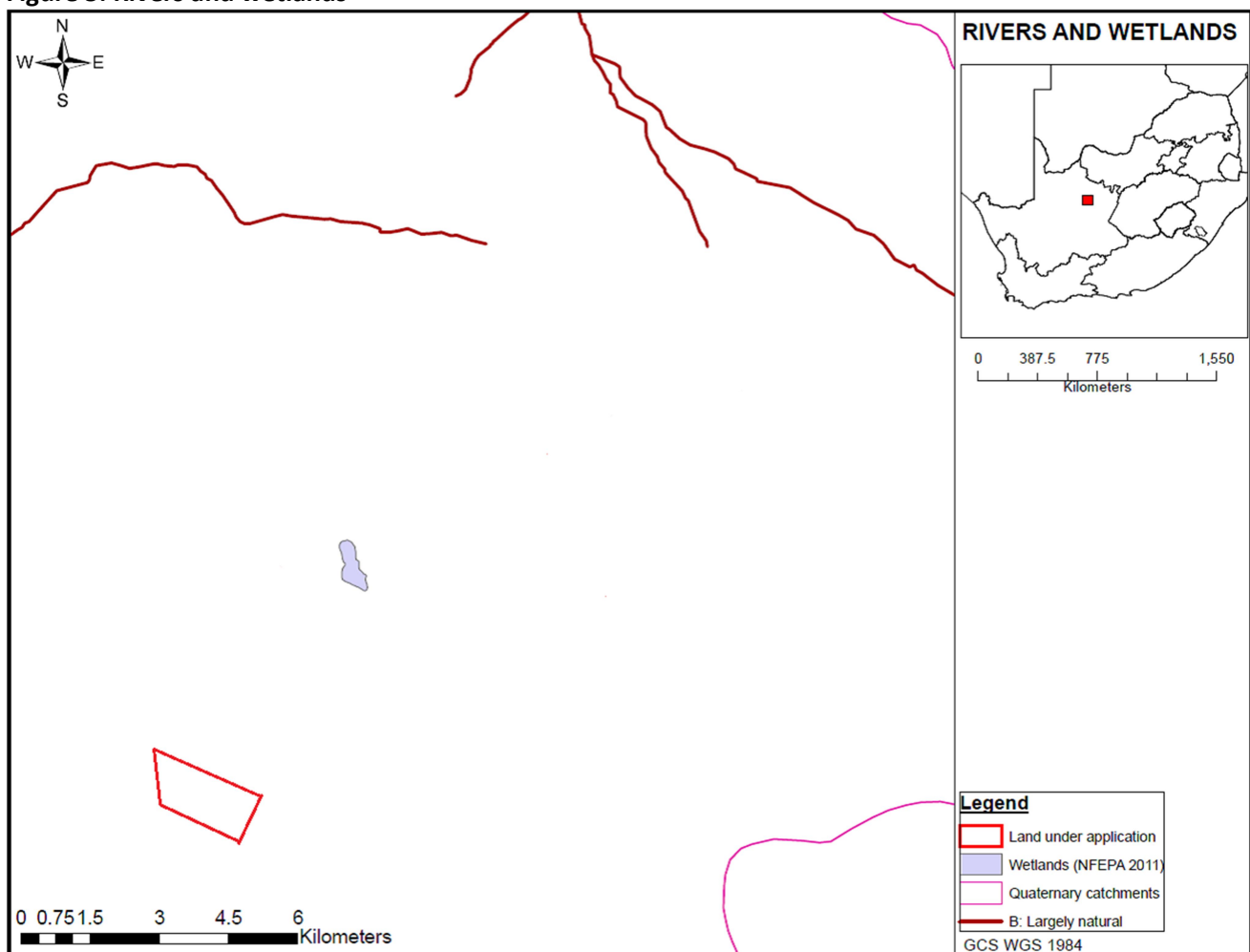
Climatic conditions in the study area comprised of summer rainfall with very dry winters can be described as being temperate, and semi-arid. Rainfall is strongly seasonal, with most rainfall occurring as thunderstorms during the summer period of October to April. Mean annual rainfall ranges from 500 to 700 mm. The mean annual temperature ranges between 16 and 32°C.

Maximum and minimum temperatures are experienced during January and July; respectively.

## Water Resources

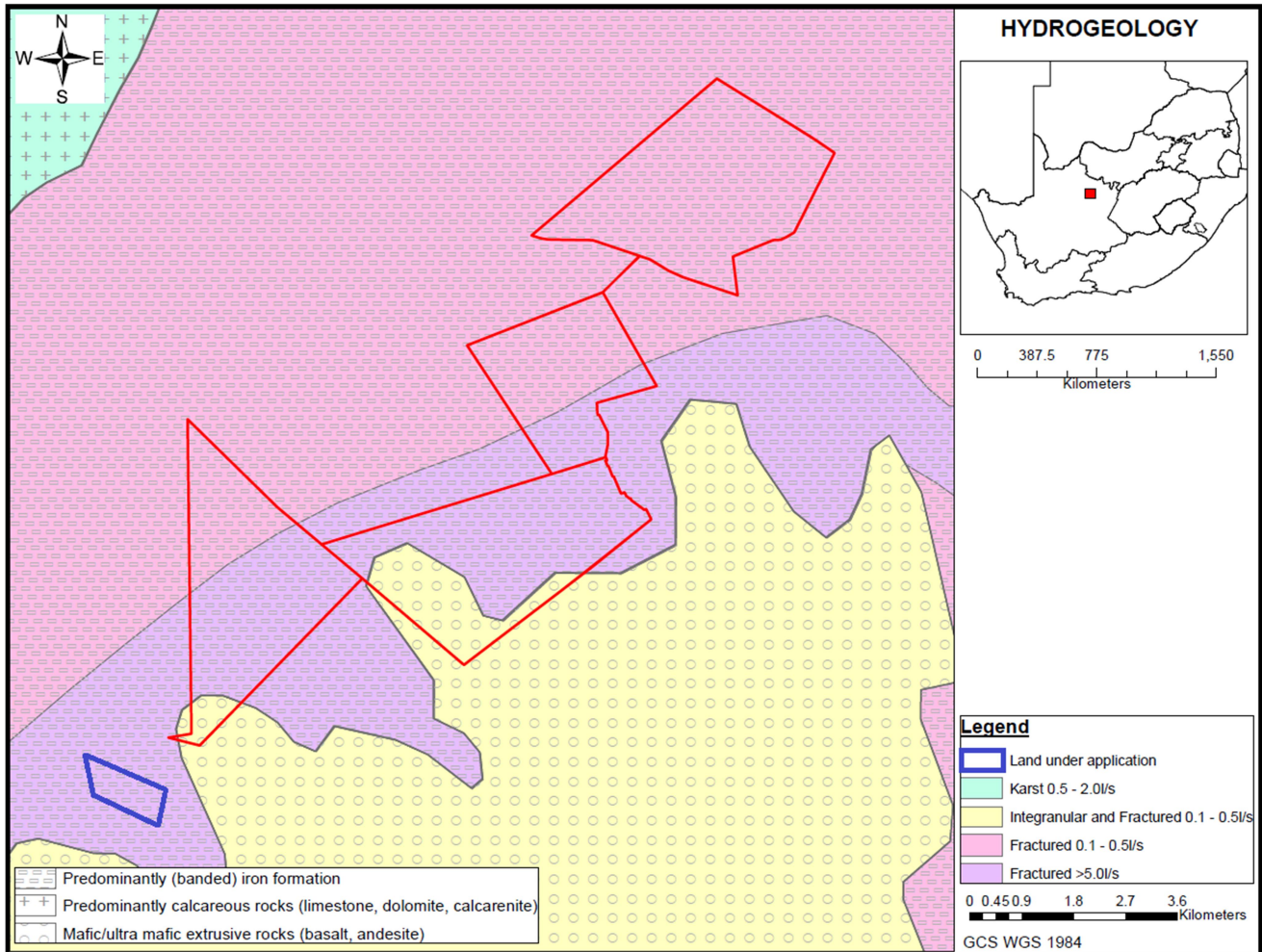
The proposed prospecting license areas are situated approximately 88.7Km north-west of the Vaal River and 99Km north of the Orange River, and falls within the Quaternary Catchment Area D73A. The tributaries of the Groenwaterspruit, which is classified as a B-largely natural river, is the main river flowing in close proximity to the area applied for, approximately 3Km. There are no notable dams in proximity to the area of interest, only a few small natural wetland areas.

**Figure 5: Rivers and wetlands**



The area under application is underlain by intergranular and fractured lithology, of mafic and ultramafic extensive rocks and fractured lithologies of predominantly banded iron formations. A small portion to the north-west of the interested area is underlain by karst-like structures of calcareous rocks, such as limestones and dolomites.

**Figure 6: Hydrogeology**



## ECOLOGY

The greater project area falls within the Savanna Biome, within the Eastern Kalahari Bushveld Bioregion and the Inland Saline Vegetation Bioregion. Only one vegetation type is associated with the project area, namely the Kathu Bushveld vegetation type, which is listed as Least Threatened in terms of Section 52 of NEMBA. The Ecosystem protection levels in Kathu Bushveld ecosystems are not protected as (less than 5% of the biodiversity target is met in formal protected areas).

The proposed prospecting area is located in the 8km from Kathu, town. It must be noted, however, that the ecosystem within the TIH PRA area has been completely transformed as a result of historic land-use practise (opencast mining).

CBA's are terrestrial and aquatic features in the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services. CBA's need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Ecological support areas (ESA's) are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. There are no CBA's or ESA's within the PRA area – the surrounding areas are classified as "Other Natural Areas" while the PRA area itself is bare / transformed by historic mining activities as per the Land Use and Land Cover images (discussed further in below).

According to the Mining and Biodiversity Guidelines (2013), there is no classification of biodiversity importance for the PRA site.

### Soil and land capability

The soil for the area which is applied for are comprised of two types of red-yellow Apedal freely drained soils, all of which have been contributed by amygdaloidal andestitic lava, interbedded tuff, cherts and red jasper of the Ongeluk Formation (Ae214, Ae215, Ae216, Ae219, Ag110 and Ag113). Two of the Apedal soils (Ae215 and Ag110) have also been contributed by surface limestone and wind-blown sands. There are also missilaneous soils in rocky areas (IB237) present in the area, which have been contributed by yellow-brown banded jaspilite, ironstones with amphibolite and ferruginized brecciated banded iron formations.

### Biodiversity

The proposed prospecting area falls within the Savanna Biome and mainly consists of Kuruman Mountain Bushveld (SVk10), Olifantshoek Plains Thornveld (SVk13) and Postmasburg Thornveld (SVk14, and the Southern Kalahari Salt pans (AZi4) of the Azonal Vegetation Biome. These vegetation types are rated as least threatened with a 16% (SVk10, SVk13 and SVk14), and a 24% (AZi4) conservation target. Approximately 8% of the Southern Kalahari Salt Pans are conserved in the Kgalagadi Transfrontier Park.

Although portions of each of the proposed prospecting areas may be transformed by cultivation, large areas remain untransformed and relatively undisturbed, comprising natural habitat that is important in maintaining local flora and fauna communities and ecosystem processes. The area under application is situated approximately 144Km south-west of the Mafikeng Bushveld ecosystem, which is considered a vulnerable ecosystem (Mucina and Rutherford's, 2006). Critical Biodiversity Areas and threatened ecosystems.

The Birds species that are known to naturally occur in the Northern Cape region as a whole are summarized in the table below. This however does not imply that all of these species will occur at any given place in the region as a whole (source: Duncan Butchart, 2001, Wildlife of the Lowveld, common animals and plants).

**Table 2: Bird species**

Species category	English name	Scientific name	Reporting rate (%)
Endangered	Saddlebilled Stork	Ephippiorhynchus senegalensis	2-18
	Damara Tern	Sterna balaenarum	2-23.9
Vulnerable	African Penguin	Spheniscus demersus	>11.4
	Pinkbacked Pelican	Pelecanus rufescens	<2
	Cape Gannet	Morus capensis	11.8-24.9
	Bank Cormorant	Phalacrocorax neglectus	8.4-30.1
	Cape Vulture	Gyps coprotheres	8-20
	African Whitebacked Vulture	Gyps africanus	2-18
	Lappetfaced Vulture	Torgos tracheliotos	2-28.5
	Whiteheaded Vulture	Trionoceph occipitalis	2-9.9
	Tawny Eagle	Aquila rapax	2-13
	Martial Eagle	Polemaetus bellicosus	7-17
	Bateleur	Terathopius ecaudatus	25-39.9
	African Marsh Harrier	Circus ranivorus	2-11
	Lesser Kestrel	Falco naumanni	> 17
	Blue Crane	Anthropoides paradiseus	> 22
	Corncrake	Crex crex	2.5-3.5
Kori Bustard	Ardeotis kori	>28.5	

	Ludwig's Bustard	Neotis ludwigii	>25
	Red Lark	Certhilauda burra	>24.9

### Socio-economic

The proposed prospecting area is located in the Tsantsabane Local Municipality area, which is one of six local municipalities within the Z.F. Mgcawu District Municipality (ZFM). The Z.F. Mgcawu District Municipality (ZFM) covers almost 30% of the Northern Cape Province and extends 102 524Km<sup>2</sup>, with 65 000Km<sup>2</sup> consisting of Kalahari Desert, Kgalagadi Transfrontier Park and former Bushman land. There are six local municipalities in the ZFM.

The population, according to the 2011 community census is 236 783, with an average density of 2.3 persons per Km<sup>2</sup>. This low distribution is due to the large dessert area in the Northern Cape Province. The racial make-up of the ZFM in 2011 is as follows; Black African at 29.4%, Coloured at 60.4%, Indian/Asian at 0.7% and White at 8.2% of the population. The table below shows the population distribution as per gender and age break down for the Tsantsabane Local Municipality.

**Table 3: Population distribution**

Tsantsabane Local Municipality						
Age Breakdown	Gender				Total	Percentage
	Male	%	Female	%		
0 to 4	1663	11	1599	10	3262	11
5 to 14	3383	23	3510	22	6893	22
15 to 34	5128	35	5656	35	10784	35
35 to 64	4007	27	4533	28	8540	28
Over 65	599	4	935	6	1534	5
<b>Total</b>	<b>14780</b>	<b>100</b>	<b>16233</b>	<b>100</b>	<b>31013</b>	<b>100</b>

There are more females than males for all of the age groups, except for the 0 to 4 age population. There is however a fair balance between the gender distribution within the age break downs. The population growth rate, according to the 2011 census was 2.59% in the Tsantsabane Local Municipality; this could mainly be contributed by the increase in mining activities in the area.

### Economic active population and economic sectors

The percentage of economically inactive persons and unemployment rate within the Z.F. Mgcawu District Municipality is 19.2%, with youth unemployment being 22.7% between the ages of 15 and 34 years. The youth unemployment rate for the same age group, in the Tsantsabane Local District is 32.3%. The main economic sectors in the ZFM are agriculture, mining and tourism.

In terms of income:

- For the Tsantsabane Local Municipality the affordability is low with as much as 55% of all households earning less than R19200 per annum.
- The individual income per month are as follows

**Table 4: Average Income**

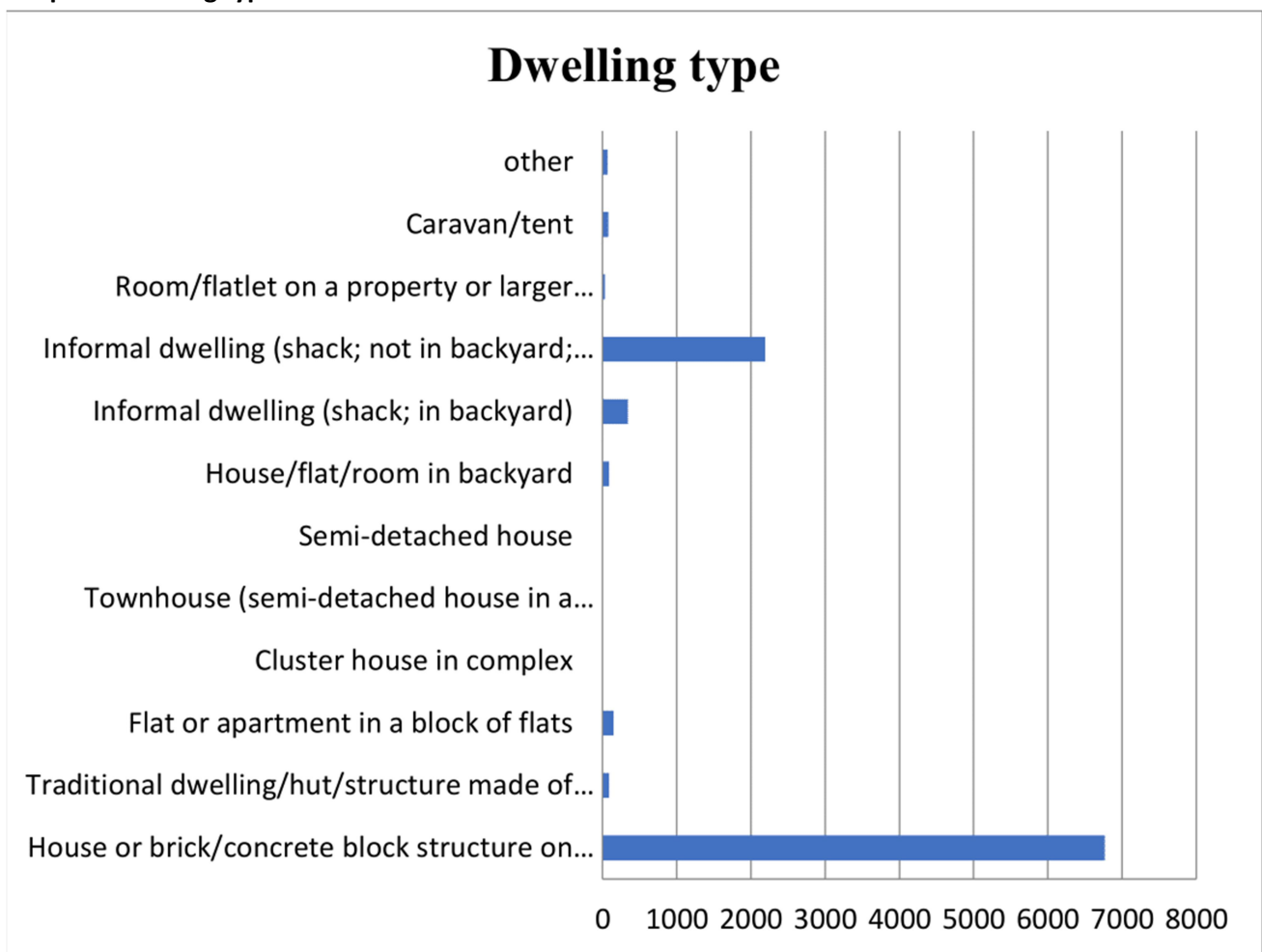
Average income	Population
None	21173
R1 – 400	1974
R401 – 800	3512
R801 – 1600	1287
R1601 - 3200	1462
R3201 - 6400	1016
R6401 – 12800	434

R12801 – 25600	101
R25601 – 51200	24
R51201 – 102400	19
R102401 – 204800	3
Over R204801	6

### Dwelling type

The majority of residents (6767 households) reside in house or brick/concrete block structure houses, followed by those who live (21952 households) in informal dwelling (shack; not in backyard; e.g. in an informal/squatter settlement or on a farm). It is clear that the municipality needs to look at innovative ways to respond to the plight of people living in informal dwelling, which could be by means of in situation upgrade if the conditions allows for upgrade

Graph 1: Dwelling type

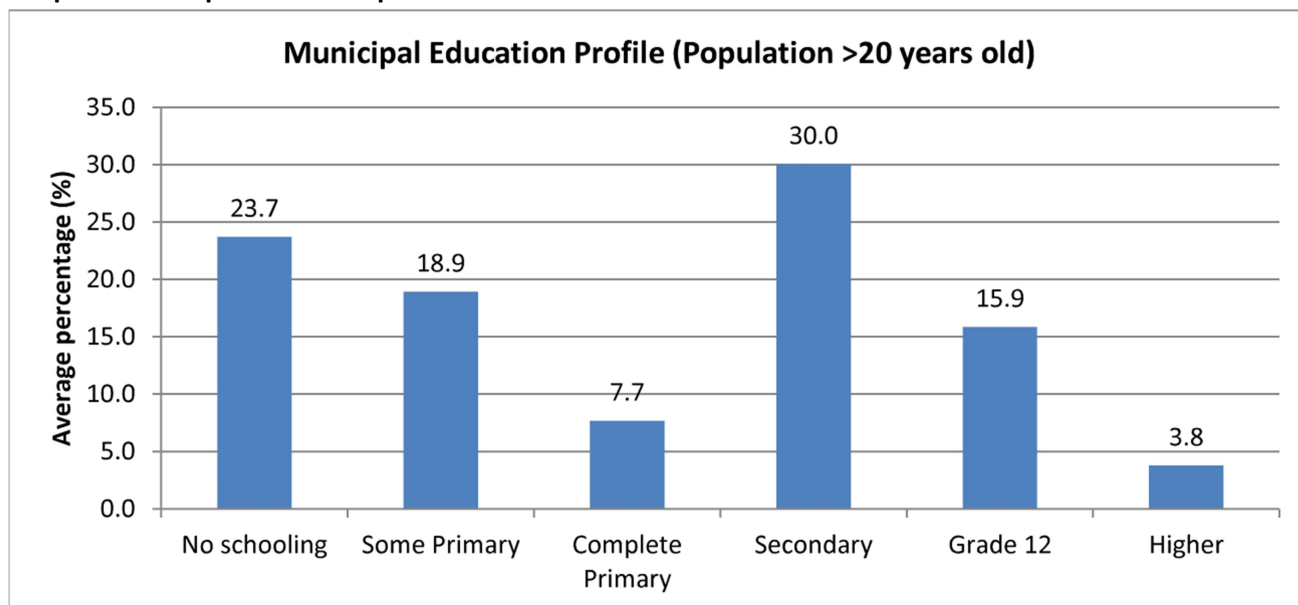


### Education and literacy levels

The literacy of the Tsantsabane Local Municipality is characterised by a large population, with their education ranging from some primary to secondary schooling to higher education level. A further 23.7% have no schooling



**Graph 2: Municipal education profile**



**Health**

The South African population is negatively affected by HIV/AIDS; and poses some serious problems to the economic development. The importance of knowing the prevalence cannot be over emphasised. Tuberculosis and HIV/AIDS are two of the priority infectious diseases in the ZFM. The greatest contributing factors for the increase in HIV/AIDS infections are illiteracy and poverty among the population.

**Cultural Heritage**

The sub-region is rich in heritage attributes relating back to the stone-age. Sites dating to the historic period can be related to early farming, infrastructure development, mining, industries and towns. These also include sites of conflict, e.g. dating to the Anglo-Boer War, cemeteries, etc.

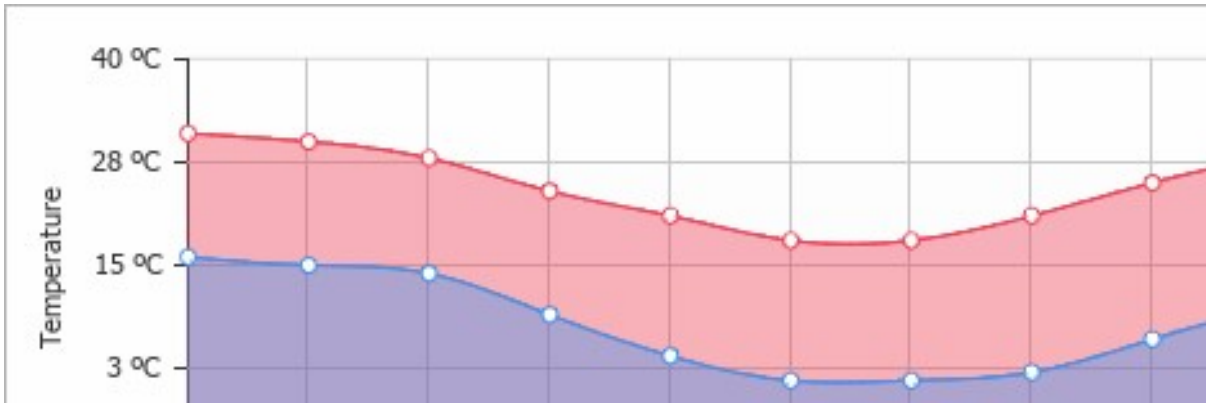
The importance of the above and other identified cultural heritage, archaeological site and artefacts cannot be over emphasised in order to ensure that they are preserved for current and future generations and for tourism.

No literature record could be found of fossils from the Kalahari Formation close to the prospecting area. Palaeontological evidence is restricted to a few pseudo-bone structures that are preserved in the limestone. No proof of any fossil material was collected from the rest of the Kalahari Formation. The project is therefore unlikely to pose a substantial threat to local fossil heritage. In Palaeontological terms the significance is rated as low to very low.

**CLIMATE**

Mostly arid to semiarid, few areas in the province receive more than 400 mm (16 in) of rainfall per annum and the average annual rainfall over the province is 202 mm (8.0 in).[11] Rainfall generally increases from west to east from a minimum average of 20 mm (0.79 in) to a maximum of 540 mm (21 in) per year. The west experiences most rainfall in winter, while the east receives most of its moisture from late summer thunderstorms. Many areas experience extreme heat, with the hottest temperatures in South Africa measured along the Namibian border. Summers maximums are generally 30 °C or higher, sometimes higher than 40 °C. Winters are usually frosty and clear, with southern areas sometimes becoming bitterly cold, such as Sutherland, which often receives snow and temperatures occasionally drop below the -10 °C mark

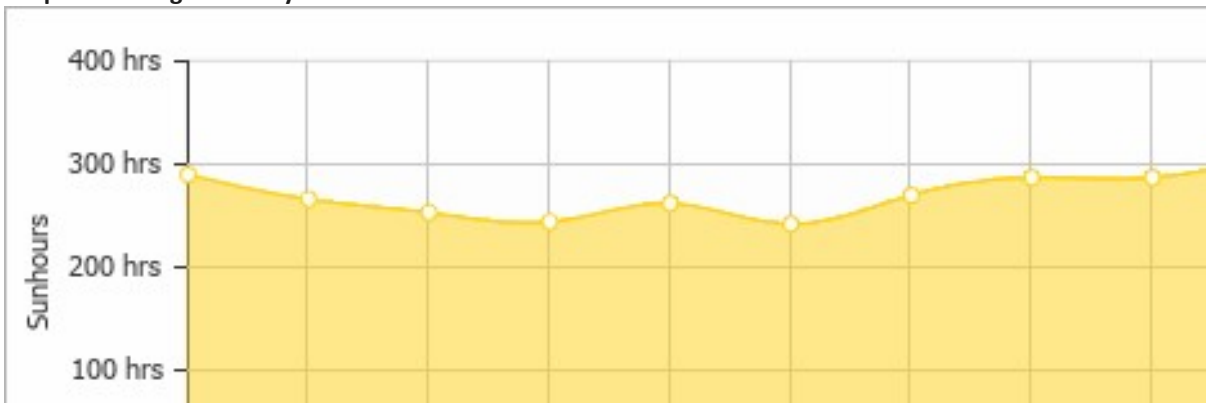
**Graph 3: The monthly mean minimum and maximum daily temperature**



**Average monthly hours of sunshine over the year**

This is the monthly total of sunhours

**Graph 4: Average monthly sunhours**



**Average percent of sunshine over the year**

This is the mean percent of sunhours during the day

**Graph 5: Average percentage of sunhours**



- On average, December is the most sunny.
- On average, June has the lowest amount of sunshine.



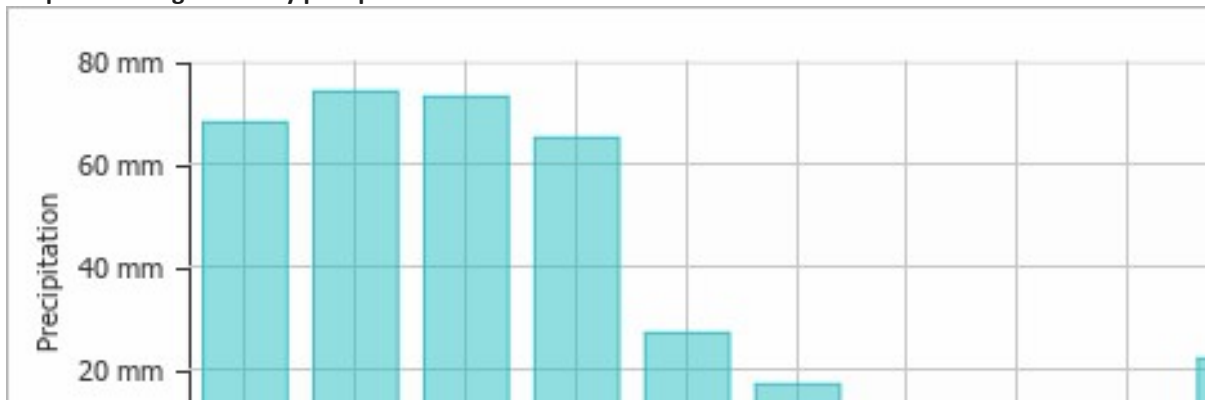
## PRECIPITATION

Kathu normally receives about 240mm of rain per year, with most rainfall occurring mainly during summer. The chart below shows the average rainfall values for Kathu per month. It receives the lowest rainfall (0mm) in June and the highest (55mm) in February. The monthly distribution of average daily maximum temperatures (centre chart below) shows that the average midday temperatures for Kathu range from 18°C in June to 33°C in January. The region is the coldest during July when the mercury drops to 0.2°C on average during the night. Consult the chart below (lower right) for an indication of the monthly variations of average minimum daily temperatures.

### Average monthly precipitation over the year (rainfall, snow)

This is the mean monthly precipitation, including rain, snow, hail etc

Graph 6: Average monthly precipitation



### Average monthly rainy days over the year

This is the number of days each month with rain, snow, hail etc

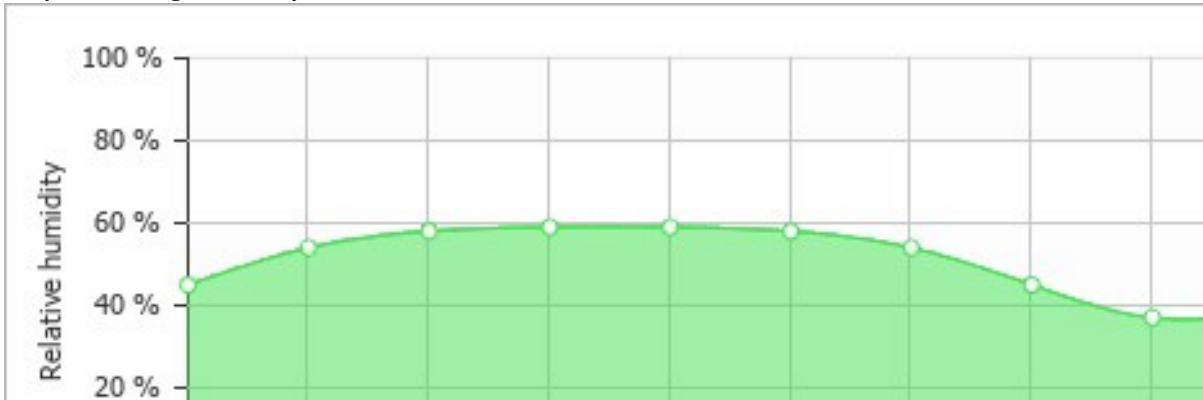
Graph 7: Average monthly rainy days over the year



### Average humidity over the year

This is the mean monthly relative humidity

Graph 8: Average humidity

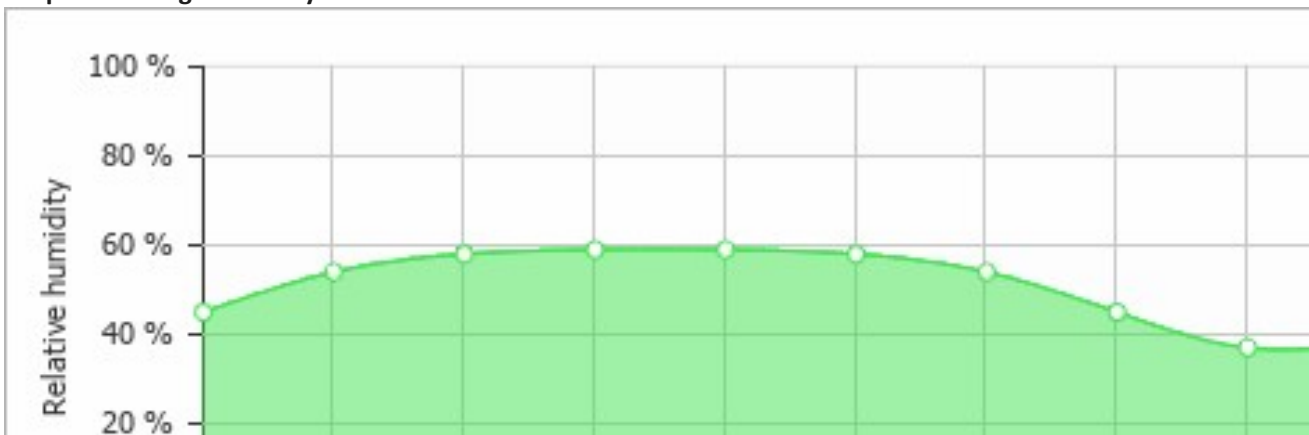


## HUMIDITY

### Average humidity in Kathu (Northern Cape)

The mean monthly relative humidity over the year in Kathu (Northern Cape), South Africa

Graph 9: Average humidity in Kathu



- On average, May is the most humid.
- On average, September is the least humid month.
- The average annual percentage of humidity is: 49.0%

## AIR QUALITY

The prospecting activities within the Prospecting Rights Area (PRA) will take place in the form of initial non-invasive prospecting activities, followed by invasive prospecting should the outcomes of the non-invasive activities warrant such. Should invasive measures be undertaken, activities will comprise exploratory drill hole areas, temporary driller's laydown and possibly access tracks. These areas will be demarcated and the vegetation in these areas cleared if necessary. Clearing activities may result in dust caused by the earthmoving activities as well as wind erosion across bare areas that are not stabilised by alternate means such as wet suppression. The creation of dust may thus result in temporary nuisance and aesthetic impacts (i.e. reduced visibility and soiling of materials) in the immediate vicinity of the activity, specifically during periods of increased activity or high wind speeds.

- Due to the historic land use and disturbed nature of the site it is unlikely that large quantities of vegetation will be removed
- The impact of dust will be short in duration and limited in extent. The potential impact will cease once prospecting activities have been completed and once the disturbed areas are successfully revegetated.

- The potential impact can be mitigated by limiting areas to be cleared to the smallest extent possible and by implementing dust suppression measures such as wetting where dust plumes are noted.
- Due to the limited extent of the areas to be cleared, and that dust generated is likely to fall below the threshold as per the NEMAQA National Dust Control Regulation Standards for residential areas significance of the impact is anticipated to be Low prior to- and after the implementation of the recommended mitigation measures.
- Fugitive dust: Occur as a result of vehicle entrainment of dust from local paved and unpaved roads, wind erosion from open areas and dust generated by agricultural activities. Given that the agriculture in the area is primarily restricted to livestock and game farming, agriculture is not anticipated to contribute significantly to ambient dust rates. Vehicle entrainment from the various unpaved farm and public roads is anticipated to be a significant but localised source of dust;
- Current mining operations in the area: Particulates represent the main pollutant of concern at mining operations, whether it is underground or opencast. The amount of dust emitted by these activities depends on the physical characteristics of the material, the way in which the material is handled and the weather conditions. Current mining operations in relatively close proximity to the mining area include Khumani Mine, Beeshoek Mine
- Biomass burning: biomass burning emissions include with carbon monoxide (CO), methane (CH<sub>4</sub>) and nitrogen dioxide (NO<sub>2</sub>) gases;
- Veld burning: represent significant sources of combustion-related emissions in many areas of the country;
- Rail related emissions: Emissions from diesel generated locomotives include particulates, nitrogen oxides (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), carbon monoxide (CO) and various volatile organic compounds including polycyclic aromatic hydrocarbons;
- Household fuel combustion: It is likely that households within the district municipality utilise coal or wood for cooking and space heating (during winter) purposes. Emissions from domestic burning include PM<sub>10</sub>, nitrogen dioxide (NO<sub>2</sub>), carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), polycyclic aromatic hydrocarbons, particulate benzo(a)pyrene and formaldehyde; and
- Vehicle tailpipe emissions: Significant primary pollutants include carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), hydrocarbons (HCs), sulphur dioxide (SO<sub>2</sub>), oxides of nitrogen (mainly NO<sub>x</sub>), particulates. Secondary pollutants include NO<sub>2</sub>, photochemical oxidants (ozone), sulphur acid, sulphates and nitric acid;

#### Emission sources associated with the Prospecting Area

The activities associated with the prospecting area that contribute to ambient air quality include:

- diesel generators;
- vehicle tail pipe emissions;
- vehicle activity on paved and unpaved roads;
- wind erosion from exposed working surfaces;
- removal of soil.

## SOILS

Soils are a significant component of most ecosystems. As an ecological driver, soil is the medium in which most vegetation grows and a range of vertebrates and invertebrates exist. In the context of mining operations, soil is even more significant if one considers that mining is a temporary land use where after rehabilitation (using soil) is the key to re-establishing post closure land capability that will support post closure land uses.

Mining projects have the potential to damage soil resources through physical loss of soil and/or the contamination of soils, thereby impacting on the soils' ability to sustain natural vegetation and altering land capability. Contamination of soils may in turn contribute to the contamination of surface and groundwater resources. Loss of the topsoil resource reduces chances of successful rehabilitation and restoration. To understand the basis of these potential impacts, a baseline situational analysis is described below.

### DATA SOURCES

Information in this section was sourced from the soil study undertaken by ARC (ARC, October 2008) as part of the approved EMPr (Metago, May 2009). As part of the project, the specialist confirmed that the results of the soil study undertaken in October 2008 are still relevant. The soil study undertaken as part of the approved EMPr (Metago, May 2009) and the specialist opinion (PGS, July 2017).

Soil information sourced through the review of available literature as well as studies undertaken near the farm (ARC, October 2008).

### RESULTS

#### Soil forms

The soil study (ARC, October 2008) undertaken for the approved EMPr (Metago, May 2009) indicated that the soil form associated with the farms is Hutton. The Hutton soil form comprises the following characteristics:

- a homogeneous texture, structure, and soil depth;
- a reddish brown apedal sandy topsoil on yellowish red apedal sandy subsoil;
- a low clay content; and
- it consists of deep (>1.5m) windblown sand and therefore drains rapidly.

### AGRICULTURAL POTENTIAL

The land capability classification is based on the soil properties and related potential to support various land use activities. Mining projects have the potential to significantly transform the land capability. To understand the basis of this potential impact, a baseline situational analysis is described below.

In the broadest sense, biodiversity provides value for ecosystem functionality, aesthetic, spiritual, cultural, and recreational reasons. The known value of biodiversity and ecosystems is:

- soil formation and fertility maintenance;
- primary production through photosynthesis, as the supportive foundation for all life;
- provision of food and fuel;
- provision of shelter and building materials;
- regulation of water flows and water quality;
- regulation and purification of atmospheric gases;
- moderation of climate and weather;
- control of pests and diseases; and

- maintenance of genetic resources.

The establishment of infrastructure as well as certain supportive activities have the potential to result in the loss of vegetation, habitat and related ecosystem functionality through physical disturbance and/or contamination of soil and/or water resources.

As a baseline, this section provides an outline of the type of vegetation occurring on site and the status of the vegetation, highlights the occurrence of sensitive ecological environments including sensitive/ endangered species (if present) that require protection and/or additional management actions should they be disturbed.

#### DATA SOURCE

Information in this section was sourced from the biodiversity study conducted by Ecological Management Services (EMS) (EMS, November 2008) as part of the approved EMP (Metago, May 2009). Information was also sourced from the updated biodiversity study undertaken for the project (EMS, February 2017)

### **(a) Description of specific environmental features and infrastructure on the site.**

Land use is defined as the operations that are occurring on land, as carried out by humans, with the intention to obtain products and/or benefits land through using resources. Land use therefore refers to the purpose the land serves, such as recreation, natural or agriculture. From Google Earth satellite imagery, ground-truthed during a site-visit undertaken on 28/11/2019.

Land cover is defined as the physical coverage on the earth's surface, such as the vegetation (natural or cultivated) or man-made constructions (buildings, etc.) which occur on the earth surface. Land cover data for the proposed project area was obtained from the SANBI GIS Land Cover Map 2015. There is no infrastructure on the farm only over grown vegetation.

**(b) Environmental and current land use map.**  
(Show all environmental, and current land use features)

**FIGURE 7: Land use overgrown vegetation**



**i) 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 impact section has been divided into 2 tables. Table 7 and 8 identifies and lists the various anticipated impacts, while Table 9 and 10 provides details on the rating of these impacts in terms the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be mitigated or reversed.

**Table 5: List of potential risks and mitigation measures**

Potential impacts	Mitigation measures
<b>Construction phase</b>	
<b>Fauna and Flora</b> – Clearance of vegetation for establishment of site camp	The drill/site camp will be placed in a disturbed area that will limit impacts on vegetation. <ul style="list-style-type: none"> <li>• No firewood harvesting will be allowed.</li> <li>• No fires will be made on site. Cooking will only be allowed on gas-stoves at designated areas.</li> <li>• No hunting will be allowed.</li> <li>• Should any protected tree or plant species be found on site, it will be avoided and a safe buffer (10-15 m) distance placed around it. If for any reason it cannot be avoided, the relevant permits will be applied for prior to removal</li> </ul>
<b>Air Quality</b> - dust creation due to clearance	Dust abatement by wetting down exposed areas at drill and/or camp site, where required.
<b>Environmental training</b>	All site personnel will have a basic level of environmental awareness training. <ul style="list-style-type: none"> <li>• Topics covered should include; • What is meant by “Environment”</li> <li>• Why the environment needs to be protected and conserved</li> <li>• How construction activities can impact on the environment</li> <li>• What can be done to mitigate against such impacts</li> <li>• Awareness of emergency and spills response provisions</li> <li>• Social responsibility during construction of the camp site e.g. being considerate to local residents</li> </ul> <ul style="list-style-type: none"> <li>• The need for a “clean site” policy also needs to be explained to the workers</li> </ul>
<b>Prospecting (operational) phase</b>	
<b>Environmental training</b>	<b>All site personnel will have a basic level of environmental awareness training.</b> <ul style="list-style-type: none"> <li>• Topics covered should include; • What is meant by “Environment”</li> <li>• Why the environment needs to be protected and conserved</li> <li>• How construction activities can impact on the environment</li> <li>• What can be done to mitigate against such impacts</li> <li>• Awareness of emergency and spills response provisions</li> <li>• Social responsibility during construction of the camp site e.g. being considerate to local residents</li> </ul> <ul style="list-style-type: none"> <li>• The need for a “clean site” policy also needs to be explained to the workers.</li> </ul>
<b>Air quality</b> – dust creation due to vehicle movement and drilling	Dust abatement by wetting down exposed areas at drill and/or camp sites will be required. <ul style="list-style-type: none"> <li>• Vehicles will stay on the approved or available tracks as far as practically possible.</li> </ul>

	<ul style="list-style-type: none"> <li>• Low speed limits will be set to avoid the creation of dust (40 km/hr).</li> <li>• All the equipment and vehicles will be equipped with the manufactures stock standard exhaust systems which will minimise the amount of emissions from their engines.</li> <li>• No burning of waste will be allowed on site.</li> <li>• Fire extinguishers and other fire safety equipment will be available on site.</li> <li>• Drilling locations as set out by the final layout plan and as discussed with the relevant landowners will be adhered to.</li> <li>• Excavations and other clearing activities will only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.</li> <li>• Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Project Geologist and Drilling Contractor.</li> <li>• All areas will be rehabilitated immediately upon conclusion of work conducted</li> </ul>
<b>Noise pollution</b> – vehicle movement, use of drill rigs and excavation machinery	<ul style="list-style-type: none"> <li>• The activities will comply with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996) and its regulations as well as other applicable legislations regarding noise control.</li> <li>• Employees will be supplied with ear plugs. All prospecting vehicles will be maintained in a road worthy condition.</li> <li>• All work will be limited to daylight hours, i.e. between 6am and 6pm</li> </ul>
<b>Waste pollution</b> – domestic waste produced by workers	<ul style="list-style-type: none"> <li>• Bins will be emptied on a regular basis.</li> <li>• Domestic waste to be removed from site - no burying or burning of domestic waste will be allowed.</li> <li>• Ablution facilities will be regularly serviced.</li> </ul>
<b>Water pollution</b> (Surface and groundwater, wetlands and water bodies) – due to possible spillages, leaks from vehicles or ablution facilities	<ul style="list-style-type: none"> <li>• Limited amounts of water (approximately 2000 litres / day) will be used during drilling. Water will be trucked to site.</li> <li>• Ablution facilities will not be placed within 100 m of any water body.</li> <li>• No construction footprint will take place inside or within 100 meters of any water body or wetland.</li> </ul> <p><b>Hazardous materials</b></p> <ul style="list-style-type: none"> <li>• All storage tanks containing hazardous materials will be placed in bunded containment areas with sealed surfaces.</li> <li>• The bund wall must be high enough to contain 110% of the total volume of the stored hazardous material with an additional allocation for potential high runoff storm water events.</li> <li>• Any hazardous substances will be stored at least 100 m from any of the water bodies on site.</li> <li>• Contaminated wastewater will be managed by the Contractor to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp will be collected and removed from the site for appropriate disposal at a licensed commercial facility.</li> </ul>
<b>Soils</b> – soil erosion and pollution due to exposed areas not being managed, leaks or spillages from ablution facilities	<p>Dust abatement by wetting down exposed drill site and camp areas will be required.</p> <ul style="list-style-type: none"> <li>• Stockpiles will be below the 1.5 m height restriction.</li> <li>• The use of oil drip trays under drilling equipment to ensure no spillage of oils and fuels onto the ground.</li> <li>• Where possible, no major vehicle repairs will be done on site.</li> <li>• Oils and fuel will be stored on bounded areas to avoid spillages.</li> </ul> <p>• Any spillages which may occur will be investigated and immediate action will be taken. In the event of significant spills (in excess of 35 litres) of any hazardous</p>



	<p>substance, this will be recorded and reported to the environmental personnel, Department of Water and Sanitation, DMR and any other relevant authorities. In such cases the contaminated soil will be excavated and disposed at a suitably licensed and registered landfill.</p> <ul style="list-style-type: none"> <li>• An emergency plan for spillages will be available on site.</li> <li>• Storm water runoff in and around drill holes will be controlled.</li> <li>• Keep equipment and vehicles within the limits of the initially disturbed areas.</li> <li>• Apply erosion control measures (i.e. silt fences) in areas that have high risk for erosion.</li> </ul>
<b>Fauna and Flora</b> – due to uncontrolled vehicle movement or improper rehabilitation	<ul style="list-style-type: none"> <li>• Only demarcated areas for drilling will be cleared to the minimum required for access and adjacent and/or other areas will not be disturbed.</li> <li>• No firewood harvesting will be allowed.</li> <li>• No fires will be made on site. Cooking will only be allowed on gas-stoves at designated areas.</li> <li>• No hunting will be allowed.</li> <li>• No cigarette butts will be disposed of on the relevant properties.</li> <li>• Should any protected tree or plant species be found on site, it will be avoided and a safe buffer (10-15m) distance placed around it. If for any reason it cannot be avoided, the relevant permits will be applied for prior to removal.</li> <li>• Vehicles will remain on approved tracks.</li> <li>• See rehabilitation mitigation measures</li> </ul>
<b>Fire Prevention</b>	<ul style="list-style-type: none"> <li>• The Drilling Contractor will have operational fire- fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.</li> <li>• See mitigation measures for Fauna and Flora above</li> </ul>
<b>Erosion</b>	<ul style="list-style-type: none"> <li>• Wind screening and storm water control will be undertaken to prevent soil loss from the site.</li> <li>• All erosion control mechanisms will be regularly maintained.</li> <li>• Re-vegetation of disturbed surfaces will occur immediately after the construction and prospecting activities are completed.</li> <li>• Rehabilitation will be undertaken progressively</li> </ul>
<b>Visual impact</b> – may impact on surrounding land uses where visitors value the undisturbed / untransformed characteristics of the general region and due to the visibility of vehicles	<ul style="list-style-type: none"> <li>• Visual impacts will be of a temporary nature and unfortunately cannot be mitigated.</li> </ul>
<b>Cultural and Heritage Artifacts</b>	<ul style="list-style-type: none"> <li>• Local museums as well as the South African Heritage Resource Agency (SAHRA) will be informed if any artifacts are uncovered in the affected area and mitigation measures recommended by SAHRA will be followed.</li> <li>• The contractor will ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological finds to the ECO so that appropriate action can be taken</li> <li>• Any discovered artifacts will not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted.</li> <li>• Drill sites are to be positioned to not impact on any identified sites heritage significance</li> </ul>
<b>Fauna and Flora</b> – due to uncontrolled vehicle movement or improper	<ul style="list-style-type: none"> <li>• Mitigation measures as per Part B (EMPr) of this report will be adhered to.</li> <li>• Site activities will be restricted to daylight hours between 6am and 6pm and as per the agreement with the landowner/s.</li> </ul>

rehabilitation	<ul style="list-style-type: none"> <li>• Vehicles will remain on the existing tracks.</li> <li>• Prospecting activities will not be conducted within 100 m of pens and stalls.</li> <li>• All equipment will be removed from site.</li> <li>• Rehabilitation will be done in such a manner that the site is in the state prior to prospecting.</li> <li>• All structures comprising the drilling camp will be removed from site.</li> <li>• The area that housed the drilling camp will be checked for spills of substances such as oil, paint, etc., and these will be cleaned up and contaminants disposed of appropriately</li> </ul>
<b>Land degradation</b> – due to improper site clean-up	<ul style="list-style-type: none"> <li>• All waste bins and domestic waste will be removed from site once the activity is complete.</li> <li>• Excess topsoil not used in rehabilitation will be levelled.</li> <li>• All equipment will be removed from site on completion of the activity.</li> <li>• All areas where temporary services were installed will be rehabilitated to the satisfaction of the ECO.</li> <li>• The site will be cleared of all litter.</li> <li>• Final inspection in order to ensure adherence to EMPr guidelines, completion of localised/ remaining areas of impact, monitoring of rehabilitation success, etc.</li> </ul>
<b>Socio-environmental</b>	
<b>Increase Traffic</b> - During prospecting 4x4 vehicles will be utilising the existing road network. This may result in the impeding of traffic flow and damage to the existing roads such as the main access roads to the proposed development site.	<ul style="list-style-type: none"> <li>• <b>Warning signage will be erected at all intersections, including at the intersections with farm access roads.</b></li> <li>• Heavy vehicles will not travel the road between 10pm and 6am unless it is absolutely unavoidable and has been discussed with the relevant landowner.</li> <li>• Sufficient distance will be maintained between heavy vehicles to allow light vehicles to overtake safely.</li> <li>• All drivers will be made aware of the procedures to be followed if an accident occurs.</li> <li>• If any damage to gravel roads occur as result of drilling, the damage will either be compensated for or repaired.</li> <li>• See mitigation measures as outlined in Table 1 above relating to dust and traffic speed.</li> </ul>
<b>Nuisance (Air and Noise)</b> - Impacts on air quality will primarily result from increased dust levels associated with the required drilling. It is anticipated that there will be an increase in noise levels during prospecting which will be associated with the operation of vehicles, drilling and sampling equipment.	<ul style="list-style-type: none"> <li>• See mitigation measures as outlined in Table 7 above.</li> </ul>
<b>Water pollution (ground and surface water)</b> - Various substances may result in the pollution of surface and groundwater sources. Pollution from litter and general wastes may occur due to improper site management. Washing down of vehicles and equipment may result in the pollution of groundwater, and pollution may occur from poor vehicle maintenance and improper	<ul style="list-style-type: none"> <li>• See mitigation measures as outlined in Table 7 above.</li> </ul>

storage of hazardous materials such as fuel, etc.	
<b>Socio economic</b>	
<b>Cultural environment</b> - The project could possibly have an impact on farm owners' sense of place as the project will alter the landscape (short-term); The project could have an impact on cultural heritage values, as well as heritage artefacts if these are found within the area	<ul style="list-style-type: none"> <li>• The applicant will, before commencing any prospecting activity, ascertain whether the designated site does not include a heritage site.</li> <li>• Any heritage sites/artefacts found will be reported to SAHRA.</li> <li>• National heritage sites will not be destroyed, damaged, excavated, altered, or defaced without a permit.</li> <li>• Demolishing of buildings older than 60 years is subjected to approval - National Heritage Resources Act, 1999 (Act No 25 of 1999).</li> <li>• All health and safety aspects will be adhered to.</li> </ul>
<b>Visual Impact</b>	• See mitigation measures as outlined in the table above
<b>Economic</b> - According to the Integrated development Plan (IDP) of the 2 local municipalities, the unemployment rate for across the board ranges between 20 and 35%. Many 'poverty gaps' exist, with informal settlements in the nearby towns. Therefore, depending on the number of employment opportunities to be created, the project could have a significant positive impact in terms of employment (especially for the youth and women).	<p>Local labour and service companies will be used where possible.</p> <ul style="list-style-type: none"> <li>• Prospecting Rights do not supersede property rights hence the applicant will comply with all reasonable requirements to minimise the impact of prospecting on landowners and agricultural activities</li> </ul>

**Table 6: Significance statements and rating of the identified environmental impacts, before and after mitigation**

Potential impacts	Significance rating before mitigation	Significance rating with mitigation
<b>Construction phase</b>		
<b>Fauna and Flora</b> – Clearance of vegetation for establishment of site camp.	Extent: Site Duration: Short-term Intensity: Low Probability: Likely Significance: Medium	Extent: Site Duration: Short-term Intensity: Negligible Probability: Likely Significance: Medium-low
<b>Air Quality</b> - dust creation due to clearance	Extent: Site Duration: Short-term Intensity: Low Probability: Possible Significance: Medium-low	Extent: Site Duration: Short-term Intensity: Low Probability: Unlikely Significance: Low
<b>Operational Phase</b>		
<b>Air Quality</b> – dust creation due to vehicle movement and drilling	Extent: Site Duration: Short-term Intensity: Low Probability: Possible Significance: Medium-low	Extent: Site Duration: Short-term Intensity: Low Probability: Unlikely Significance: Low
<b>Noise pollution</b> – vehicle movement, use of drill rigs and excavation machinery.	Extent: Site Duration: Short-term Intensity: Low	Extent: Site Duration: Short-term Intensity: Low

	Probability: Probable Significance: Medium-low	Probability: Probable Significance: Medium-low
<b>Waste pollution</b> – domestic waste produced by workers.	Extent: Local Duration: Medium-term Intensity: Low Probability: Possible Significance: Medium	Extent: Local Duration: Short-term Intensity: Low Probability: Unlikely Significance: Medium-low
<b>Water pollution</b> (Surface and groundwater) – due to possible spillages, leaks from vehicles or ablution facilities.	Extent: Local Duration: Medium-term Intensity: Low Probability: Probable Significance: Medium	Extent: Local Duration: Short-term Intensity: Low Probability: Unlikely Significance: Low
<b>Soils</b> – soil erosion and pollution due to exposed areas not being managed, leaks or spillages from ablution facilities.	Extent: Local Duration: Medium-term Intensity: Low Probability: Possible Significance: Medium	Extent: Local Duration: Short-term Intensity: Low Probability: Unlikely Significance: Medium-low
<b>Fauna and Flora</b> – disturbance due to clearing and due to uncontrolled vehicle movement.	Extent: Site Duration: Medium-term Intensity: Low Probability: Likely Significance: Medium	Extent: Site Duration: Short-term Intensity: Negligible Probability: Likely Significance: Medium-low
<b>Visual impact</b> – visibility of vehicles and may impact on surrounding land uses where visitors value the undisturbed / untransformed characteristics of the general region	Extent: Site Duration: Short-term Intensity: Negligible Probability: Likely Significance: Low	Extent: Site Duration: Short-term Intensity: Negligible Probability: Likely Significance: Low
<b>Decommissioning/ Rehabilitation phase</b>		
<b>Fauna and Flora</b> – disturbance due to uncontrolled vehicle movement or improper rehabilitation.	Extent: Site Duration: Medium-term Intensity: Low Probability: Possible Significance: Medium	Extent: Site Duration: Short-term Intensity: Negligible Probability: Unlikely Significance: Low
<b>Land degradation</b> – due to improper site clean-up.	Extent: Site Duration: Medium-term Intensity: Low Probability: Possible Significance: Medium	Extent: Site Duration: Short-term Intensity: Negligible Probability: Unlikely Significance: Low
<b>Socio-environmental</b>		
<b>Increase Traffic</b> - During prospecting 4x4 vehicles will be utilizing the existing road network. This may result in the impeding of traffic flow and damage to the existing roads such as the main access road to the proposed development site.	Extent: Local Duration: Short-term Intensity: Low Probability: Possible Significance: Medium	Extent: Local Duration: Short-term Intensity: Negligible Probability: Possible Significance: Medium-low
<b>Nuisance (Air and Noise)</b> - Impacts on air quality will primarily result from increased dust levels associated with the required drilling and pitting. It is anticipated that there will be an increase in noise levels during prospecting which will be associated with the operation of vehicles and drilling and sampling equipment.	Extent: Site Duration: Short-term Intensity: Low Probability: Probable Significance: Medium-low	Extent: Site Duration: Short-term Intensity: Low Probability: Probable Significance: Medium-low

Potential impacts	Significance rating before mitigation	Significance rating with mitigation
<b>Water pollution (Ground and surface water)</b> - Various substances may result in the pollution of surface and groundwater sources. Pollution from litter and general wastes may occur due to improper site management. Washing down of vehicles and equipment may result in the pollution of groundwater, and pollution may occur from poor vehicle maintenance and improper storage of hazardous materials such as fuel, etc.	Extent: Local Duration: Medium-term Intensity: Low Probability: Probable Significance: Medium	Extent: Local Duration: Short-term Intensity: Low Probability: Unlikely Significance: Low
<b>Socio economic</b>		
<b>Cultural environment</b> - The project could possibly have an impact on farm owners' sense of place, as the project will alter the landscape temporarily. The project could have an impact on cultural heritage values, as well as heritage artefacts if these are found within the area.	Extent: Site Duration: Short-term Intensity: Moderate Probability: Unlikely Significance: Low	Extent: Site Duration: Short-term Intensity: Low Probability: Rare Significance: Low
<b>Visual Impact</b> – disturbance to sense of place, visibility of vehicles to landowner as well as other visitors	Extent: Site Duration: Short-term Intensity: Negligible Probability: Likely Significance: Low	Extent: Site Duration: Short-term Intensity: Negligible Probability: Likely Significance: Low

Based on the nature of the prospecting activities, there are no cumulative impacts anticipated.

**i) 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).

The criteria for the description and assessment of environmental impacts were drawn from the EIA Guidelines (DEAT, Environmental Impact Assessment Guidelines., 1998) and as amended from time to time (DEAT, Impact Significance, Integrated Environmental Management, Information series 5., 2002). The level of detail as depicted in the EIA Guidelines (DEAT, Environmental Impact Assessment Guidelines., 1998) (DEAT, Impact Significance, Integrated Environmental Management, Information series 5., 2002)) was fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed, it was necessary to establish a rating system, which was applied consistently to all the criteria. For such purposes each aspect was assigned a value, ranging from one (1) to five (5), depending on its definition. This assessment is a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

An explanation of the impact assessment criteria is defined below

**Table 7: Impact Assessment Criteria**

Assessment	Definition	Quantification				
		1	2	3	4	5
<b>Environment Type</b>	Type of environment anticipated to be impacted	Degraded sites/ heavy industrial areas/ high density townships	High density residential/ retail and office complexes/ central business districts industrial/ large- scale agriculture <sup>1</sup>	Medium density residential/ light industrial/ office parks/ sports facilities medium- scale agriculture <sup>2</sup>	Low density residential/ small- scale agricultural <sup>3</sup> / small holdings	Greenfield sites/ nature reserves/ protected areas/ natural recreational facilities
<b>Intensity</b>	The potential of the impact to cause harm	Negligible Impact	Minor Impact	Moderate Impact	High Impact	Severe/ Irreversible
<b>Extent</b>	The spatial extent or population extent of an impact	Within project area (<500m from project)	Surrounding area (500m – 1km radius)	Outside project area (1 – 5km radius)	Regional and provincial (5 – 50km radius)	National or international (>50km radius)
<b>Duration</b>	The period the impact will interact with the receiving environment	Immediate (days)	Short term (weeks)	Medium term (months)	Long term (years)	Beyond life of project
<b>Probability</b>	The likelihood of the impact occurring	Rare	Unlikely	Possible	Likely	Almost certain

**Table 8: Significance Matrix**

Likelihood	Consequence				
	2 – 6	5 – 8	9 – 11	12 – 15	14 – 17
	5 – 8	9 – 11	12 – 15	14 – 17	18 – 21
	9 – 11	12 – 15	14 – 17	18 – 21	20 – 23
	12 – 15	14 – 17	18 – 21	20 – 23	24 – 27
	14 - 17	18 - 21	20 - 23	24 - 27	26 - 30

**Table 9: Significance Rating**

Environmental Significance	Description of Rating
2 – 8	Low Significance No specific management action required
9 – 11	Medium-low Significance Administrative management actions required
12 – 17	Medium Significance Management and monitoring action plans required
18 – 23	Medium-high significance Specific management and monitoring plans required
24 - 30	High Significance Detailed management and monitoring plans required, potential red flag impact

Risk assessment involves the calculation of the magnitude of potential consequences (levels of impacts) and the likelihood (levels of probability) of these consequences to occur. Risk = Consequence + Likelihood; where:

- (i) likelihood is the probability of occurrence of an impact that affects the environment; and,
- (ii) consequence is the environmental impact if an event occurs.

Consequence can be calculated as the sum of the risk levels comprising environment type, nature, extent and duration of the potential impact. Likelihood can be calculated as the sum of the risks of frequency and probability of the impact occurring. The likelihood and consequence can input into a matrix in order to identify the significance of the risk occurring.

The C + L matrix method therefore combines the scores from the qualitative or semi-quantitative ratings of consequence (levels of impact) and the likelihood (levels of probability) that a specific consequence will occur (not just any consequence) to generate a risk score and risk rating.

**i) 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 preferred location is the only location plan currently under investigation. Due to the location and presence of the potential mineral resources, the initial site layout is the only alternative considered; however, as prospecting progresses through the aforementioned phases, the preliminary site layout may be slightly adjusted. The final locations of the drill holes can only be established once the geophysical survey has been completed in the non-invasive phases of the activity and once agreements has been discussed and signed with the relevant landowners. This can only be done once the Prospecting Right has been approved. Until such time the preliminary layout remains the preferred layout.

The identified potential impacts range from air pollution such as dust, noise pollution, soil pollution, waste pollution, water pollution, fauna and flora impacts, surface water impacts, visual impacts and socio-economic impacts. All these will be properly managed. None of these impacts will be significant since the proposed prospecting activities will be of small scale, short term, mitigation measures will be adhered to and concurrent rehabilitation will take place. Refer to the tables above which review the significance of impacts by taking the proposed mitigation measures into consideration.

All anticipated impacts with the relevant mitigation measures have been included in the section above – Table 7 to Table 9.

The following concerns in terms of the site layout were raised to date (summary) followed by short description of how these issues have been addressed:

- Safety and logistics concerns, i.e. site clearance and site camp set up, duration of prospecting activities, number of employees and vehicles on site, accommodation for employees and safety and security protocols: Please note that should an authorisation be granted for prospecting access agreements will be put in place with the landowners that will stipulate these aspects.
- Impacts to existing gravel roads to be used for access: Rehabilitation will be done in such a manner that the site is in the original state prior to prospecting. The Rehabilitation process is outlined in this report. The prospecting contractor will also be responsible for any repairs to roads caused by its activities.

- Concerns regarding noise impacts: Proposed mitigation measures were outlined and included in the relevant sections of this report
- Impact of dust pollution: Proposed mitigation measures were outlined and included in the relevant sections of this report, including dust suppression.
- Rehabilitation of areas disturbed by prospecting activities: Rehabilitation will be done in such a manner that the site is in the original state prior to prospecting. The Rehabilitation process is outlined in this report.
- Impacts to the natural environment, including fauna and flora, rivers and wetlands: Proposed mitigation measures were outlined and included in the relevant sections of this report.
- Impacts to groundwater quality and quantity: A specialist opinion stating that the prospecting activities will not have an impact on groundwater quantity and quality. Proposed mitigation measures for water quality impacts were outlined and included in the relevant sections of this report.

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

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

Refer to section (vii) above for a list of concerns raised and how these issues were addressed and accommodated in the layout plan. The mitigation measures related to the concerns include but are not limited to:

**Access agreements, safety and accommodation:**

- Landowners will be informed of all activities to be undertaken on site as soon as the information becomes available. Please note that should an authorisation be granted for prospecting access agreements will be put in place with the landowners that will stipulate these aspects.
- The access routes required will be made available to all I&APs once the locations of the final boreholes have been established and this can only be done once the geophysical survey has been completed. All final locations will be discussed with the relevant landowners and the client shall endeavour to accommodate them on the precise location of holes within the area where practical.

**Air pollution**

- Dust abatement by wetting down exposed areas at drill and camp sites where required.
- Vehicles will stay on the approved or available tracks as far as practically possible.
- Low speed limits will be set to avoid the creation of dust (40km/hr).
- All the equipment and vehicles will be equipped with the manufactures stock standard exhaust systems which will minimise the amount of emissions and noise from their engines.
- No burning of waste will be allowed on site.
- Fire extinguishers and other fire safety equipment will be available.
- Drilling locations as set out by the final layout plan will be adhered to
- Excavations and other clearing activities will only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.
- Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.



**Noise pollution**

- The activities will comply with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996) and its regulations as well as other applicable legislations regarding noise control.
- All work will be limited to daylight hours i.e. between 6am and 6pm.

**Water pollution**

- All preliminary drill hole locations are placed to NOT occur within these buffer zones.
- Limited amounts of water (approximately 2000 litres / day) will be used during drilling. Water will be trucked to site.
- Ablution facilities will not be placed within 100 m of any water body.

**Fauna and flora**

- Only demarcated areas for drilling will be cleared to the minimum level required for access and adjacent and/or other areas will not be disturbed. No trees will be removed.
- Place temporary facilities on already disturbed land as far as possible to limit impacts on vegetation.
- No firewood harvesting will be allowed.
- No fires will be made on site. Cooking will only be allowed on gas-stoves at designated areas.
- No hunting will be allowed.
- All equipment will be removed from site.
- No cigarette butts may be disposed of on the relevant properties.
- Should it be required that vegetation, outside of the disturbed agricultural land be removed, an appropriate specialist should be consulted prior to any disturbance of the vegetation.
- Rehabilitation will be done in such a manner that the site is in the original state prior to prospecting.

**Rehabilitation**

- Prior to rehabilitation of the site, all remnants of foreign debris shall be removed from the site.
- All holes will be covered first with subsoil and then with topsoil (minimum of 10cm deep). Topsoil will be spread to the original depth (30cm where possible).
- As topsoil will contain all cleared vegetation, no additional treatment will be required.
- The soil must cover all the roots and be well firmed down to a level equal to that of the surrounding in situ material.
- Control weeds by means of extraction, cutting or other approved methods.
- Monitoring will be undertaken once a month or until rehabilitation has been deemed successful.
- Follow up inspections will be conducted every two months to remove upcoming seedlings of alien vegetation.
- A single permanent marker will be required to mark the location of the drill hole for future reference. The construct of the marker shall be cleared with the landowner.
- All rehabilitation referred to in this environmental management programme will be done concurrent to prospecting operations as set out in the MPRDA. Best practice methods will be used.

**i) Motivation where no alternative sites were considered.**

No location alternatives were identified as the location of the proposed activities are determined on initial assessment of the geological data available which has determined that the area in question may have the proposed minerals iron ore. The location of the drilling sites may be varied once the non-invasive activities have been completed and can be used to inform more appropriate locations for drill sites. Other than existing geological data, the current locations of the drill sites were chosen where they are at least 100 m from the nearest dwelling, 100 m away from any watercourses or wetlands, access roads are available and not on sensitive sites (i.e. land currently or recently used for agricultural activities).

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

Refer to section (i) above. Each phase is dependent on the preceding phase and results thereof. The preferred location is thus the only location assessed. It should be noted that prospecting is a “locality bound” industry (it has to take place where the resources are) thus no alternative locations for prospecting can be assessed. However, alternative locations for infrastructural components of the project that are not locality bound can be considered. In this case however, the only infrastructural component of the proposed project is the location of the site camp. This location for this will be dependent upon landowner negotiations and thus as a result cannot be determined prior to the prospecting right being granted. Until such time the preliminary layout remains the preferred layout. The preliminary locations have however allowed for safe buffers around sensitive identified features.

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

Refer to section : (i) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

Refer to section (v), Table 7 and Table 8 for the significance statements of each identified impact All impacts were identified by a combination of the following:

- Desktop analysis;
- Specialist investigation (Heritage Assessment);
- Consultation process with landowners and I&APs; and
- A site visit.

**j) Assessment of each identified potentially significant impact and risk**

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

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYP	SIGNIFICANCE
<b>Phase 1-3: Non-invasive prospecting</b>	Reduce environmental impact through proper planning	Environmental	Planning	N/A	N/A	N/A
<b>Phase 4 and 5: Invasive Prospecting (5 drill holes spread over 2 phases)</b>						
Vegetation clearing for drill sites, site camp and storage area	Fauna and Flora – Clearance of vegetation for establishment of site camp	Environmental and social	Construction and Operational	Medium	<ul style="list-style-type: none"> <li>• The drill/site camp will be placed in a disturbed area that will limit impacts on vegetation.</li> <li>• No firewood harvesting will be allowed.</li> <li>• No fires will be made on site. Cooking will only be allowed on gas-stoves at designated areas.</li> <li>• No hunting will be allowed.</li> <li>• Should any protected tree or plant species be found on site, it will be avoided and a safe buffer (10-15 m) distance placed around it. If for any reason it cannot be avoided, the relevant permits will be applied for prior to removal.</li> </ul>	Medium-low
	Air Quality - dust creation due to clearance	Environmental and social	Construction and Operational	Medium-low	Dust abatement by wetting down exposed areas at drill and/or camp site, where required.	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE If not mitigated	MITIGATION TYPE	SIGNIFICANCE
Drilling Procedures	Air quality – dust creation due to vehicle movement and drilling	Environmental and social	Operational	Medium-low	<ul style="list-style-type: none"> <li>• Dust abatement by wetting down exposed areas at drill and/or camp sites will be required.</li> <li>• Vehicles will stay on the approved or available tracks as far as practically possible.</li> <li>• Low speed limits will be set to avoid the creation of dust (40 km/hr).</li> <li>• All the equipment and vehicles will be equipped with the manufactures stock standard exhaust systems which will minimise the amount of emissions from their engines.</li> <li>• No burning of waste will be allowed on site.</li> <li>• Fire extinguishers and other fire safety equipment will be available on site.</li> <li>• Drilling locations as set out by the final layout plan and as discussed with the relevant landowners will be adhered to.</li> <li>• Excavations and other clearing activities will only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.</li> <li>• Any complaints or claims emanating from the lack of dust control shall be attended to</li> </ul>	Low

					<p>immediately by the Project Geologist and Drilling Contractor.</p> <ul style="list-style-type: none"> <li>• All areas will be rehabilitated immediately upon conclusion of work conducted.</li> </ul>	
	Noise pollution – vehicle movement, use of drill rigs and excavation machinery	Environmental and social	Operational	Medium-low	<ul style="list-style-type: none"> <li>• The activities will comply with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996) and its regulations as well as other applicable legislations regarding noise control.</li> <li>• Employees will be supplied with ear plugs. All prospecting vehicles will be maintained in a road worthy condition.</li> <li>• All work will be limited to daylight hours, i.e. between 6am and 6pm</li> </ul>	
	Waste pollution – domestic waste produced by workers	Environmental and social	Operational	Medium	<ul style="list-style-type: none"> <li>• Bins will be emptied on a regular basis.</li> <li>• Domestic waste to be removed from site - no burying or burning of domestic waste will be allowed.</li> <li>• Ablution facilities will be regularly serviced.</li> </ul>	Medium-low
	Water pollution (Surface and groundwater, wetlands and water bodies) – due to possible spillages, leaks from vehicles or ablution facilities	Environmental and social	Operational	Medium	<ul style="list-style-type: none"> <li>• Prospecting activities will not be conducted within 100 m of a watercourse or wetland. Should this become a requirement, the relevant permits will be obtained from DWS prior to drilling taking place. All preliminary drill hole locations are placed to <b>NOT</b> occur within these buffer zones.</li> </ul>	

					<ul style="list-style-type: none"> <li>• Limited amounts of water (approximately 2000 litres / day) will be used during drilling. Water will be trucked to site.</li> <li>• Ablution facilities will not be placed within 100 m of any water body.</li> <li>• No construction footprint will take place inside or within 100 meters of any water body or wetland.</li> </ul> <p><b>Hazardous materials</b></p> <ul style="list-style-type: none"> <li>• All storage tanks containing hazardous materials will be placed in bunded containment areas with sealed surfaces.</li> <li>• The bund wall must be high enough to contain 110% of the total volume of the stored hazardous material with an additional allocation for potential high runoff storm water events.</li> <li>• Any hazardous substances will be stored at least 100 m from any of the water bodies on site.</li> <li>• Contaminated wastewater will be managed by the Contractor to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp will be collected and removed from the site for appropriate disposal at a licensed commercial facility</li> </ul>	
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NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE If not mitigated	MITIGATION TYPE	SIGNIFICANCE
	Soils – soil erosion and pollution due to exposed areas not being managed, leaks or spillages from ablution facilities	Environmental and social	Operational	Medium	<ul style="list-style-type: none"> <li>• Dust abatement by wetting down exposed drill site and camp areas will be required.</li> <li>• Stockpiles will be below the 1.5 m height restriction.</li> <li>• The use of oil drip trays under drilling equipment to ensure no spillage of oils and fuels onto the ground.</li> <li>• Where possible, no major vehicle repairs will be done on site.</li> <li>• Oils and fuel will be stored on bounded areas to avoid spillages.</li> <li>• Any spillages which may occur will be investigated and immediate action will be taken. In the event of significant spills (in excess of 35 litres) of any hazardous substance, this will be recorded and reported to the environmental personnel, Department of Water and Sanitation, DMR and any other relevant authorities. In such cases the contaminated soil will be excavated and disposed at a suitably licensed and registered landfill.</li> <li>• An emergency plan for spillages will be available on site.</li> <li>• Storm water runoff in and around drill holes will be controlled.</li> <li>• Keep equipment and vehicles within the limits of the initially</li> </ul>	Medium-low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE If not mitigated	MITIGATION TYPE	SIGNIFICANCE
	Fauna and Flora – due to uncontrolled vehicle movement or improper rehabilitation	Environmental and social	Operational	Medium	<ul style="list-style-type: none"> <li>• Only demarcated areas for drilling will be cleared to the minimum required for access and adjacent and/or other areas will not be disturbed.</li> <li>• No firewood harvesting will be allowed.</li> <li>• No fires will be made on site. Cooking will only be allowed on gas-stoves at designated areas.</li> <li>• No hunting will be allowed.</li> <li>• No cigarette butts will be disposed of on the relevant properties.</li> <li>• Should any protected tree or plant species be found on site, it will be avoided and a safe buffer (10-15 m) distance placed around it. If for any reason it cannot be avoided, the relevant permits will be applied for prior to removal.</li> <li>• Vehicles will remain on approved tracks.</li> <li>• See rehabilitation mitigation measures.</li> </ul>	Medium-low
	Fire prevention	Environmental and social	Operational	Low	<ul style="list-style-type: none"> <li>• The Drilling Contractor will have operational fire- fighting equipment</li> </ul>	Low



					available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process. <ul style="list-style-type: none"> <li>• See mitigation measures for Fauna and Flora above.</li> </ul>	
	Erosion	Environmental and social	Operational	Low	<ul style="list-style-type: none"> <li>• Wind screening and storm water control will be undertaken to prevent soil loss from the site.</li> <li>• All erosion control mechanisms will be regularly maintained.</li> <li>• Re-vegetation of disturbed surfaces will occur immediately after the construction and prospecting activities are completed.</li> <li>• Rehabilitation will be undertaken progressively</li> </ul>	
	Visual impact – may impact on surrounding land uses where visitors value the characteristics of the general region and due to the visibility of vehicles	Environmental and social	Operational	Low	<ul style="list-style-type: none"> <li>• Visual impacts will be of a temporary nature and unfortunately cannot be mitigated.</li> </ul>	Low
	Cultural and Heritage Artefacts	Environmental and social	Construction and Operational	Low	<ul style="list-style-type: none"> <li>• Local museums as well as the South African Heritage Resource Agency (SAHRA) will be informed if any artefacts are uncovered in the affected area and mitigation measures recommended by SAHRA will be followed.</li> <li>• The contractor will ensure that his</li> </ul>	

					<p>workforce is aware of the necessity of reporting any possible historical or archaeological finds to the ECO so that appropriate action can be taken.</p> <ul style="list-style-type: none"> <li>• Any discovered artefacts will not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted.</li> <li>• Drill sites are to be positioned to not impact on any identified sites heritage significance.</li> </ul>	
Social impacts of drilling activities	Increase Traffic - During prospecting 4x4 vehicles will be utilizing the existing road network. This may result in the impeding of traffic flow and damage to the existing roads such as the main access roads to the proposed development site	Social	Operational	Medium	<ul style="list-style-type: none"> <li>• Warning signage will be erected at all intersections, including at the intersections with farm access roads.</li> <li>• Heavy vehicles will not travel the road between 10pm and 6am unless it is absolutely unavoidable and has been discussed with the relevant landowner.</li> <li>• Sufficient distance will be maintained between heavy vehicles to allow light vehicles to overtake safely.</li> <li>• All drivers will be made aware of the procedures to be followed if an accident occurs.</li> <li>• If any damage to gravel roads occur as result of drilling, the damage will either be compensated for or repaired.</li> </ul>	Medium-low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE If not mitigated	MITIGATION TYPE	SIGNIFICANCE
	<p>Nuisance (Air and Noise)</p> <p>- Impacts on air quality will primarily result from increased dust levels associated with the required drilling.</p> <p>It is anticipated that there will be an increase in noise levels during prospecting which will be associated with the operation of vehicles, drilling and sampling equipment.</p>	Social	Operational	Medium-Low	See mitigation measures as outlined above	Medium - low
	<p>Water pollution (Ground and surface water) - Various substances may result in the pollution of surface and groundwater sources. Pollution from litter and general wastes may occur due to improper site management. Washing down of vehicles and</p>	Social	Operational	Medium	See mitigation measures as outlined above.	Low

	equipment may result in the pollution of groundwater, and pollution may occur from poor vehicle maintenance and improper storage of hazardous materials such as fuel ect					
NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE If not mitigated	MITIGATION TYPE	SIGNIFICANCE
	Cultural environment - The project could possibly have an impact on farm owners' sense of place as the project will alter the landscape (short-term); The project could have an impact on cultural heritage values, as well as heritage artefacts if these are found within the area.	Social	Operational		<ul style="list-style-type: none"> <li>• The applicant will, before commencing any prospecting activity, ascertain whether the designated site does not include a heritage site.</li> <li>• Any heritage sites/artefacts found will be reported to SAHRA.</li> <li>• National heritage sites will not be destroyed, damaged, excavated, altered, or defaced without a permit.</li> <li>• Demolishing of buildings older than 60 years is subjected to approval - National Heritage Resources Act, 1999 (Act No 25 of 1999).</li> <li>• All health and safety aspects will be adhered to.</li> </ul>	Low
	Economic	Social	Operational	Low Positive	<ul style="list-style-type: none"> <li>• Local labour and service companies will be used where possible.</li> <li>• Prospecting Rights do not supersede property rights hence the applicant will comply with all reasonable requirements to minimise the impact of prospecting</li> </ul>	Low Positive

					on landowners and agricultural activities.	
Decommissioning and Rehabilitation						
NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE If not mitigated	MITIGATION TYPE	SIGNIFICANCE
Closure of boreholes and rehabilitation of sites	Fauna and Flora – due to uncontrolled vehicle movement or improper rehabilitation	Environmental	Closure and Decommissioning	Medium	<ul style="list-style-type: none"> <li>• Mitigation measures as per Part B (EMPr) of this report will be adhered to.</li> <li>• Site activities will be restricted to daylight hours between 6am and 6pm and as per the agreement with the landowner/s.</li> <li>• Vehicles will remain on the existing tracks.</li> <li>• Prospecting activities will not be conducted within 100 m of pens and stalls.</li> <li>• All equipment will be removed from site.</li> <li>• Rehabilitation will be done in such a manner that the site is in the state prior to prospecting.</li> <li>• All structures comprising the drilling camp will be removed from site.</li> <li>• The area that housed the drilling camp will be checked for spills of substances such as oil, paint, etc., and these will be cleaned up and contaminants disposed of appropriately.</li> </ul>	Low
	Land degradation – due to improper site clean-up	Environmental	Closure and Decommissioning	Medium	<ul style="list-style-type: none"> <li>• All waste bins and domestic waste will be removed from site once the activity is complete.</li> <li>• Excess topsoil not used in</li> </ul>	Low

					<p>rehabilitation will be levelled.</p> <ul style="list-style-type: none"><li>• All equipment will be removed from site on completion of the activity.</li><li>• All areas where temporary services were installed will be rehabilitated to the satisfaction of the ECO.</li><li>• The site will be cleared of all litter.</li><li>• Final inspection in order to ensure adherence to EMPr guidelines, completion of localised/ remaining areas of impact, monitoring of rehabilitation success, etc.</li></ul>	
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**j) Summary of specialist reports.**

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

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
<i>None</i>	<i>None- No specialist studies required for the prospecting application as there will be no adverse impact on the environment</i>	<i>None</i>	<i>None</i>

## k) Environmental impact statement

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

This Basic Assessment illustrates that there are few potential negative and positive impacts that may arise as a result of the proposed prospecting activities. The main impact is associated with the stripping of soil limited on the drilling site and streams on site.

No impacts which could cause detrimental harm to the environment were identified as part of this assessment. The prescribed mitigation measures proposed as part of this report should be followed.

The impact of the prospecting activities is regarded as low after the implementation of the management plan

### ii) Final Site Map

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

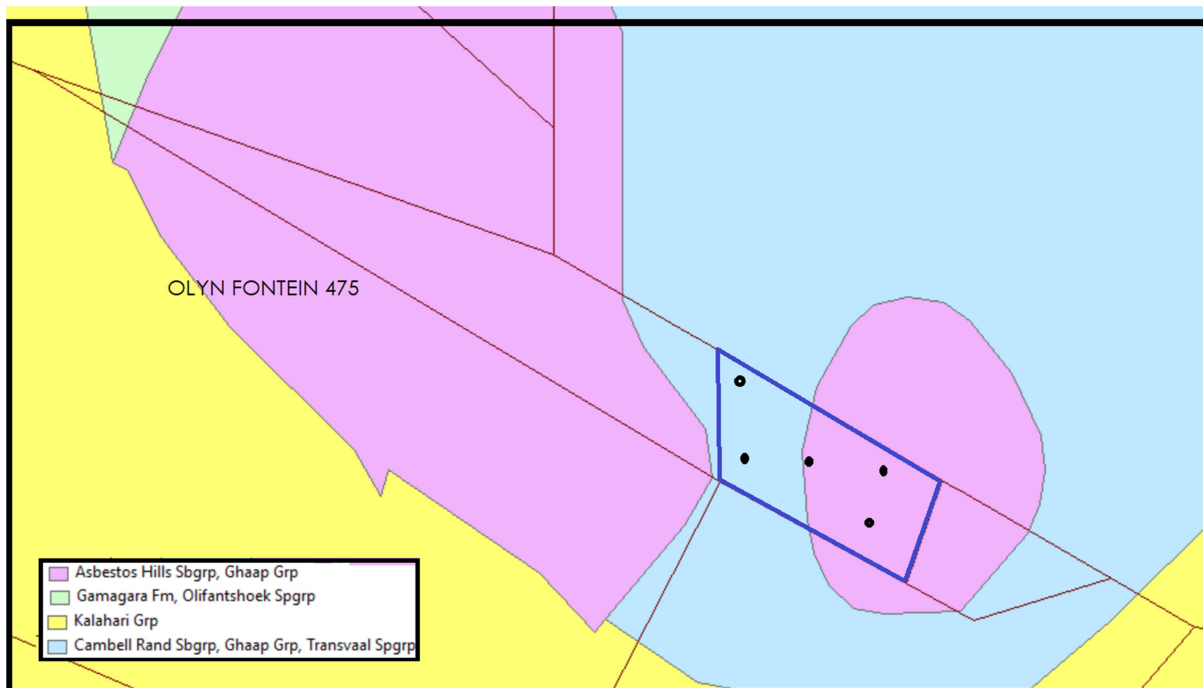


Figure 8: Map showing the drill sites



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

The identified potential impacts for the preferred alternative range from air pollution such as dust, noise pollution, soil pollution, waste pollution, water pollution, fauna and flora impacts, visual impacts and socio-economic impacts. All these will be properly managed. None of these impacts will be significant since the proposed prospecting activities will be of small-scale, short-term, mitigation measures will be adhered to and concurrent rehabilitation will be practiced. Please refer to Table 8, Table 9, Table 10 and Table 11 which reviews the significance of impacts by taking the proposed mitigation measures into consideration.

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

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

The objectives of the impact management process are as follows:

#### **Air pollution**

- Dust abatement by wetting down exposed areas at drill and camp sites where required.
- Vehicles will stay on the approved or available tracks as far as practically possible.
- Low speed limits will be set to avoid the creation of dust (40km/hr).
- All the equipment and vehicles will be equipped with the manufactures stock standard exhaust systems which will minimise the amount of emissions and noise from their engines.
- No burning of waste will be allowed on site.
- Fire extinguishers and other fire safety equipment will be available.
- Drilling locations as set out by the final layout plan will be adhered to.
- Excavations and other clearing activities will only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.
- Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.

#### **Noise pollution**

- The activities will comply with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996) and its regulations as well as other applicable legislations regarding noise control.
- Employees will be supplied with ear plugs. All prospecting vehicles will be maintained in a road worthy condition.
- All work will be limited to daylight hours i.e. between 6am and 6pm.

### **Waste pollution**

- Bins will be emptied on a regular basis
- No burying and/or burning of waste is allowed.
- All waste bins and domestic waste will be removed from site on a regular basis

### **Water pollution**

- Prospecting activities will not be conducted within 100 m of a watercourse or a wetland.
- Limited amounts of water (approximately 2000 litres / day) will be used during drilling. Water will be trucked to site.
- Ablution facilities will not be placed within 100 m of any water body.
- No construction footprint will be placed inside or within 100 m of any water body or wetland. A SACNASP Registered Wetland Specialist should be consulted when determining the final drill hole localities

### **Hazardous materials**

- Use and /or storage of materials, fuels and chemicals which could potentially leak into the ground will be controlled in a manner that prevents such occurrences.
- All storage tanks containing hazardous materials will be placed in bunded containment areas with sealed surfaces.
- The bund wall will be high enough to contain 110% of the total volume of the stored hazardous material with an additional allocation for potential high runoff storm water events.
- Any hazardous substances will be stored at least 100m from any of the water bodies on site.
- Contaminated wastewater will be managed by the Contractor to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp will be collected and removed from the site for appropriate disposal at a licensed commercial facility.

### **Soil pollution**

- Dust abatement by wetting down exposed drill site and camp areas where required.
- Stockpiles will be below the 1.5m height restriction.
- The use of oil drip trays under drilling equipment to ensure no spillage of oils and fuels onto the ground.
- Where possible, no major vehicle repairs will be done on site.
- Oils and fuel will be stored on bunded areas to avoid spillages.
- Any spillages which may occur will be investigated and immediate action will be taken. In the event of significant spills (in excess of 35 litres) of any hazardous substance, this will be recorded and reported to the environmental personnel, Department of Water and Sanitation, DMR and any other relevant authorities. In such cases the contaminated soil will be excavated and disposed at a suitably licensed and registered landfill.

- An emergency plan for spillages will be available on site.
- Storm water runoff in and around drill holes will be controlled.
- Wind screening and storm water control will be undertaken to prevent soil loss from the site.
- All erosion control mechanisms will be regularly maintained.
- Re-vegetation of disturbed surfaces will occur immediately after the construction and prospecting activities are completed.
- Rehabilitation will be undertaken progressively

### **Fauna and Flora**

- Only demarcated areas for drilling will be cleared to the minimum level required for access and adjacent and/or other areas will not be disturbed. No trees will be removed.
- Should it be required that vegetation, outside of the disturbed agricultural land be removed, an appropriate specialist should be consulted prior to any disturbance of the vegetation.
- Place temporary facilities on already disturbed land as far as possible to limit impacts on vegetation.
- No firewood harvesting will be allowed.
- No fires will be made on site. Cooking will only be allowed on gas-stoves at designated areas.
- No hunting will be allowed.
- All equipment will be removed from site.
- No cigarette butts may be disposed of on the relevant properties.
- Rehabilitation will be done in such a manner that the site is in the original state prior to prospecting.

### **Rehabilitation**

- Prior to rehabilitation of the site, all remnants of foreign debris shall be removed from the site.
- All holes will be covered first with subsoil and then with topsoil (minimum of 10cm deep). Topsoil will be spread to the original depth (30cm where possible).
- As topsoil will contain all cleared vegetation, no additional treatment will be required.
- The soil must cover all the roots and be well firmed down to a level equal to that of the surrounding in situ material.
- Control weeds by means of extraction, cutting or other approved methods.
- Monitoring will be undertaken once a month or until rehabilitation has been deemed successful.
- Follow up inspections will be conducted every two months to remove upcoming seedlings of alien vegetation.
- Continued monitoring throughout the life of the project will be required as the risk of alien plant species invasion is never eliminated.

- A single permanent marker will be required to mark the location of the drill hole for future reference.

The siting of such a marker shall be cleared with the landowner.

- All rehabilitation referred to in this environmental management programme will be done concurrent to prospecting operations as set out in the MPRDA. Best practice methods will be used.
- Continuous monitoring of possible soil erosion will be required.

### **Cultural/Heritage**

- The applicant will before commencing any prospecting activity, ascertain whether the designated site does not include a heritage site.
- Any heritage sites/artefacts found will be reported to SAHRA.
- National heritage sites will not be destroyed, damaged, excavated, altered, or defaced without a permit.
- Demolishing of buildings older than 60 years is subjected to approval - National Heritage Resources Act, 1999 (Act No 25 of 1999).
- Invasive activities will not be allowed within 100m from farm houses.
- Local museums as well as the South African Heritage Resource Agency (SAHRA) will be informed if any artefacts are uncovered in the affected area and mitigation measures recommended by SAHRA should be followed.
- The contractor will ensure that his workforce is aware of the necessity of reporting any possible historical or archaeological finds to the ECO so that appropriate action can be taken.
- Any discovered artefacts will not be removed under any circumstances. Any destruction of a site will only be allowed once a permit is obtained and the site has been mapped and noted.

### **Socio-economic**

- Local labour and service companies will be used where possible.
- Prospecting Rights do not supersede property rights hence the applicant will comply with all reasonable requirements to minimize the impact of prospecting on landowners and agricultural activities
- All relevant mitigation measures as set out in Table 6 above.

### **Environmental Training**

- All site personnel will have a basic level of environmental awareness training. Topics covered should include;
  - o What is meant by “Environment”
  - o Why the environment needs to be protected and conserved
  - o How construction and prospecting activities can impact on the environment

- o What can be done to mitigate against such impacts
  - o Awareness of emergency and spills response provisions
  - o Social responsibility during construction and prospecting e.g. being considerate to local residents
- The need for a “clean site” policy also needs to be explained to the workers.

### **m) Aspects for inclusion as conditions of Authorisation.**

Any aspects which must be made conditions of the Environmental Authorisation

- Boreholes and access tracks to be located in areas that will result in minimal ground disturbance
- During the planning phase for each borehole, specific controls must be identified and implemented, based on site conditions
- A field survey must be undertaken before drilling commences at each drilling site to confirm that no threatened species, cultural heritage site, ecologically sensitive areas or conservation areas are present in sections to be cleared
- No employees will be permitted to stay on the site.
- Collection of firewood will not be allowed.
- Where an access road is needed, the relevant occupant and owner will be consulted prior to the development of that access to ensure that consensus is reached on the matter and the access will be rehabilitated at the end of the drilling programme

### **n) Description of any assumptions, uncertainties and gaps in knowledge.**

(Which relate to the assessment and mitigation measures proposed)

- Due to the nature of the activities (small scale and short term) the site was not subjected to an Ecological, Surface Water, Geohydrological Assessment, etc.
- The final drill hole layout can only be finalised on completion of the non-invasive phases of the programme and after agreements have been signed with the relevant landowners.

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

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

This is a proposed prospecting application to determine the value of the chromite mineral. The holes will be drilled to a maximum depth of 100m and will only be 60 - 75.7 mm in size.

Drilling will have low impact on existing activities and is not expected to impact on unidentified heritage artefacts. No permanent structures or infrastructure will be required on site.

No workers will be required to stay site and no site camp will be required. Rehabilitation will be done concurrently with prospecting. After drilling, when each site is left, a clearing team will restore the site and monitor its recovery. Any completed hole that is not required for groundwater monitoring, will be sealed with cement to prevent groundwater contamination.

Compacted areas (access roads, stockpile storage areas) will be scarified to a depth of 600 mm and topsoil cover will be restored. Indigenous vegetation will be planted on the site. Remaining refuse, chemicals, fuels and waste materials will be removed from the site following the completion of the prospecting programme.

Such waste will be disposed of to an approved landfill. An inspection on whether there is evidence of weeds or pest invasion as a result of prospecting activities will be undertaken and appropriate remediation actions will be implemented if required

**ii. Conditions that must be included in the authorisation**

- Boreholes and access tracks to be located in areas that will result in minimal ground disturbance
- During the planning phase for each borehole, specific controls must be identified and implemented, based on site conditions
- No employees will be permitted to stay on the site unless there is prior arrangement with the land owner
- Collection of firewood and hunting will not be allowed.
- Where an access road is needed, the relevant occupant and owner will be consulted prior to the development of that access to ensure that consensus is reached on the matter and the access will be rehabilitated at the end of the drilling programme

**p) Period for which the Environmental Authorisation is required.**

5 Years

### 3 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.

Bohlale Family Trust herewith confirm both its capacity and willingness to make the financial provision required available should the prospecting right be granted.

### 4 Financial Provision

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

CALCULATION OF THE QUANTUM							
Applicant: BOHLALE FAMILY TRUST				Ref No.: NC30/5/11/212383 PR			
No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	14,05	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	195,76	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	288,49	1	1	0
3	Rehabilitation of access roads	m2	50	35,03	1	1	1751,5
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	340,01	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	185,46	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	391,53	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	205242,16	1	1	0
7	Sealing of shafts adits and inclines	m3	0	105,09	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,05	136828,1	1	1	6841,405
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	170416,93	1	1	0
8 ( C )	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	494971,55	1	1	0
9	Rehabilitation of subsided areas	ha	0	114572,93	1	1	0
10	General surface rehabilitation	ha	0,05	108390,94	1	1	5419,547
11	River diversions	ha	0	108390,94	1	1	0
12	Fencing	m	0	123,64	1	1	0
13	Water management	ha	0	41213,28	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0,05	14424,65	1	1	721,2325
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
Sub Total 1							1473,6845
1	Preliminary and General		1768,04214	<b>weighting factor 2</b>			1768,04214
						1	
2	Contingencies			1473,36845			1473,36845
Subtotal 2							17975,10
VAT (15%)							2696,26
<b>Grand Total</b>							<b>20671</b>

**i) Explain how the aforesaid amount was derived.**

Financial provision has been calculated according to the regulation 54 of the MPRDA and the principles presented in the guidelines for the determination of financial provision for the mining industry (2005) – and only aspects applicable to prospecting through exploration drilling up to de-establishment are addressed in the financial provision assessment.

The primary risk ranking of the overall prospecting activities was determined as class C. The overall environmental sensitivity of the proposed project site was defined as being medium, based on the disturbed nature of the proposed project site by agricultural activities. Weighing factor 1 was defined as 1.00 based on the terrain and weighing factor 2 was defined as 1.05 due to the proximity to an urban area.

The rates used in the assessment are based on the original 2005 rates included in the guideline, with these rates inflated by the Consumer Price Index (CPI) as published by Inflation World Wide until 2018.

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

The financial support for Bohlale Family Trust proves the financial ability to undertake prospecting the desired mineral.

**5 Specific Information required by the competent Authority**

**iv) 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 drill hole will be closed immediately and will not be bigger than 60 mm in size. Should the prospecting right be granted further consultation with the land occupier and owner will be done. Outcomes of the consultation will determine whether in depth investigation will be required.



**(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.** (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

No specialist investigation has been conducted.

**6 Other matters required in terms of sections 24(4)(a) and (b) of the Act.**

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

The prospecting Right is for determining the ore reserve on the portion of the farm applied for and therefore no alternative to the location, technology and activities. The consideration is that location of the drilling holes will take into considerations the environmental features.

## PART B

# ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

### 1) Draft environmental management programme.

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

Please refer to the Details of the EAP included in Part A, section 1(a).

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

The aspects of the activity are described in Part A

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)

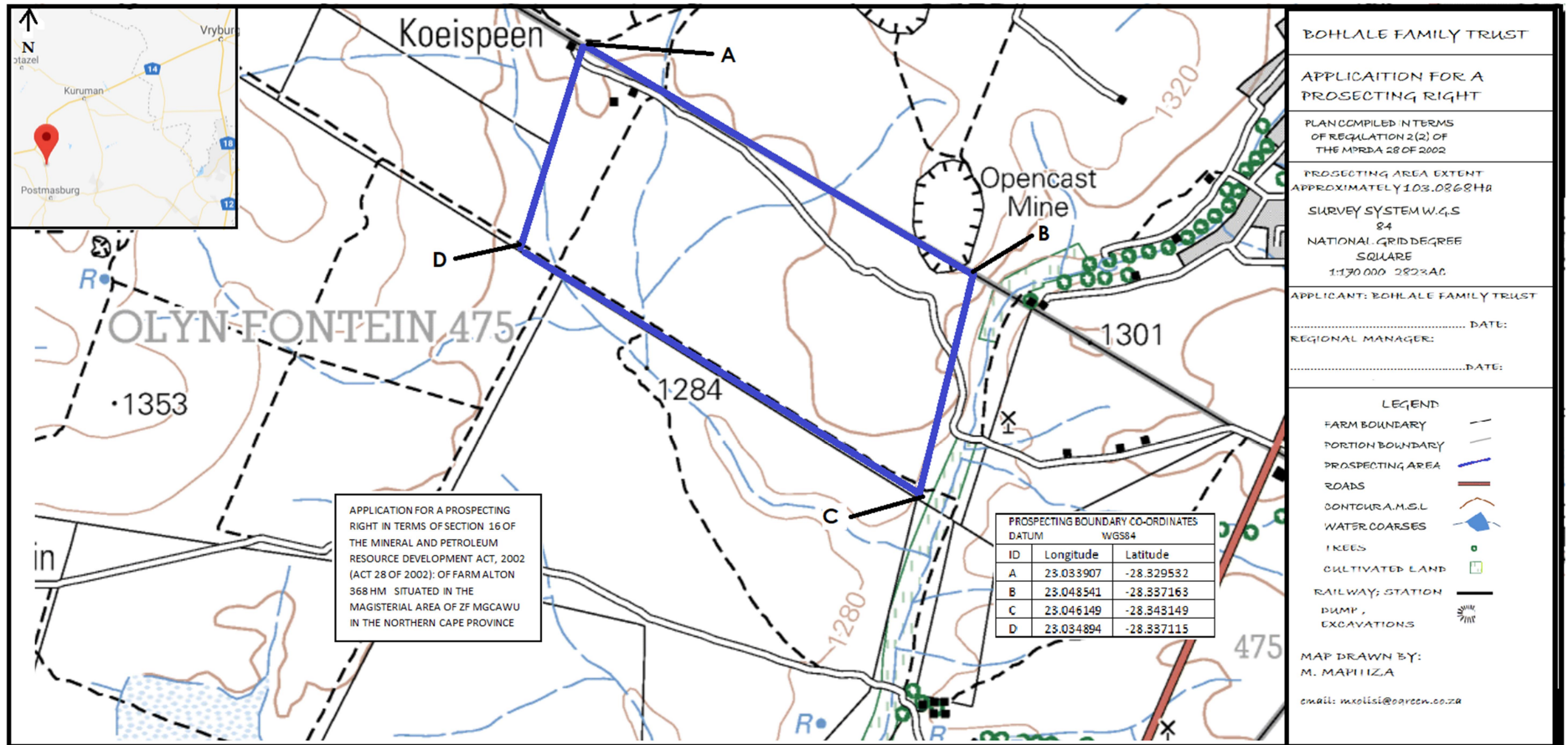


Figure 9: Regulation 2(2)

**d) Description of Impact management objectives including management statements**

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

The overall goal for closure of the prospecting site is to re-instate the predetermined land-use of the land owners, neighbours and community, ensuring that the land is stable and safe in the long-term. The closure objectives apply to the prospecting area in its final closed state and not whilst the site is in transformation towards this state. They nevertheless provide guidance during the operational phase. Closure objectives relate to the following:

**Physical stability:** To back-fill boreholes on the prospecting site to ensure continuation of the land use after completion of prospecting activities.

**Environmental quality:** To ensure that local environmental quality is not adversely affected by possible physical effects and chemical contaminants arising from the prospecting site after completion of prospecting activities.

**Health and safety:** To limit the possible health and safety threats to humans and animals using the rehabilitated prospecting area after completion of prospecting activities

**Land capability/land-use:** To ensure continuation or to re-instate a suitable land capability over as large as possible area affected during prospecting.

**Aesthetic quality:** To leave behind a rehabilitated prospecting site that is neat and tidy, giving an acceptable overall aesthetic appearance.

**Biodiversity:** To encourage the re-establishment of indigenous and/ or appropriate vegetation on the rehabilitated prospecting site such that the biodiversity is largely re-instated over time, as well as protect the undisturbed areas to maintain/enhance the biodiversity of these areas. Prospecting area rehabilitated to limit impact on current land use

**ii) Volumes and rate of water use required for the operation.**

Approximately 2000 litres of water will be required per day for the drilling activities

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

No Water use license is required for the prospecting application. Water will be sourced from commercial supplier and transported using water tankers

i) Impacts to be mitigated in their respective phases

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

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Phase 1: Non-invasive analysis	Planning	Site extent: 103.0868 ha	N/A	N/A	Before commencement of invasive prospecting activities
<b>Phase 2 and 3: Invasive Prospecting (5 drill holes spread over 2 phases)</b>					
Vegetation clearing	Pre-construction	0.05ha	<ul style="list-style-type: none"> <li>• The drill/site camp will be placed in a disturbed area that will limit impacts on vegetation.</li> <li>• No firewood harvesting will be allowed.</li> <li>• No fires will be made on site. Cooking will only be allowed on gas-stoves at designated areas.</li> <li>• No hunting will be allowed.</li> <li>• Should any protected tree or plant species be found on site, it will be avoided and a safe buffer (10-15 m) distance placed around it. If for any reason it cannot be avoided, the relevant permits will be applied for prior to removal.</li> </ul>	<ul style="list-style-type: none"> <li>• National Heritage Resources Act (No. 25 of 1999) (NHRA)</li> <li>• National Environmental Management: Biodiversity Act (Act No 10 of 2004) (NEMBA)</li> <li>• Noise; SANS 10103 and local municipal bylaws</li> <li>• Occupational Health and Safety Act (No. 85 of 1993) (OHSA)</li> <li>• National Water Act (No. 36 of 1998) (NWA)</li> </ul>	Throughout the course of the activity, but especially at the onset of the invasive phase of the prospecting

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Drill site operations	Operational	0.05 ha	<ul style="list-style-type: none"> <li>• All site personnel will have a basic level of environmental awareness training.</li> <li>• Topics covered should include;</li> <li>• What is meant by “Environment”</li> <li>• Why the environment needs to be protected and conserved</li> <li>• How construction activities can impact on the environment</li> <li>• What can be done to mitigate against such impacts</li> <li>• Awareness of emergency and spills response provisions</li> <li>• Social responsibility during construction of the camp site e.g. being considerate to local residents</li> <li>• The need for a “clean site” policy also needs to be explained to the workers.</li> <li>• Dust abatement by wetting down exposed areas at drill and/or camp sites will be required.</li> <li>• Vehicles will stay on the approved or available tracks as far as practically possible.</li> <li>• Low speed limits will be set to avoid the creation of dust (40 km/hr).</li> <li>• All the equipment and vehicles will be equipped with the manufactures stock standard exhaust systems which will minimise the amount of emissions from their engines.</li> <li>• No burning of waste will be allowed on site.</li> <li>• Fire extinguishers and other fire safety equipment will be available on site.</li> <li>• Drilling locations as set out by the final layout plan and as discussed with the relevant landowners will be adhered to.</li> <li>• A SACNASP Registered Wetland Specialist should be consulted when determining the final drill hole localities.</li> </ul>	<ul style="list-style-type: none"> <li>• NHRA</li> <li>• NEMBA</li> <li>• Noise; SANS 10103 and local municipal bylaws</li> <li>• OHSA</li> <li>• NWA</li> <li>• NEMWA</li> </ul>	Throughout the course of the activity, but especially at the onset of the invasive phase of the prospecting

			<ul style="list-style-type: none"> <li>• Should it be required that vegetation, outside of the disturbed agricultural land be removed, an appropriate specialist should be consulted prior to any disturbance of the vegetation.</li> <li>• Excavations and other clearing activities will only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.</li> <li>• Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Project Geologist and Drilling Contractor.</li> <li>• All areas will be rehabilitated immediately upon conclusion of work conducted.</li> <li>• The activities will comply with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996) and its regulations as well as other applicable legislations regarding noise control.</li> <li>• Employees will be supplied with ear plugs. All prospecting vehicles will be maintained in a road worthy condition.</li> <li>• All work will be limited to daylight hours, i.e. between 6am and 6pm</li> <li>• Bins will be emptied on a regular basis.</li> <li>• Domestic waste to be removed from site - no burying or burning of domestic waste will be allowed.</li> <li>• Ablution facilities will be regularly serviced.</li> <li>• Prospecting activities will not be conducted within 100 m of a watercourse or wetland. Should this become a requirement, the relevant permits will be obtained from DWS prior to drilling taking place. All preliminary drill hole locations are placed to NOT occur within these buffer zones.</li> <li>• Limited amounts of water (approximately 2000 litres / day) will be used during drilling. Water will be trucked to site.</li> </ul>		
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			<ul style="list-style-type: none"> <li>• Ablution facilities will not be placed within 32 m of any water body.</li> <li>• All storage tanks containing hazardous materials will be placed in bunded containment areas with sealed surfaces.</li> <li>• The bund wall must be high enough to contain 110% of the total volume of the stored hazardous material with an additional allocation for potential high runoff storm water events.</li> <li>• Any hazardous substances will be stored at least 100 m from any of the water bodies on site.</li> <li>• Contaminated wastewater will be managed by the Contractor to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp will be collected and removed from the site for appropriate disposal at a licensed commercial facility.</li> <li>• Stockpiles will be below the 1.5 m height restriction.</li> <li>• The use of oil drip trays under drilling equipment to ensure no spillage of oils and fuels onto the ground.</li> <li>• Where possible, no major vehicle repairs will be done on site.</li> <li>• Oils and fuel will be stored on bounded areas to avoid spillages.</li> <li>• Any spillages which may occur will be investigated and immediate action will be taken. In the event of significant spills (in excess of 35 litres) of any hazardous substance, this will be recorded and reported to the environmental personnel, Department of Water and Sanitation, DMR and any other relevant authorities. In such cases the contaminated soil will be excavated and disposed at a suitably licensed and registered landfill.</li> <li>• An emergency plan for spillages will be available on site.</li> <li>• Storm water runoff in and around drill holes will be</li> </ul>		
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			<p>controlled.</p> <ul style="list-style-type: none"> <li>• Keep equipment and vehicles within the limits of the initially disturbed areas.</li> <li>• Apply erosion control measures (i.e. silt fences) in areas that have high risk for erosion.</li> <li>• Only demarcated areas for drilling will be cleared to the minimum required for access and adjacent and/or other areas will not be disturbed.</li> <li>• No firewood harvesting will be allowed.</li> <li>• No fires will be made on site. Cooking will only be allowed on gas-stoves at designated areas.</li> <li>• No hunting will be allowed.</li> <li>• No cigarette butts will be disposed of on the relevant properties.</li> <li>• Should any protected tree or plant species be found on site, it will be avoided and a safe buffer (10-15 m) distance placed around it. If for any reason it cannot be avoided, the relevant permits will be applied for prior to removal.</li> <li>• Vehicles will remain on approved tracks.</li> <li>• Wind screening and storm water control will be undertaken to prevent soil loss from the site.</li> <li>• All erosion control mechanisms will be regularly maintained.</li> <li>• Re-vegetation of disturbed surfaces will occur immediately after the construction and prospecting activities are completed.</li> <li>• Rehabilitation will be undertaken progressively</li> <li>• Local museums as well as the South African Heritage Resource Agency (SAHRA) will be informed if any artefacts are uncovered in the affected area and mitigation measures recommended by SAHRA will be followed.</li> <li>• The contractor will ensure that his workforce is aware of the necessity of reporting any possible historical or</li> </ul>		
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			<p>archaeological finds to the ECO so that appropriate action can be taken.</p> <ul style="list-style-type: none"> <li>• Any discovered artefacts will not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted.</li> <li>• Drill sites are to be positioned to not impact on any identified sites heritage significance.</li> <li>• Warning signage will be erected at all intersections, including at the intersections with farm access roads.</li> <li>• Heavy vehicles will not travel the road between 10pm and 6am unless it is absolutely unavoidable and has been discussed with the relevant landowner.</li> <li>• Sufficient distance will be maintained between heavy vehicles to allow light vehicles to overtake safely.</li> <li>• All drivers will be made aware of the procedures to be followed if an accident occurs.</li> <li>• If any damage to gravel roads occur as result of drilling, the damage will either be compensated for or repaired.</li> </ul>		
Closure of boreholes and rehabilitation of sites	Decommissioning & Rehabilitation	0.05 ha	<ul style="list-style-type: none"> <li>• All waste bins and domestic waste will be removed from site once the activity is complete</li> <li>• Excess topsoil not used in rehabilitation will be levelled.</li> <li>• All equipment will be removed from site on completion of the activity.</li> <li>• All areas where temporary services were installed will be rehabilitated to the satisfaction of the ECO.</li> <li>• The site will be cleared of all litter.</li> <li>• Final inspection in order to ensure adherence to EMPr guidelines, completion of localised/ remaining areas of impact, monitoring of rehabilitation success, etc.</li> </ul> <p>Also refer to Rehabilitation in Part B of this report.</p>	<ul style="list-style-type: none"> <li>• Noise; SANS 10103 and local municipal bylaws</li> <li>• OHSA</li> <li>• NEMBA</li> </ul>	From the onset of the activity until the closure procedure has been completed and then, additionally, in the initial period after the activities are completed.

**e) Impact Management Outcomes**

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

<p><b>ACTIVITY</b> (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.).</p>	<p><b>POTENTIAL IMPACT</b>  (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)</p>	<p><b>ASPECTS AFFECTED</b></p>	<p><b>MITIGATION TYPE</b>  (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)  E.g.  <ul style="list-style-type: none"> <li>• Modify through alternative method.</li> <li>• Control through noise control</li> <li>• Control through management and monitoring</li> <li>• Remedy through rehabilitation..</li> </ul> </p>	<p><b>STANDARD TO BE ACHIEVED</b>  (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.</p>
<b>Constructive Phase</b>				
<p><b>Vegetation clearance</b></p>	<p><b>Fauna and Flora –</b> Clearance of vegetation for establishment of site camp</p>	<p>Vegetation</p>	<ul style="list-style-type: none"> <li>• The drill/site camp will be placed in a disturbed area that will limit impacts on vegetation.</li> <li>• No firewood harvesting will be allowed.</li> <li>• No fires will be made on site. Cooking will only be allowed on gas-stoves at designated areas.</li> <li>• No hunting will be allowed.</li> <li>• Should any protected tree or plant species be found on site, it will be avoided and a safe buffer (10-15 m) distance placed around it. If for any reason it cannot be avoided, the relevant permits will be applied for</li> </ul>	<p>Avoid limit vegetation removal to areas where construction will take place. Adhere to NEMBA.</p>

			<p>prior to removal.</p> <ul style="list-style-type: none"> <li>• A SACNASP Registered Wetland Specialist should be consulted when determining the final drill hole localities.</li> </ul>	
<b>ACTIVITY</b>	<b>POTENTIAL IMPACT</b>	<b>ASPECTS AFFECTED</b>	<b>MITIGATION TYPE</b>	<b>STANDARD TO BE ACHIEVED</b>
	<b>Air Quality</b> - dust creation due to clearance	Air quality	<ul style="list-style-type: none"> <li>• Dust abatement by wetting down exposed areas at drill and/or camp site, where required.</li> </ul>	Reduce impact of construction activities on air quality
<b>Operational Phase</b>				
<b>Drilling procedures</b>	<b>Air quality</b> – dust creation due to vehicle movement and drilling	Air quality	<ul style="list-style-type: none"> <li>• Dust abatement by wetting down exposed areas at drill and/or camp sites will be required.</li> <li>• Vehicles will stay on the approved or available tracks as far as practically possible.</li> <li>• Low speed limits will be set to avoid the creation of dust (40 km/hr).</li> <li>• All the equipment and vehicles will be equipped with the manufacturer's standard exhaust systems which will minimise the amount of emissions from their engines.</li> <li>• No burning of waste will be allowed on site.</li> <li>• Fire extinguishers and other fire safety equipment will be available on site.</li> <li>• Drilling locations as set out by the final layout plan and as discussed with the relevant landowners will be adhered to.</li> </ul>	Prevent air pollution by dust generation during operational phase.

			<ul style="list-style-type: none"> <li>• Excavations and other clearing activities will only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas.</li> <li>• Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Project Geologist and Drilling Contractor.</li> <li>• All areas will be rehabilitated immediately upon conclusion of work conducted.</li> </ul>	
	<b>Noise pollution</b> – vehicle movement, use of drill rigs and excavation machinery	Noise pollution	<ul style="list-style-type: none"> <li>• The activities will comply with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996) and its regulations as well as other applicable legislations regarding noise control.</li> <li>• Employees will be supplied with ear plugs. All prospecting vehicles will be maintained in a road worthy condition.</li> <li>• All work will be limited to daylight hours, i.e. between 6am and 6pm</li> </ul>	Reduce noise pollution. Adhere to relevant municipal by-laws.
	<b>Waste pollution</b> – domestic waste produced by workers	Waste pollution	<ul style="list-style-type: none"> <li>• Bins will be emptied on a regular basis.</li> <li>• Domestic waste to be removed from site - no burying or burning of domestic waste will be allowed.</li> <li>• Ablution facilities will be regularly serviced</li> </ul>	Eliminate littering and ensure that no waste remains on site once drilling is completed

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	<p><b>Water pollution</b> (Surface and groundwater, wetlands and water bodies) – due to possible spillages, leaks from vehicles or ablution facilities</p>	<p>Water pollution</p>	<ul style="list-style-type: none"> <li>• Prospecting activities will not be conducted within 100 m of a watercourse or wetland. Should this become a requirement, the relevant permits will be obtained from DWS prior to drilling taking place. All preliminary drill hole locations are placed to <b>NOT</b> occur within these buffer zones.</li> <li>• Limited amounts of water (approximately 2000 litres / day) will be used during drilling. Water will be trucked to site.</li> <li>• Ablution facilities will not be placed within 32 m of any water body.</li> <li>• No construction footprint will take place inside or within 100 meters of any water body or wetland.</li> </ul> <p><b>Hazardous materials</b></p> <ul style="list-style-type: none"> <li>• All storage tanks containing hazardous materials will be placed in bunded containment areas with sealed surfaces.</li> <li>• The bund wall must be high enough to contain 110% of the total volume of the stored hazardous material with an additional allocation for potential high runoff storm water events.</li> <li>• Any hazardous substances will be stored at least 100 m from any of the water bodies on site.</li> <li>• Contaminated wastewater will be</li> </ul>	<p>Avoid hydrocarbon spills and sewage spills.</p>

			<p>managed by the Contractor to ensure existing water resources on the site are not contaminated. All wastewater from general activities in the camp will be collected and removed from the site for appropriate disposal at a licensed commercial facility.</p>	
	<p><b>Soils</b> – soil erosion and pollution due to exposed areas not being managed, leaks or spillages from ablution facilities</p>	<p><b>Soils</b></p>	<ul style="list-style-type: none"> <li>• Dust abatement by wetting down exposed drill site and camp areas will be required.</li> <li>• Stockpiles will be below the 1.5 m height restriction.</li> <li>• The use of oil drip trays under drilling equipment to ensure no spillage of oils and fuels onto the ground.</li> <li>• Where possible, no major vehicle repairs will be done on site.</li> <li>• Oils and fuel will be stored on bounded areas to avoid spillages.</li> <li>• Any spillages which may occur will be investigated and immediate action will be taken. In the event of significant spills (in excess of 35 litres) of any hazardous substance, this will be recorded and reported to the environmental personnel, Department of Water and Sanitation, DMR and any other relevant authorities. In such cases the contaminated soil will be excavated and disposed at a suitably licensed and registered landfill.</li> <li>• An emergency plan for spillages will</li> </ul>	<p>Avoid erosion from occurring due to project activities</p>

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
			<p>be available on site.</p> <ul style="list-style-type: none"> <li>• Storm water runoff in and around drill holes will be controlled.</li> <li>• Keep equipment and vehicles within the limits of the initially disturbed areas.</li> <li>• Apply erosion control measures (i.e. silt fences) in areas that have high risk for erosion.</li> </ul>	
	<p><b>Fauna and Flora</b> – due to uncontrolled vehicle movement or improper rehabilitation</p>	<p><b>Fauna and Flora</b></p>	<ul style="list-style-type: none"> <li>• Only demarcated areas for drilling will be cleared to the minimum required for access and adjacent and/or other areas will not be disturbed.</li> <li>• No firewood harvesting will be allowed.</li> <li>• No fires will be made on site. Cooking will only be allowed on gas-stoves at designated areas.</li> <li>• No hunting will be allowed.</li> <li>• No cigarette butts will be disposed of on the relevant properties.</li> <li>• Should any protected tree or plant species be found on site, it will be avoided and a safe buffer (10-15 m) distance placed around it. If for any reason it cannot be avoided, the relevant permits will be applied for prior to removal.</li> <li>• Should it be required that vegetation, outside of the disturbed agricultural land be removed, an</li> </ul>	<p>Activities, human and vehicle movement to be restricted to existing roads and drill sites to be kept as small as feasible. Rehabilitation to be implemented as per the approved EMPr.</p>



			<p>appropriate specialist should be consulted prior to any disturbance of the vegetation.</p> <ul style="list-style-type: none"> <li>• A SACNASP Registered Wetland Specialist should be consulted when determining the final drill hole localities.</li> <li>• Prospecting activities will not be conducted within 100 m of a watercourse or wetland. Should this become a requirement, the relevant permits will be obtained from DWS prior to drilling taking place. All preliminary drill hole locations are placed to NOT occur within these buffer zones.</li> <li>• Vehicles will remain on approved tracks.</li> <li>• See rehabilitation mitigation measures.</li> </ul>	
	<b>Fire Prevention</b>	<b>Safety Fauna &amp; Flora</b>	<ul style="list-style-type: none"> <li>• The Drilling Contractor will have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.</li> <li>• See mitigation measures for Fauna and Flora above.</li> </ul>	Reduce the risk of fires occurring due to project activities.
	<b>Erosion</b>	Soils Fauna and Flora	<ul style="list-style-type: none"> <li>• Wind screening and storm water control will be undertaken to prevent soil loss from the site.</li> <li>• All erosion control mechanisms will be regularly maintained.</li> <li>• Re-vegetation of disturbed surfaces</li> </ul>	Reduce erosion due to project activities.

			will occur immediately after the construction and prospecting activities are completed. <ul style="list-style-type: none"> <li>• Rehabilitation will be undertaken progressively</li> </ul>	
<b>ACTIVITY</b>	<b>POTENTIAL IMPACT</b>	<b>ASPECTS AFFECTED</b>	<b>MITIGATION TYPE</b>	<b>STANDARD TO BE ACHIEVED</b>
<b>Closure Phase</b>				
<b>Closure of boreholes and rehabilitation of sites</b>	<b>Fauna and Flora</b> – due to uncontrolled vehicle movement or improper rehabilitation	Fauna and Flora	<ul style="list-style-type: none"> <li>• Mitigation measures as per Part B (EMPr) of this report will be adhered to.</li> <li>• Site activities will be restricted to daylight hours between 6am and 6pm and as per the agreement with the landowner/s.</li> <li>• Vehicles will remain on the existing tracks.</li> <li>• Prospecting activities will not be conducted within 100 m of pens and stalls.</li> <li>• All equipment will be removed from site.</li> <li>• Rehabilitation will be done in such a manner that the site is in the state prior to prospecting.</li> <li>• All structures comprising the drilling camp will be removed from site.</li> <li>• The area that housed the drilling camp will be checked for spills of substances such as oil, paint, etc., and these will be cleaned up and contaminants disposed of appropriately.</li> </ul>	Impacted areas to be rehabilitated to previous land use (agriculture).

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	<p><b>Land degradation</b> – due to improper site clean-up</p>	<p>Soils Visual</p>	<ul style="list-style-type: none"> <li>• All waste bins and domestic waste will be removed from site once the activity is complete.</li> <li>• Excess topsoil not used in rehabilitation will be levelled.</li> <li>• All equipment will be removed from site on completion of the activity.</li> <li>• All areas where temporary services were installed will be rehabilitated to the satisfaction of the ECO.</li> <li>• The site will be cleared of all litter.</li> <li>• Final inspection in order to ensure adherence to EMPr guidelines, completion of localised/ remaining areas of impact, monitoring of rehabilitation success, etc.</li> </ul>	<p>Impacted areas to be rehabilitated to previous land use (agriculture).</p>

### f) Impact Management Actions

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

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
<b>Vegetation clearance</b>	<b>Fauna and Flora</b> – Clearance of vegetation for establishment of site camp	<ul style="list-style-type: none"> <li>• Control through management and monitoring</li> <li>• Remedy thorough rehabilitation</li> </ul>	Throughout the course of the activity, but especially at the onset of the drilling phase	Adhere to Environmental Authorisation, Air Quality act and any available dust regulations relevant
	<b>Air Quality</b> - dust creation due to clearance			
<b>Drilling procedures</b>	<b>Air quality</b> – dust creation due to vehicle movement and drilling	<ul style="list-style-type: none"> <li>• Control through management and monitoring</li> <li>• Remedy thorough rehabilitation</li> </ul>	Throughout the course of the activity, but especially at the onset of the drilling phase.	Adhere to Prospecting works program, Environmental Authorisation for all aspects. In terms of dust adhere to Air Quality act and any available dust regulations relevant.
	<b>Noise pollution</b> – vehicle movement, use of drill rigs and excavation machinery	<ul style="list-style-type: none"> <li>• Control through management and monitoring</li> </ul>		In terms of Noise adhere to Noise Regulations (SANS 10103). Adhere to Prospecting works program, Environmental Authorisation for all aspects.
	<b>Waste pollution</b> – domestic waste produced by workers	<ul style="list-style-type: none"> <li>• Control through management and monitoring</li> <li>• Remedy thorough rehabilitation</li> </ul>		Adhere to Prospecting works program, Environmental Authorisation for all aspects.
	<b>Water pollution</b> (Surface and groundwater, wetlands and water bodies) – due to possible spillages, leaks from vehicles or ablution facilities	<ul style="list-style-type: none"> <li>• Control through management and monitoring</li> <li>• Remedy thorough rehabilitation</li> </ul>		In terms of other environmental features adhere to Biodiversity Act, Waste Act and Water Act. Adhere to Prospecting works program, Environmental Authorisation for all aspects.

<b>ACTIVITY</b>	<b>POTENTIAL IMPACT</b>	<b>MITIGATION TYPE</b>	<b>TIME PERIOD FOR IMPLEMENTATION</b>	<b>COMPLIANCE WITH STANDARDS</b>
<b>Drilling procedures</b>	<b>Soils</b> – soil erosion and pollution due to exposed areas not being managed, leaks or spillages from ablution facilities	<ul style="list-style-type: none"> <li>• Control through management and monitoring</li> <li>• Remedy thorough rehabilitation</li> </ul>	Throughout the course of the activity, but especially at the onset of the drilling phase.	In terms of other environmental features adhere to Biodiversity Act, Waste Act and Water Act. Adhere to Prospecting works program, Environmental Authorisation for all aspects.
	<b>Fauna and Flora</b> – due to uncontrolled vehicle movement or improper rehabilitation	<ul style="list-style-type: none"> <li>• Control through management and monitoring</li> <li>• Remedy thorough rehabilitation</li> </ul>		In terms of other environmental features adhere to Biodiversity Act, Waste Act and Water Act. Adhere to Prospecting works program, Environmental Authorisation for all aspects.
	<b>Fire Prevention</b>	<ul style="list-style-type: none"> <li>• Control through management and monitoring</li> </ul>		Adhere to Prospecting works program, Environmental Authorisation for all aspects.
	<b>Erosion</b>	<ul style="list-style-type: none"> <li>• Control through management and monitoring</li> <li>• Remedy thorough rehabilitation</li> </ul>		In terms of other environmental features adhere to Biodiversity Act, Waste Act and Water Act. Adhere to Prospecting works program, Environmental Authorisation for all aspects.
<b>Closure of boreholes and rehabilitation of sites</b>	<b>Fauna and Flora</b> – due to uncontrolled vehicle movement or improper rehabilitation	<ul style="list-style-type: none"> <li>• Control through management and monitoring</li> <li>• Remedy thorough rehabilitation</li> </ul>	From the onset of the activity until the closure procedure has been completed and then, additionally, in the initial period after the activities are completed.	Adhere to Prospecting works program, Environmental Authorisation for all aspects as well as Safety: MHSA guidelines.
	<b>Land degradation</b> – due to improper site clean-up	<ul style="list-style-type: none"> <li>• Control through management and monitoring</li> <li>• Remedy thorough rehabilitation</li> </ul>		Adhere to Prospecting works program, Environmental Authorisation for all aspects as well as Safety: MHSA guidelines.

**g) 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 provided below are to ensure that the closure of the site is compliant with the legislature and that the environment will be left in a state which is sustainable and not harmful. Closure objectives include but are not limited to:

- To ensure closure complies with the Mineral and Petroleum Resources Development Act 28 of 2002.
- To ensure that the prospecting footprints are rehabilitated to an acceptable standard, where there is ecosystem functioning and that all environmental and social risks have been reduced and do not pose any threat to the environment.
- To ensure that the goals which were specified in the rehabilitation section in this report have been met and that the land may have a sustainable use.
- To implement management strategies that will ensure that the negative impacts (risks) associated with proposed prospecting are eliminated or minimized to acceptable standards.
- To leave the area in a manner that is environmentally safe and does not pose any health risks to the neighbouring communities.

The objective of closure and rehabilitation for this area will be to leave the area in a functional state and returned to its pre-prospecting condition i.e. agricultural land.

The extent of the proposed site is approximately 103.0868 hectares. Based on the anticipated amount of drill holes (i.e. 4 phases over a 5 year period), site camp and storage area, the total disturbed extent equates to approximately 0.05% of the total area. Rehabilitation is a key mitigation action to reduce many of the impacts on the natural environment.

A rehabilitation programme has been prepared as part of the Draft EMPr in the relevant sections below. The objective of rehabilitation for this area will be to leave the area in a functional state and returned to its pre-prospecting condition i.e. agricultural land. Rehabilitation will be conducted in a progressive manner: All drill sites will be surveyed and backfilled on an ongoing basis as they are completed. The rehabilitation of drill sites would take the form of limited manual raking to open and flatten the surface area and very limited, targeted seeding of plants if the area is not in a disturbed area.

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

Yes the environmental objectives in relation to closure have been consulted with the land owners and the I & AP's

**(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 main purpose of rehabilitation is to minimize and remediate the negative impacts which were caused by prospecting. All efforts will be undertaken to rehabilitate the affected areas. This will mean that drill holes will be backfilled, areas where vegetation was removed will be re-vegetated, any piling of drill material will be removed from site, any stockpiled soil will be returned back to where it was excavated from and any fuel and oil leaks cleaned. All efforts will be made to rehabilitate the land to a quality of the same, if not better, than prior to the commencement of prospecting.

**Rehabilitation process**

Rehabilitation of impacted areas will involve the following process:

1. Removal of all construction equipment from the site.
2. Fill all drill holes with excavated soil.
3. Removal/spreading of all excess excavated soil.
4. Remove all construction rubble and rubbish.
5. Re-vegetation

- **Removal of all equipment from the site:** All construction equipment must be removed from the site. This includes vehicles, temporary structures, fencing, unused pipes/culverts etc.
- **Fill all drill holes with excavated soil:** Ensure that all drill sumps and holes are backfilled and all relevant anti-erosion mitigations are in place.
- **Removal/spreading of all excess excavated soil:** Any unused soil must be spread around the site and/or disposed of at a registered waste disposal facility.
- **Remove all construction rubble and rubbish:** All construction rubble and litter must be removed from the site and disposed of at a licenced waste disposal site.
- **Re-vegetation:** The re-vegetation process will not only focus on the rehabilitation of the drill holes but includes all exposed soil, transformed areas and areas where alien invasive plant species have been removed within the site caused as a result of the prospecting activities. Indigenous grass species, may be incorporated into these areas to create initial cover.

In order to rehabilitate impacted areas the following landscaping techniques will be employed:

- Mulch is to be harvested from areas that are to be denuded of vegetation during construction activities, provided that they are free of seed-bearing alien invasive plants;
- No harvesting of indigenous vegetation may be done outside the area to be disturbed by construction activities.
- The Contractor shall ensure that all weeds and alien/invasive species cleared for prospecting activities are removed from site.
- Alien vegetation must be removed within the demarcated development footprint.
- Soil stockpiles during the construction phase should be placed in such a manner that natural

drainage patterns are not disrupted (i.e. no stockpiles should be located in or adjacent to any seepage or drainage areas).

- No imported soil material should be used, unless it can be ensured that it is free of exotic and alien vegetation seeds;
- Where necessary, appropriate dust suppression techniques should be employed, such as regular watering of exposed areas and stockpiles;
- It is recommended that exposed areas of soil be stabilised as soon as possible, either through appropriate surfacing (e.g. roads) or through landscaping (e.g. road reserve, etc.);
- The natural topography of the site must be maintained during and after construction (i.e. indiscriminate levelling or elevating of the site must be avoided);
- In the case of existing surface wash-away and wind erosion, the Contractor shall implement remedial measures as soon as possible in order to prevent further erosion;
- Appropriate erosion control/ soil stabilisation measures are to be implemented where necessary;
- During construction the Contractor shall protect areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking other measures necessary to prevent the surface water from being concentrated in streams and from scouring the slopes, banks or other areas.
- Traffic and movement over stabilised areas is to be restricted and controlled, and damage to stabilised areas shall be repaired and maintained to the satisfaction of the ECO.

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

Rehabilitation measures have been designed to meet closure objectives as stipulated in various sections of the report.

The objectives of rehabilitation and closure are:

- To ensure that vegetation clearing is done in an appropriate manner.
- To leave the site in a safe state for humans and animals, as it was originally.
- To remove all equipment, excess topsoil and any waste generated.
- To backfill drill holes adequately.
- Ensure that the water resource and underground water is not affected by prospecting or rehabilitation activities.



### **Site camp establishment, access footpaths, roads and tracks**

- Ensure that the site camp is placed in an already disturbed area to limit vegetation disturbance.
- Ensure all equipment; fuel and waste have been removed from site.
- Place a natural barrier at the junction to the footpath/track/road being rehabilitated e.g. rocks to prevent further access.
- Loosen compacted soil on tracks when tracks are not needed again.
- Seeding to be done where required with appropriate seed.
- Daily site access will occur by the required vehicles.
- As far as possible, existing roads will be used. Consultation with the relevant landowner will be done where this is not possible.
- If any damage to gravel roads occur as result of drilling, the damage will either be compensated for or repaired.
- No new access roads will be constructed however should there be a need to establish access roads, these will be constructed in such a way that vegetation clearance is limited, and existing structures such as fence lines are followed as far as possible.
- No fences will be cut and all access gates will be left in their original state.

### **Drilling sites**

- Prior to drilling a photographic record of the site will be established.
- Drill sites will be selected based on geological information. These locations will be discussed with the relevant landowner.
- Drill sites will be marked with pegs that will be removed once the activity is complete.
- All drill sites will be screened for species of conservation concern.
- Vegetation removed must include the 1st upper 30 cm, where possible, of soil and stockpiled (topsoil).
- Topsoil and subsoil will be separated. Topsoil will be used in the rehabilitation phase.
- Since the plant material removed from the site are to be mixed into the topsoil to supplement the organic nutrient content of the soil, no further soil conditioning in terms of fertilising is deemed necessary.
- All cleared invasive alien vegetation will be removed from site.
- If drilling is required in grazing areas, consultations will be held with the relevant landowners to discuss consent and compensation.
- Backfilling will be done via raking of the suitable material over the disturbed areas.
- Drill holes will be plugged, capped and marked.

- All litter will be removed from site and the surrounds.
- Severely compacted soil will be loosened / scarified to allow water and seed penetration.
- Ablution facilities will be used and will be removed and the contents disposed of at an approved facility.
- Fires are prohibited on site.
- Where possible, no major servicing of vehicles will be allowed on site.
- Photographs of the site; file information with dates and notes when first monitoring is due as imperative.

### **Waste Disposal**

- All generated waste and litter will be removed from site on a weekly basis.
- Ablution facilities will be outsourced, maintained and serviced on a regular basis by a licenced service provider.
- All spills / leaks will be contained in an appropriate manner and removed from site to a licenced facility.

### **Rehabilitation**

- Prior to rehabilitation of the site, all remnants of foreign debris shall be removed from the site.
- All holes will be covered first with subsoil and then with topsoil (minimum of 10cm deep). Topsoil will be spread to the original depth (30cm where possible).
- As topsoil will contain all cleared vegetation, no additional treatment will be required.
- The soil must cover all the roots and be well firmed down to a level equal to that of the surrounding in situ material.
- Control weeds by means of extraction, cutting or other approved methods.
- Monitoring will be undertaken once a month or until rehabilitation has been deemed successful
- Follow up inspections will be conducted every two months to remove upcoming seedlings of alien vegetation.
- A single permanent marker will be required to mark the location of the drill hole for future reference. The siting of such a marker shall be cleared with the landowner.
- All rehabilitation referred to in this environmental management programme will be done concurrent to prospecting operations as set out in the MPRDA. Best practice methods will be used.
- Continuous monitoring of possible soil erosion will be required

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

Financial provision has been calculated according to the regulation 54 of the MPRDA and the principles presented in the guidelines for the determination of financial provision for the mining industry (2005) – and only aspects applicable to prospecting through exploration drilling up to de-establishment are addressed in the financial provision assessment

Please see calculated Quantum

**(f) Confirm that the financial provision will be provided as determined.**

Bohlale Family Trust herewith confirms both its capacity and willingness to make the financial provision required should the prospecting right be granted.

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

- a) Monitoring of Impact Management Actions
- b) Monitoring and reporting frequency
- c) Responsible persons
- d) Time period for implementing impact management actions

The following impacts will require monitoring:

- Air pollution
- Noise pollution
- Pollution of soil and erosion
- Water pollution and storm water runoff
- Condition of soils and vegetation due to removal or damage possible impacts on heritage resources

The monitoring and performance of the prospecting activities will be conducted as prescribed in terms of regulation 55 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002). Section 38 of the Act is also relevant as far as monitoring of impacts is concerned. This section stipulates that the holder of the prospecting right or permit is required to rehabilitate the land disturbed to its natural state or predetermined condition.

Quarterly EMP compliance audits by an ECO are required. These reports will inform the annual

performance assessment that will be submitted to DMR. It is important to note that all environmental damage in the prospecting area will be the responsibility of the permit/rights holder. The continuous monitoring of key environmental indicators throughout the life of the operation will ensure that impacts do not become unmanageable.

**Mechanism for monitoring compliance**

<b>SOURCE ACTIVITY</b>	<b>IMPACTS REQUIRING MONITORING PROGRAMMES</b>	<b>FUNCTIONAL REQUIREMENTS FOR MONITORING</b>	<b>ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)</b>	<b>MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS</b>
All Prospecting Activities	N/A	Ensure that the prospecting programme is being implemented in line with the approved prospecting works programme.	Geologist	Submit an annual prospecting progress report to DMR
	All commitments contained in the BA Report and accompanying EMPr	Ensure commitments made within the approved BAR and EMPr are being adhered to.	Internal environmental control officer and independent EAP	Undertake and submit an environmental performance audit every two years to DMR
Drilling activities	Noise	Weekly inspections will cover the following: <ul style="list-style-type: none"> <li>• Implementation of effective waste management</li> <li>• Establish and implement a stakeholder compliant register on site and ensure that all complaints are responded to promptly.</li> <li>• Ensure that an oil spill kit is readily available.</li> <li>• All storage tanks containing hazardous materials will be placed in bunded containment areas with sealed surfaces.</li> <li>• Rehabilitation of drill pads.</li> <li>• Records of water intersections on borehole logs.</li> <li>• Control and minimise the development of new access tracks.</li> <li>• Appropriate storage and handling of topsoil.</li> </ul>	Appointed drilling contractor	Weekly inspection and reporting
	Dust Fall			
	Visual			
	Soil & Vegetation			
	Social			
	Housekeeping & Maintenance			
	Waste management			
Rehabilitation				
Post drilling	<ul style="list-style-type: none"> <li>• Revegetation Stability</li> <li>• Soil erosion</li> <li>• Alien invasive species</li> </ul>	The Drill site shall be monitored biannually until closure certificate is obtained.	Environmental Coordinator	Biannual Monitoring Report

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

Annual performance assessment reports (including review of the financial provision) must be done by an independent ECO. These reports must be submitted to the DMR.

**j) Environmental Awareness Plan**

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

All employees will undergo an induction course when they are employed at the prospecting area which will inform them of the environmental issues / risks and requirements prior to work commencing. An annual refresher will be done thereafter. The following aspects of environmental training should be included within the induction course:

- Sustainability
- Environmental goals and manner of achieving these
- Rehabilitation
- Waste management / minimisation (including recycling)
- Saving water
- Dealing with soil contamination and spillages
- Solutions to environmental risks

The Site manager shall ensure that adequate environmental training takes place. All employees shall be given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in a language understandable by all employees. The environmental training should, as a minimum, include the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities
- The environmental benefits of improved personal performance;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities;
- The importance of not littering;
- The need to use water sparingly;
- Details of, and encouragement to, minimise the production of waste and re-use, recover and recycle waste where possible;
- Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered;
- Details regarding flora of special concern, including protected/ endangered plant and species, and the procedures to be followed should these be encountered during the construction phase.

- In the case of permanent staff, the Site manager shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the Site manager shall inform how he intends concluding his environmental training obligations.

Environment and health awareness training programmes should be targeted at three distinct levels of employment, i.e. the executive, middle management and labour. Environmental awareness training programmes should contain the following information:

- The names, positions and responsibilities of personnel to be trained.
- The framework for appropriate training plans.
- The summarised content of each training course. The ECO shall monitor the records as listed above

## **2. Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.**

All employees must be provided with environmental awareness training to inform them of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. This should be in conjunction with the implementation of the EMPr

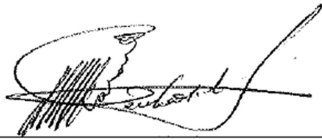
### **k) Specific information required by the Competent Authority (Among others, confirm that the financial provision will be reviewed annually).**

- Prospecting Work Programme
- The Financial Provision reviewed on an annual basis
- Performance assessment
- External Audits

**j) UNDERTAKING**

The EAP herewith confirms

- a. the correctness of the information provided in the reports ✓
- b. the inclusion of comments and inputs from stakeholders and I&APs ; ✓
- c. the inclusion of inputs and recommendations from the specialist reports where relevant; ✓ and
- d. that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein. ✓



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Signature of the environmental assessment practitioner:

MMRW Environ. Consulting and Training

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Name of company:

04/12/2019

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Date:

**-END-**