



**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: NW30/5/1/1/2/11799PR**

## 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—
    - a. can be reversed;
    - b. may cause irreplaceable loss of resources; and
    - c. 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

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## 1 DETAILS OF EAP

### 3. Contact Person and correspondence address

#### a) Details of

##### i) Details of the EAP

Name of the Practitioner: San Oosthuizen

Tel No.: 011 431 2251

Fax No.: 086 539 6127

e-mail address: san@ecopartners.co.za

##### ii) Expertise of the EAP.

###### (1) The qualifications of the EAP

(with evidence). MSc Zoology

Member: International Association For Impact Assessment

Environmental Assessment Practitioners Association of South Africa

###### Summary of the EAP's past experience.

(In carrying out the Environmental Impact Assessment Procedure)

Extensive working knowledge and understanding of environmental policies, principles and legal and other requirements as applicable to South Africa.

More than 15 years experience in the compilation of Environmental Impacts Assessment Reports and Mine Environmental Management Plans (EMPs)

Please refer Appendix 1 for CV.

## 2 LOCATION OF ACTIVITY

### b) Location of the overall Activity.

|   |   |
|---|---|
| <b>Farm Name:</b>   | Tweelaagte 175 JP   |
| <b>Application area (Ha)</b>                                | 1069 Ha   |
| <b>Magisterial district:</b>                                | Moses Kotane Magisterial District   |
| <b>Distance and direction from nearest town</b>             | Tweelaagte is located 57km northwest of Rustenburg. The farm is located approximately 4km west of the Pilanesberg National Park and 20km north-west of the Sun City Resort. |
| <b>21 Digit Surveyor General Code for each farm portion</b> | <u>Code</u> <u>Parcel Number</u>  |

|  |                       |       |         |
|--|-----------------------|-------|---------|
|  | BOJP00000000017500001 | 1/175 | RE of 1 |
|  | BOJP00000000017500005 | 5/175 |         |
|  | BOJP00000000017500007 | 7/175 |         |
|  | BOJP00000000017500008 | 8/175 |         |
|  | BOJP00000000017500009 | 9/175 |         |

### c) Locality map

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

Tweelaagte 175 JP is located 57km northwest of Rustenburg. The farm is located approximately 4km west of the Pilanesberg National Park and 20km north-west of the Sun City Resort.

The rural settlements of Witrandjie and Phalane are located on the eastern and western ends of the property respectively. Tlhatlaganyane, Mabeskraal and Bapong are all within a 7km radius of the property.

**Figure 1: Location Map**



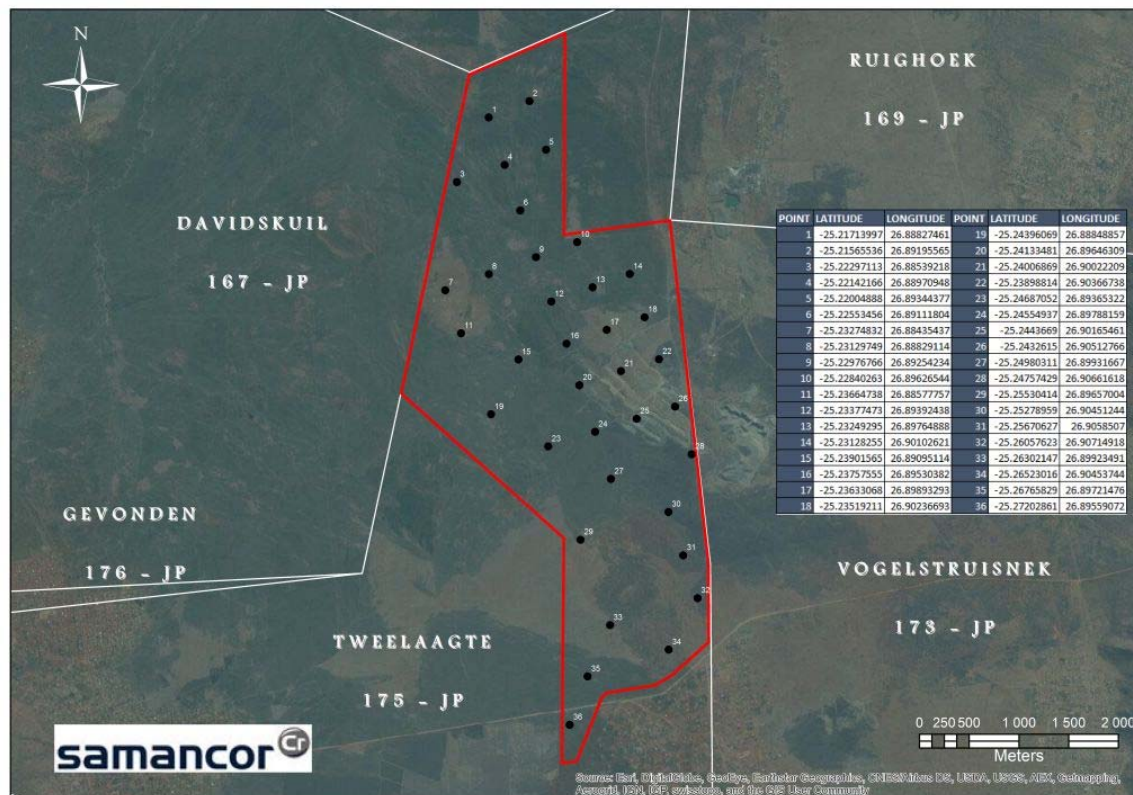
Please also refer to the **Locality Map** Appendix 2

**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

The prospecting plan consists of 42 boreholes and 6 test pits. No infrastructure will be constructed. Use will be made of existing roads where possible. A preliminary drill grid is provided below to indicate approximate location of activities on the site. A buffer of 100 meters will be kept between boreholes, test pits and existing houses.

**Figure 2: Preliminary Drill Grid showing location of drill holes and test pits**



Source: Samancor

Please also refer to the drill grid in **Appendix 3**.

### 3 DESCRIPTION OF ACTIVITY

#### (i) Listed and specified activities

| NAME OF ACTIVITY<br><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><br>E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc. etc. etc.) | Aerial extent of the Activity Ha or m <sup>2</sup> | LISTED ACTIVITY<br>Mark with an X where applicable or affected. | APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985) |
|--|--|---|---|
| Prospecting for Chrome (Cr) (Middle Group and Lower Group seams), by means of diamond drilling of 42 boreholes.<br>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. The holes will be drilled to depth varying between 35m - 150m.<br>Pitting (6 pits) will be necessary in the outcropping areas.  | 1069 Ha<br>(Disturbed area - 0.47 Ha)              | X   | GNR 983<br>Listing Notice 1<br>Activity 20              |
| Vegetation clearance for Drill Site  | 0.47 Ha  | X   | GNR 985<br>Listing Notice 3<br>Activity 12(a)(ii)       |

#### (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)

The prospecting of the area will occur over a five year period divided into four phases. The first phase will consist primarily of non-invasive methods, whilst the second and part of the third phase will use some invasive techniques. The third phase will conclude with resource modeling and a pre-feasibility study. The fourth phase will entail invasive and non-invasive phases.

During the first phase of non-invasive prospecting there will be no disturbance of the ground, the landowners will be engaged as to where the invasive prospecting could take place with minimal impact on their activities or livelihood.

For the full prospecting period a maximum of 42 holes will be drilled to a depth varying between 30-150m and additional pitting will be done to a depth of about 2m. Pitting will be restricted to six small areas. Drilling will take place one hole at a time. The drill site will be cleared of obstructions and debris and then drilled. Rehabilitation will occur concurrently with drilling.



Drilling will be conducted using a diamond drill rig (refer **Figure 1**). 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 rarely exceeds 100m<sup>2</sup> or 0.01 ha per hole. For the drilling of the envisaged 42 holes the areas to be affected will be approximately 0.42 ha. Fencing will be temporary.

**Figure 3: Example of a Typical Drill Rig**



### **3.1 PHASE 1 (5 MONTHS) NON-INVASIVE**

#### ***Phase 1(a): Literature Study:***

The first phase of prospecting will commence with a literature study, on the geological, geographical, environmental and geomorphological including the topographical and infrastructural systems of the area. Existing literature, maps and previous exploration data of the area will be consulted.

#### ***Phase 1(b): Field Mapping:***

This stage will include the field traverse (walk-down) of the farm collecting geological information; the information will be correlated with the literature study information in order to correlate with the correct stratigraphy and lithological units.

#### ***Phase 1(c): Geophysical Survey:***

Samancor Chrome will either buy data of previous studies done or conduct airborne geophysics over the property.

### ***Phase 1(d): Data Interpretation and Decision Making***

In this sub-phase all the data acquired will be analysed and a decision to conduct further studies will be taken.

### **3.2 PHASE 2: (14 MONTHS) RECONNAISSANCE DRILLING**

This phase will entail the reconnaissance drilling of the orebody. 10 holes are planned in this phase to a depth between 30-150m depending on the orebody orientation. The core from the drill holes will be logged and sampled. The results of this phase will decide if the next phase will be carried out.

### **3.3 PHASE 3: (26 MONTHS) RESOURCE DRILLING**

In this phase of drilling 12 holes are planned to a depth between 30-150m depending on the orebody orientation. The core from the drill holes will be logged and sampled. Six test pits will be made by means of a mechanical shovel. The location of the test pits will depend on the geological formation. The results of this phase will decide if the next phase will be carried out. The results from this phase helps model the ore-body and feed into a pre-feasibility study. .

### **3.4 PHASE 4: FEASIBILITY DRILLING AND FEASIBILITY STUDIES (14 MONTHS)**

In this phase of drilling 20 holes are planned to a depth between 30-150m depending on the orebody. Pitting will be necessary in the outcropping areas and their locations will be determined by the availability of outcropping areas and the depth of the target seams.

The orebody will then be modeled with better accuracy. A feasibility study will then be conducted and the reserves of the deposit calculated and a decision to apply for a mining right will then be taken.

The equipment to be used is as follows:

- Drill Equipment
- Temporary Fencing
- Wooden pegs
- Safety Cones
- Field vehicles
- Spades
- First aid kit
- Sample bags
- PPE (dust mask; gloves; goggles reflector vest)

No staff will be living on the proposed site. There will be portable toilets located on site to provide sanitary facilities to the employees. The described prospecting activities will trigger one listed activity under the National Environmental Management Act, Act 107 of 1998.

## 4 LEGAL FRAMEWORK

### e) Policy and Legislative Context

| <b>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</b><br>(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) | <b>REFERENCE WHERE APPLIED</b> | <b>HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.</b><br>(E.g. In terms of the National Water Act a Water Use License has/ has not been applied for) |
|---|--------------------------------|--|
| National Environmental Management Act, Act 107 of 1998  |                                | In terms of NEMA Section 24 an Environmental authorisation application has been applied for  |
| Mineral and Petroleum Resources Development Act, Act 28 of 2002   |                                | In terms of MPRDA Section 16 an Environmental Authorisation for prospecting has been applied for   |
| NW Biodiversity Conservation Assessment   |                                | In terms of NEMA Section 24 an Environmental authorisation application has been applied for (Listing Notice 3)   |

## 5 NEED AND DESIRABILITY

### f) Need and desirability of the proposed activities.

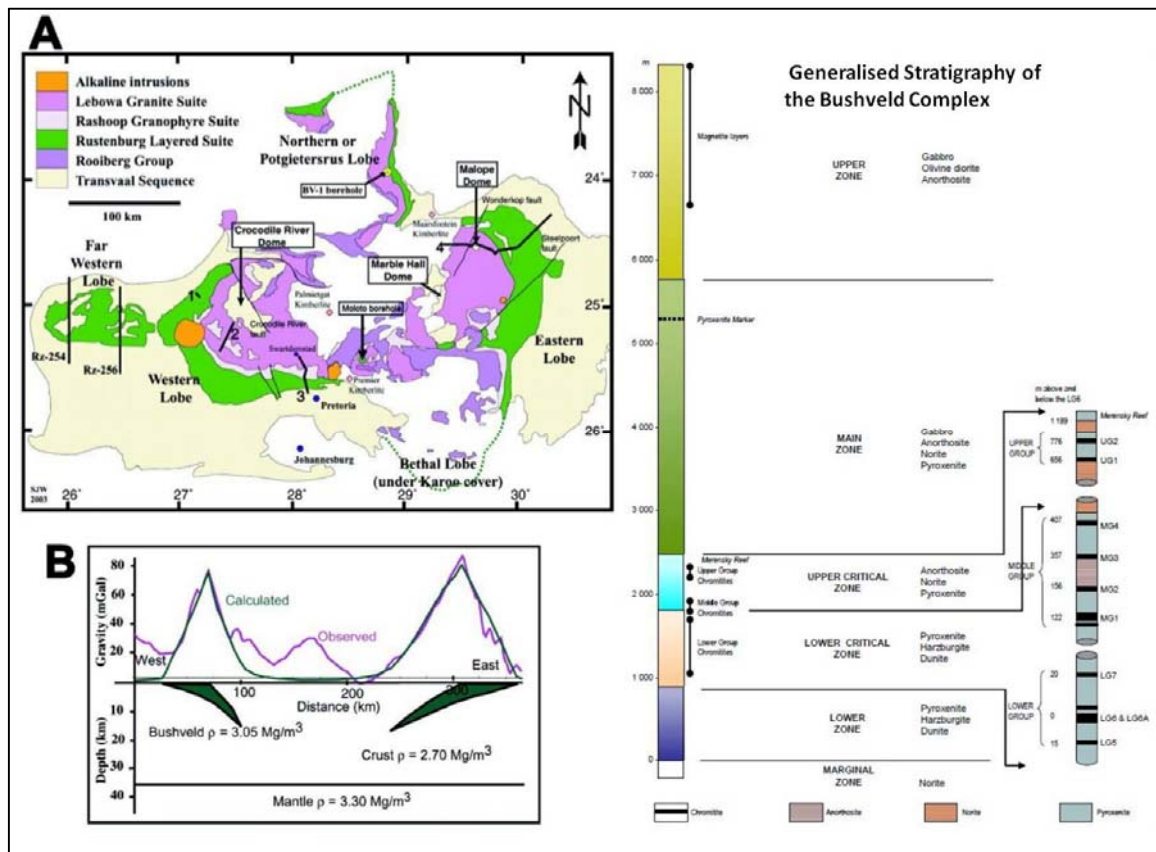
(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

The chromitite resources in South Africa are situated within the Bushveld Complex ("BC"), which is an enormous saucer-like ultramafic/mafic intrusion extending for about 400km east to west and roughly the same distance north and south.

The ultramafic/mafic rocks of the BC are collectively known as the Rustenburg Layered Suite ("RLS") and have been subdivided, from base to top, into five zones, known as the Marginal, Lower, Critical, Main and Upper Zones. The general sequence and composition of the different zones is shown in Figure 4. The continuity of the Critical Zone is intermediate between that of the Lower Zone and Main Upper Zones. The Critical Zone is the host to the chromium and Platinum Group Metals ("PGM") mineralisation within the BC in our area of interest. The Critical Zone spans the areas shown in Figure 4.



Figure 4: General Geology & Stratigraphy of the Bushveld Complex



Tweelagte 175 JP falls within the Critical Zone as seen in Figure 5. Desktop studies and high level geological mapping indicate the occurrence of the chromitite seams of the lower groups (“LGs”) and middle groups (“MGs”). The igneous layering within the Critical Zone is remarkably uniform over much of the BC, with individual layers traceable for tens to hundreds of kilometres. It may be subdivided into lower and upper sections and is made up of cyclic units consisting of chromitite, pyroxenite, norite and anorthosite. Cycles in the Lower Critical Zone are entirely ultramafic in character. Cycles in the Upper Critical Zone comprise ultramafic lithologies and also norite-anorthosite.

Chromitite layers occur throughout the Critical Zone, usually, but not always, at the base of crystallisation cycles. The chromitite seams have been classified into lower, middle and upper groups, with the Lower Group occurring in the Lower Critical Zone and the Upper Group in the Upper Critical Zone. The Middle Group chromitite seams straddle the boundary between lower and upper divisions of the Critical Zone.

The chromitite seams are named according to their location within the layered succession, with numbers commencing from the bottom up, with the lowermost group being named LG1, followed by LG2, LG3, etc. in the Lower Group (consisting of 7 layers), progressing to MG0, MG1, MG2, etc. in the Middle Group (consisting of 4 layers), and then two layers in the Upper Group, UG1 and UG2. The

thickness of these chromitite layers ranges from several millimetres to several metres and named chromitite layers may comprise multiple, composite layers of chromitite separated by interlaminated silicate rocks. The thickest chromitite layers, specifically the LG6 and MG1, are mined for their chromite content.

The target area of this application is underlain by rocks of the Critical Zone of the BC, consisting of chromitite interlayered with pyroxenite, norite, anorthositic norite, and mottled anorthosite.

Chromite is important because it is the only economic ore of chromium, an essential element for a wide variety of metal, chemical and manufactured products. Many other minerals contain chromium, but none of them are found in deposits that can be economically mined to produce chromium ([www.Geology.com](http://www.Geology.com)).

Chromium is a metal used to induce hardness, toughness and chemical resistance in steel. The alloy produced is known as "stainless steel." When alloyed with iron and nickel, it produces an alloy known as "nichrome" which is resistant to high temperatures and used to make heating units, ovens and other appliances. Thin coatings of chromium alloys are used as plating on auto parts, appliances and other products. These are given the name "chrome plated." It is also used to make superalloys that can perform well in the hot, corrosive, and high-stress environment of jet engines ([www.Geology.com](http://www.Geology.com)).

## **6 ALTERNATIVES**

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

**Location Alternatives:** This property provides the ideal geological formation for the presence of chromite minerals. It is situated between known chromite occurrences and has the existing infrastructure in the area which can support its development. Properties further west could have uneconomic chrome and other low value commodities such as andalusite. These properties are not a reasonable alternative. Moving to the east, one is heading closer towards the Pilanesberg National Park. This is not considered a reasonable location alternative. The proposed prospecting area was first thought to be a larger portion of the farm, however there are existing chrome mineral right applications on these portions and the area for this application had to be reduced.

**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. Another alternative is to use mechanical shovels to pit the outcrops as opposed to developing large trenches across the property. This reduces the surface footprint of the activities.

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

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

### **i) Details of the development footprint alternatives considered.**

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

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

## **6.1 PROPERTY**

This property provides the ideal geological formation for the presence of chromitite minerals. Tweelaagte 175 JP falls within the Critical Zone as seen in Figure 5.

## **6.2 TYPE OF ACTIVITY**

A total of 42 holes are proposed for the site. It will be possible to drill 40m per day. The drilling team will not stay onsite and depending on the geological formation it will take approximately 1 - 3 days to drill one borehole.

All holes will be drilled by means of a diamond drill rig. The drilled holes will be co-ordinated by GPS and logged onto a modelling system. It will be mapped onto an ortho-photo (1:10 000) scale. The holes to a maximum depth of 35 - 150 m and broadness may vary between 60mm - 75.7 mm. This will allow establishment of the thickness of the overburden. A maximum of 42 holes could be drilled for the proposed site.

Holes will not be drilled closer than 60m from any water source and also not closer than 50m from the small hill.

Overburden will be recorded and the holes filled back simultaneously. The approximate time or drilling each hole is 1 to 3 days, depending on depth of drill hole.

Drilling will take place one hole at a time. The drill site will be cleared of obstructions and debris and then drilled. Rehabilitation will occur concurrently with drilling.

### **6.3 DESIGN & LAYOUT**

This is an application for prospecting of chromitite mineral. No infrastructure will be developed on site. Activities will be limited to the drilling of 42 boreholes and 6 test pits to be determined by the geological formations found during prospecting. The major design alternative is to operate with one drill rig. It does make the process slightly longer but the speed of rehabilitation can be closely controlled and supervision can be better focussed. No changes to the layout is considered but with the geophysical survey information the holes can be orientated to match the shape of the orebody.

### **6.4 TECHNOLOGY**

The biggest technology intervention is the use of geophysical surveys which makes the requirement for less holes apparent. Geophysical surveys also provide an added advantage of being done quickly and so execution can commence early. The safety factor of utilising geophysical surveys is also apparent as there is less time to keep people exposed to moving machinery.

### **6.5 No -Go OPTION**

The existing agricultural activities will continue.

If prospecting is not approved the presence of chromitite minerals will not be assessed. The feasibility for mining at the proposed site will not be established. The ore which is important to the on-going industrialisation of the South African economy may not be identified, recovered, processed and deployed to grow the economy.

## **7 PUBLIC PARTICIPATION PROCESS**

### **ii) Details of the Public Participation Process Followed**

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

The Public Participation Process mainly comprises the engagement with Interested and Affected Parties (I&APs) and is of utmost importance in any assessment process. The PPP, inter alia, involves the following:

- a. Inform, raise awareness and increase understanding of environmental issues or any other issues that might be affected by the mining process.
- b. Establish lines of communication between stakeholders, I&APs and the project team.
- c. Provide opportunity to all parties for the exchange of information and expression of views and concerns.
- d. Obtain contributions of stakeholders and I&AP and ensure that all views, issues, concerns and queries are documented.

- e. Identify the significant issues associated with the proposed project.

EcoPartners (Pty) Ltd was appointed by Samancor Chrome Limited as the consultant to handle the prospecting right application, including PPP. As stipulated in Section 16 (4) (b) of the MPRDA (Act 28 of 2002), I&APs need to be notified and consulted with, as part of a prospecting right application (PRA). Regulation 41 of the 2014 EIA Regulations (GN 982 of 4 December 2014) stipulates the process to be followed for public participation.

## **7.1 IDENTIFICATION OF I&APs**

The first phase of the PPPs to identify all I&APs.

The landowners and the neighbours were identified using Windeed, this system allows EcoPartners to identify last registered postal address of the farm owners and where available their contact numbers as well. This is the contact information used for the notification.

Other I&APs, that were notified is the, local municipality Moses Kotane Local Municipality well as the State Departments and/or Organs of State which have jurisdiction in the area they are:

- Madibeng Local Municipality
- Moses Kotane Local Municipality
- Ward Councillors for Ward 24, 26 and 27
- Department of Water Affairs
- Department of Environmental Affairs
- Department of Land Affairs
- SANRAL
- ESKOM
- SAHRA

*It is important to note that the identification and notification of potential stakeholders will be an ongoing process throughout the PPP, as more information is gathered and contact with people is established.*

## **7.2 NOTIFICATION OF I&AP**

I&APs were notified using various methods, each of these are described below:

- Initial Project Notification
- Project Meeting
- Notification of Reports

## **Initial Project Notification**

### *Notification Letters via mail*

All identified Interested and Affected Parties were supplied with a notification letter, informing them about the application that has been submitted by Samancor Chrome, which is accompanied by a Background Information Document (BID). The notification letter also had a registration form and a questionnaire attached to it to get the input from the I&AP as well as gather crucial information. These letters were sent via registered mail with the South African Post Office or sent by email.

### *Newspaper Advert*

A newspaper notice was placed in a newspaper that circulates in the local municipality, for this project it was the Rustenburg Herald. This notice serves to notify all those who have an interest in the project and also for those whose contact details could not be obtained. The newspaper notice contained the details of the project as well as details of where additional information can be found. This newspaper notice was published on 13 November 2015.

### *Site Notices*

A2 site notices were also put up in the area. Two A2 notices and four A3 notices were put up on and around the property. The table and figure below indicate where the A2 notices were fixed.

**Table 1: Location of A2 Site Notices**

| Site Notice | Latitude      | Longitude     |
|-------------|---------------|---------------|
| 1           | 25°15'55.72"S | 26°54'29.26"E |
| 2           | 25°13'35.78"S | 26°54'12.68"E |

**Figure 5: Map indicating location of A2 Site Notices**



#### *Hand Delivery of Notification*

On the day that the site notices were put up, notification letters was handed out to people in the area.

### **7.3 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.

### **7.4 NOTIFICATION OF REPORTS**

#### *Draft BAR*

The draft BAR will be sent off to the CA, in this case the DMR for comments. Thereafter it will be loaded onto the EcoPartners Website for all registered I&APs to access. Registered I&APs will be sent

a notification to their email addresses or an SMS to inform them that the draft BAR is available for comment. I&APs will be advised on how to access the document from the website.

#### *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.

**This section to be completed once the PPP process has been conducted**

DRAFT



ii) **Summary of issues raised by I&APs**

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

**This section to be completed once the PPP process has been conducted**

| Interested and Affected Parties   |  | Date Comments Received | Issues Raised | EAPs response to issues as mandated by the applicant | Section and paragraph reference in this report where the issues and or response were incorporated |
|---|--|------------------------|---------------|--|---|
| List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted |  |                        |               |  |   |
| <b>AFFECTED PARTIES</b>   |  |                        |               |  |   |
| <b>Landowners/s</b>   |  |                        |               |  |   |
|   |  |                        |               |  |   |
|   |  |                        |               |  |   |
|   |  |                        |               |  |   |
| <b>Lawful occupier/s of the land</b>  |  |                        |               |  |   |
|   |  |                        |               |  |   |
|   |  |                        |               |  |   |
| <b>Landowners and lawful occupiers on adjacent properties</b>   |  |                        |               |  |   |
|   |  |                        |               |  |   |
|   |  |                        |               |  |   |
|   |  |                        |               |  |   |
| <b>Municipal councillor</b>   |  |                        |               |  |   |
|   |  |                        |               |  |   |
|   |  |                        |               |  |   |
| <b>Municipality</b>   |  |                        |               |  |   |
|   |  |                        |               |  |   |
|   |  |                        |               |  |   |
| <b>Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA</b>                |  |                        |               |  |   |

| Interested and Affected Parties<br>List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted |  | Date Comments Received | Issues Raised | EAPs response to issues as mandated by the applicant | Section and paragraph reference in this report where the issues and or response were incorporated |
|--|--|------------------------|---------------|--|---|
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |
| <b>Communities</b>   |  |                        |               |  |   |
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |
| <b>Dept. Land Affairs (Land Claims Commission)</b>   |  |                        |               |  |   |
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |
| <b>Traditional Leaders</b>   |  |                        |               |  |   |
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |
| <b>Dept. Environmental Affairs</b>   |  |                        |               |  |   |
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |
| <b>Other Competent Authorities affected</b>  |  |                        |               |  |   |
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |
| <b>OTHER AFFECTED PARTIES</b>  |  |                        |               |  |   |
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |
| <b>INTERESTED PARTIES</b>  |  |                        |               |  |   |
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |
|  |  |                        |               |  |   |

## 8 DESCRIPTION OF THE ENVIRONMENT

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

### (1) Baseline Environment

**(a) Type of environment affected by the proposed activity.** (its current geographical, physical, biological, socio-economic, and cultural character).

#### 8.1 GEOGRAPHICAL CHARACTER

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

##### *Regional Geology*

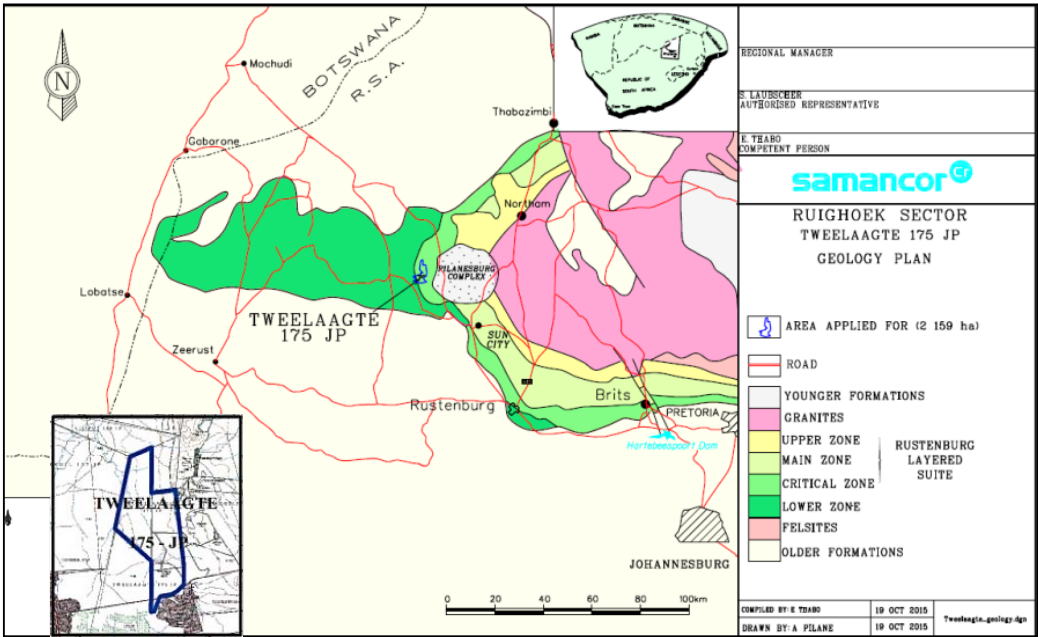
The proposed prospecting area is situated on the Bushveld Igneous Complex (BIC) – a massive layered, igneous intrusion the largest known layered intrusion that extends a distance of 500km from the border of Botswana in the west to Burgersfort in the east. The BIC has a thickness of between 7 – 9 km of magmatic rock exposed in five lobes or limbs. The economically important basal mafic to ultramafic suite, known as the Rustenburg Layered Suite (RLS). It is divided into five zones.

##### *Inferred Project Geology*

The proposed prospecting area consists of the Lower and Upper Critical Zone that have a general north-south strike and a gentle eastward dip. The Middle Group (MG) chromitite package comprising the MG 4A, 3 and 1; and the Lower Group package comprising the LG1 – 7 could be present on the property.

The geographical character of the area is therefore the buried ore-body covered with sediments derived from the surrounding igneous rocks of the area. In this area it has resulted in a very gently sloping property with minor undulations. No river traverses the property. The soil profile therefore fluctuates from very thin to the areas where it is thick because of undulations in the bedrock.

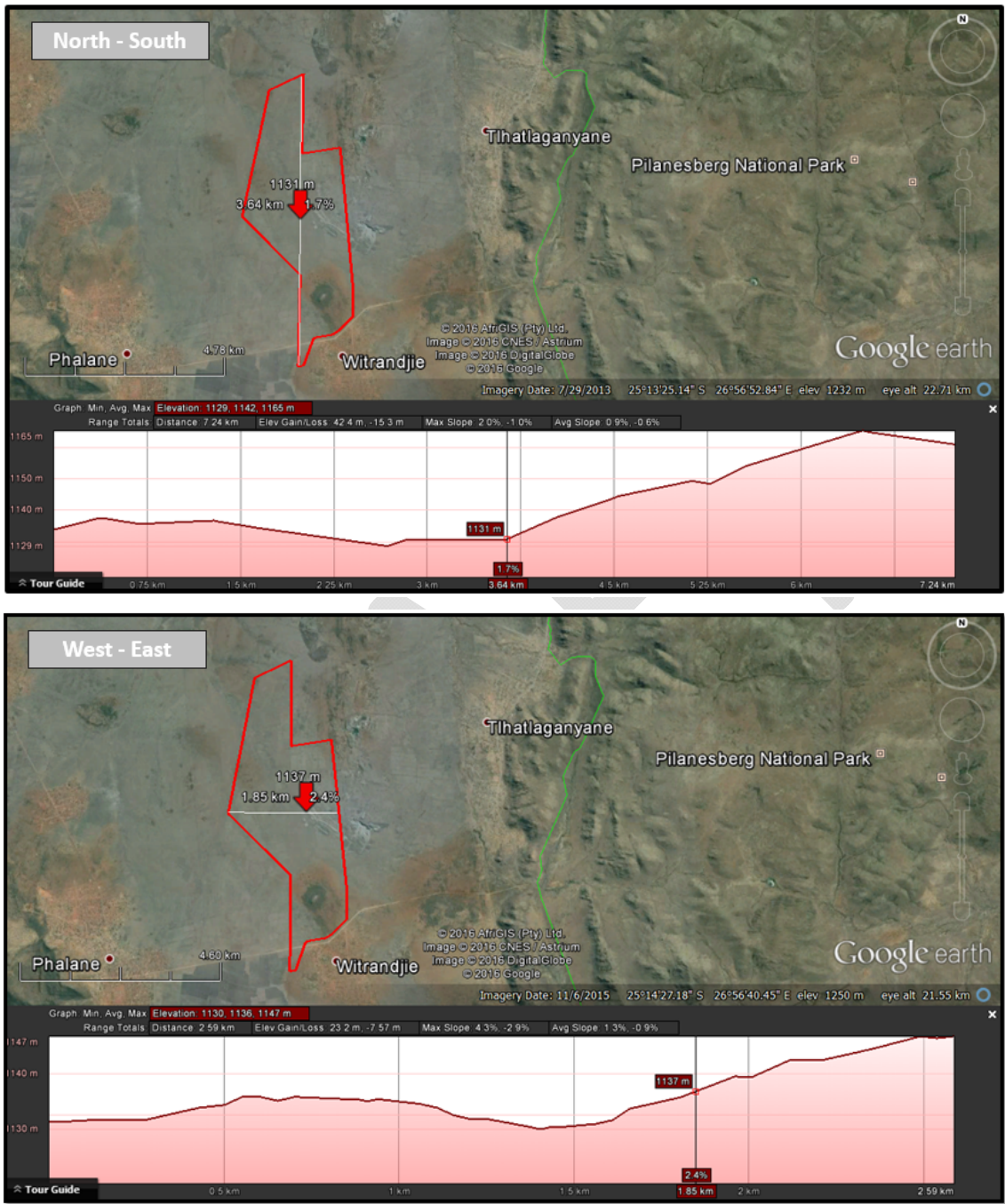
Figure 6: Geology Map



## 8.2 TOPOGRAPHY

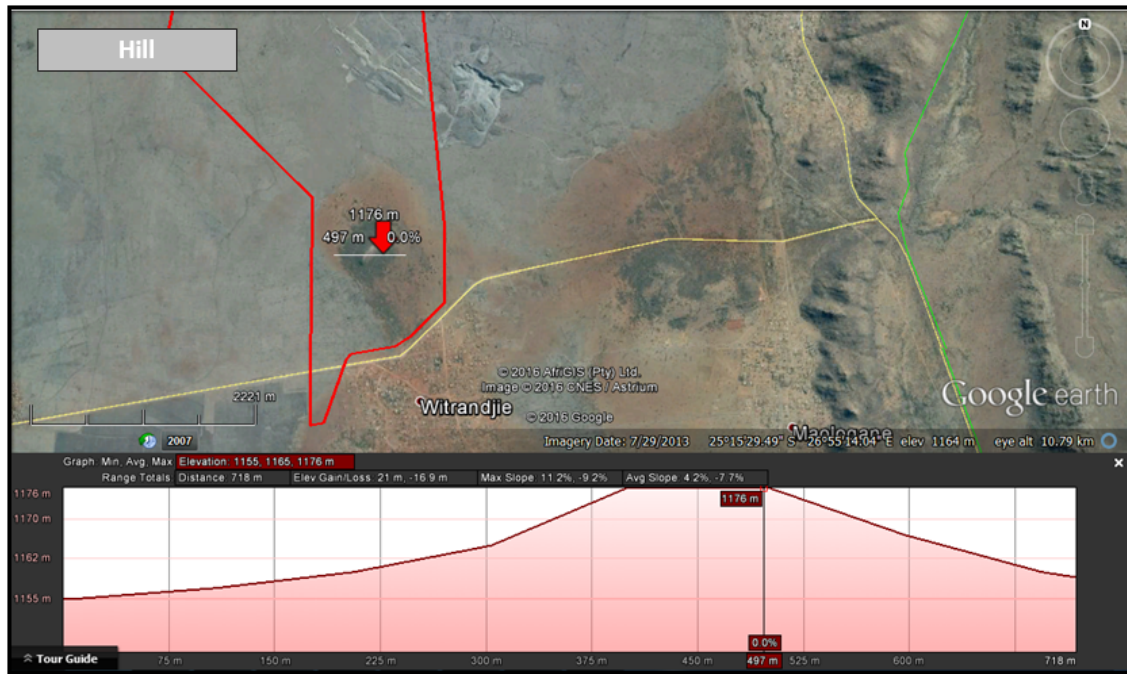
Altitude ranges between approximately 1129 – 1165 metres above ground level. The site slopes towards the north.

Figure 7: Elevation Profile



A small hill with a highest point at an altitude of 1174 m above ground level is present to the centre of the site at the eastern boundary.

**Figure 8: Elevation Profile of small hill on site**



### 8.3 CLIMATE

This section describes the typical weather at the Pilanesberg International Airport (Pilanesberg, South Africa) weather station over the course of an average year. It is based on the historical records from 2009 to 2012.

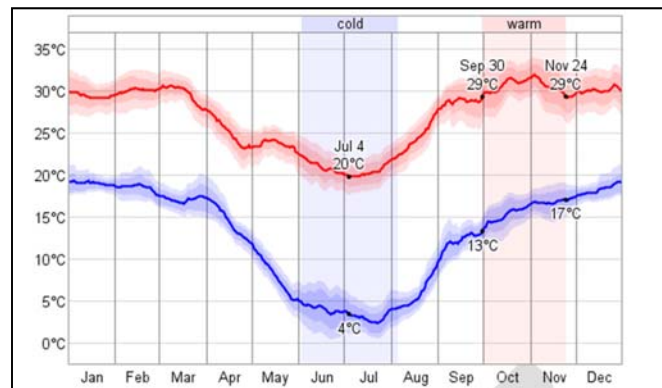
Pilanesberg has a warm temperate climate with dry winters and hot summers.

#### *Temperature*

Over the course of a year, the temperature typically varies from 2°C to 32°C and is rarely below 0°C or above 34°C.

Figure 9 presents the daily average low (blue) and high (red) temperature with percentile bands (inner band from 25th to 75th percentile, outer band from 10th to 90th percentile).

**Figure 9: Average low and high temperature (Pilanesberg Airport)**

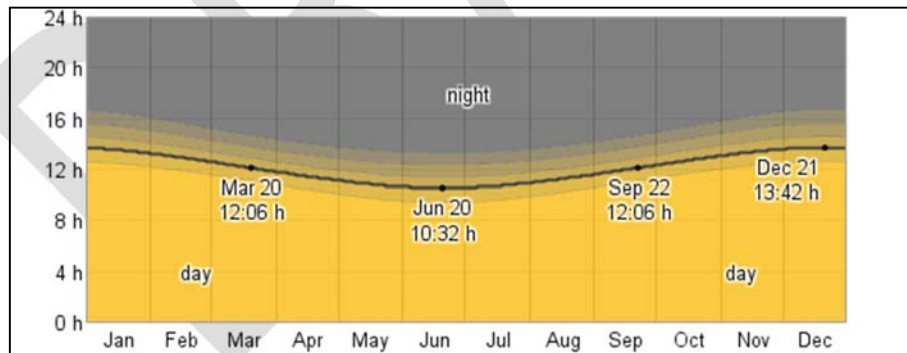


The *warm season* lasts on average from September 30 to November 24 with an average daily high temperature above 30°C. The hottest day of the year is November 3, with an average high of 32°C and low of 17°C. On average the *cold season* lasts from June 3 to August 5 with an average daily high temperature below 22°C. The coldest day of the year is July 23, with an average low of 2°C and high of 20°C.

### Sun

The length of the day varies significantly over the course of the year. The shortest day is June 20 with 10:33 hours of daylight; the longest day is December 21 with 13:43 hours of daylight.

**Figure 10: Daily Hours of Daylight and Twilight**



The *earliest sunrise* is at 5:12am on November 30 and the latest sunset is at 7:07pm on January 15. The latest sunrise is at 6:58am on July 4 and the earliest sunset is at 5:28pm on June 7.

### **Precipitation**

The probability that precipitation will be observed at this location varies throughout the year. Precipitation is most likely around November 21, occurring in 10% of days. Precipitation is least likely around August 25, occurring in 1% of days.



Over the entire year, the most common forms of precipitation are light rain and moderate rain.

*Light rain* is the most severe precipitation observed during 62% of those days with precipitation. It is most likely around April 13, when it is observed during 5% of all days.

*Moderate rain* is the most severe precipitation observed during 30% of those days with precipitation. It is most likely around November 14, when it is observed during 3% of all days.

During the warm season, which lasts from September 30 to November 24, there is a 6% average chance that precipitation will be observed at some point during a given day. When precipitation does occur it is most often in the form of light rain (56% of days with precipitation have at worst light rain), moderate rain (31%), and drizzle (12%).

**Figure 11: Probability of Precipitation at Some Point in the Day**



During the *cold season*, which lasts from June 3 to August 5, there is a 3% average chance that precipitation will be observed at some point during a given day. When precipitation does occur it is most often in the form of light rain (100% of days with precipitation have at worst light rain).

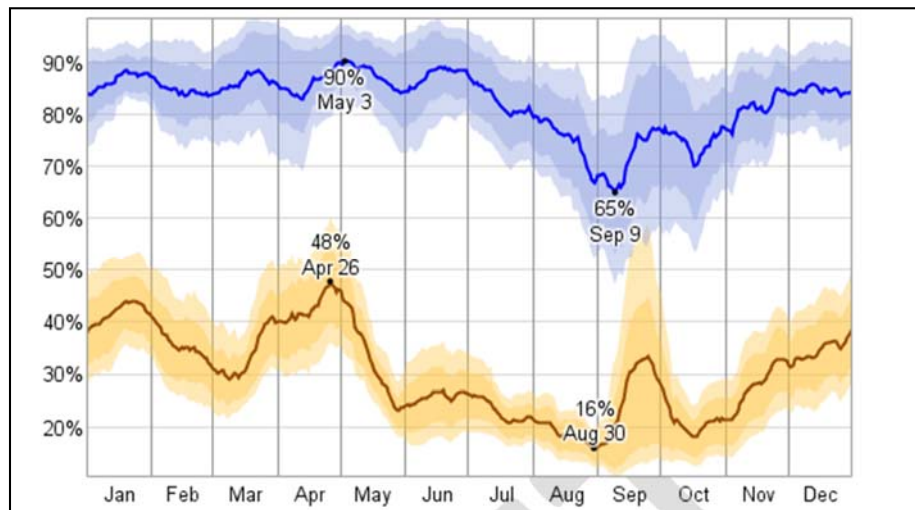
### **Humidity**

The relative humidity typically ranges from 16% (dry) to 90% (very humid) over the course of the year, rarely dropping below 11% (very dry) and reaching as high as 99% (very humid).

The air is *driest* around August 30, at which time the relative humidity drops below 18% (dry) three days out of four; it is *most humid* around May 3, exceeding 86% (very humid) three days out of four.



**Figure 12: Relative humidity**



The average daily high (blue) and low (brown) relative humidity with percentile bands (inner bands from 25th to 75th percentile, outer bands from 10th to 90th percentile).

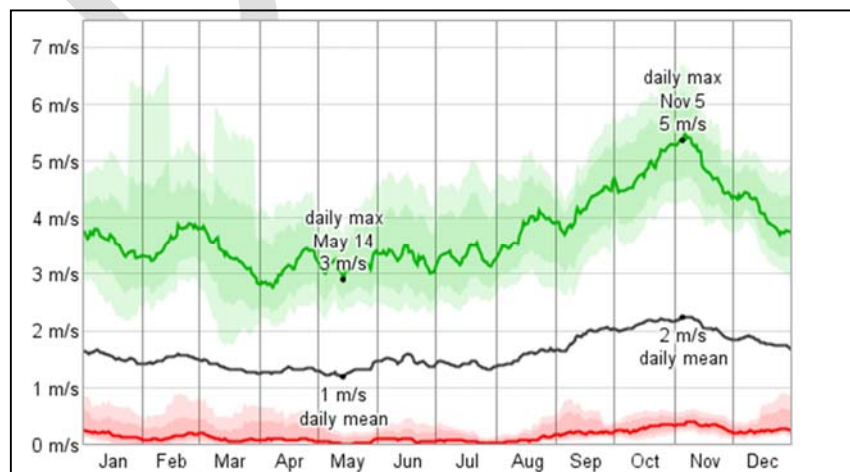
### **Wind**

Over the course of the year typical wind speeds vary from 0 m/s to 5 m/s (calm to moderate breeze), rarely exceeding 7 m/s (moderate breeze).

The *highest* average wind speed of 2 m/s (light breeze) occurs around November 5, at which time the average daily maximum wind speed is 5 m/s (gentle breeze).

The *lowest* average wind speed of 1 m/s (light air) occurs around May 14, at which time the average daily maximum wind speed is 3 m/s (light breeze).

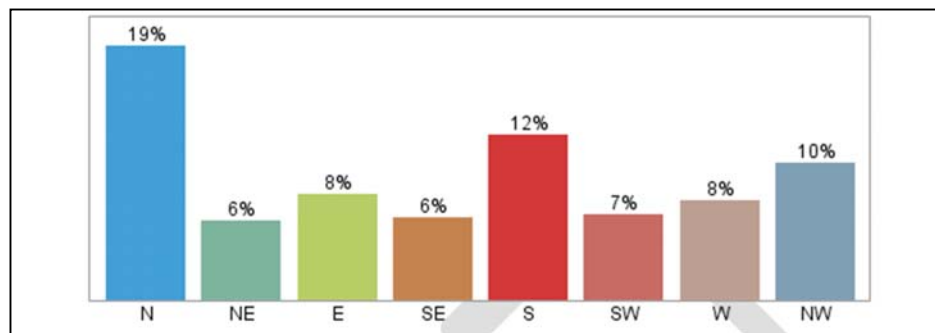
**Figure 13: Wind speed**



The average daily minimum (red), maximum (green), and average (black) wind speed with percentile bands (inner band from 25th to 75th percentile, outer band from 10th to 90th percentile).

The wind is most often out of the *north* (19% of the time), *south* (12% of the time), and *north west*(10% of the time).

**Figure 14: Wind directions over entire year**



#### **8.4 AIR QUALITY**

The Minister of Environment Affairs recently declared the Waterberg Priority Area for Air Quality Management (Government Notice 495 of 2012) The priority area included the following local municipalities in the Limpopo and North West Provinces:

- Thabazimbi (Limpopo)
- Modimolle (Limpopo)
- Mogalakwena (Limpopo)
- Bele-Bela (Limpopo)
- Mookgopong (Limpopo)
- Lephalale (Limpopo)
- Moses Kotane (North West)
- Rustenburg (North West)

Large Platinum mines are located in the District, predominantly in the Rustenburg area. Air quality monitoring is well established in Rustenburg. There a number of air quality monitoring stations in the area. Three stations are operated by Impala Platinum, four by Eskom (for Amplats) and one mobile caravan is operated by Lonmin. The stations are currently monitoring SO<sub>2</sub>, NO<sub>x</sub> and particulate emissions.

An emissions inventory for Bojanala Platinum District Municipality (BPDM) was compiled as part of the Air Quality Management Plan for the District. The main sources of air pollution were identified as:

- Industrial operations,
- Mining activities,
- Agricultural activities,
- Biomass burning (veld fires),
- Domestic fuel burning (particularly, coal),
- Vehicle tailpipe emissions,
- Waste treatment and disposal (landfills and incineration),
- Vehicle entrainment of dust from paved and unpaved roads,
- Other fugitive dust sources such as wind erosion of exposed areas.

Pollutants that are of particular concern for BPDM are SO<sub>2</sub>, NO<sub>2</sub> and PM<sub>10</sub>.

Major sources of air pollution in the immediate vicinity of the project site include emissions from various mining operations (Ruighoek and Benhaus Chrome Mines), vehicle tailpipe emissions (due to the vehicle activity along routes within the area), domestic fuel burning (related to neighbouring communities/settlements), biomass burning (veld fires in agricultural areas within the region), and various miscellaneous fugitive dust sources such as agricultural activities, wind erosion of open areas, and vehicle entrainment of dust along unpaved roads.

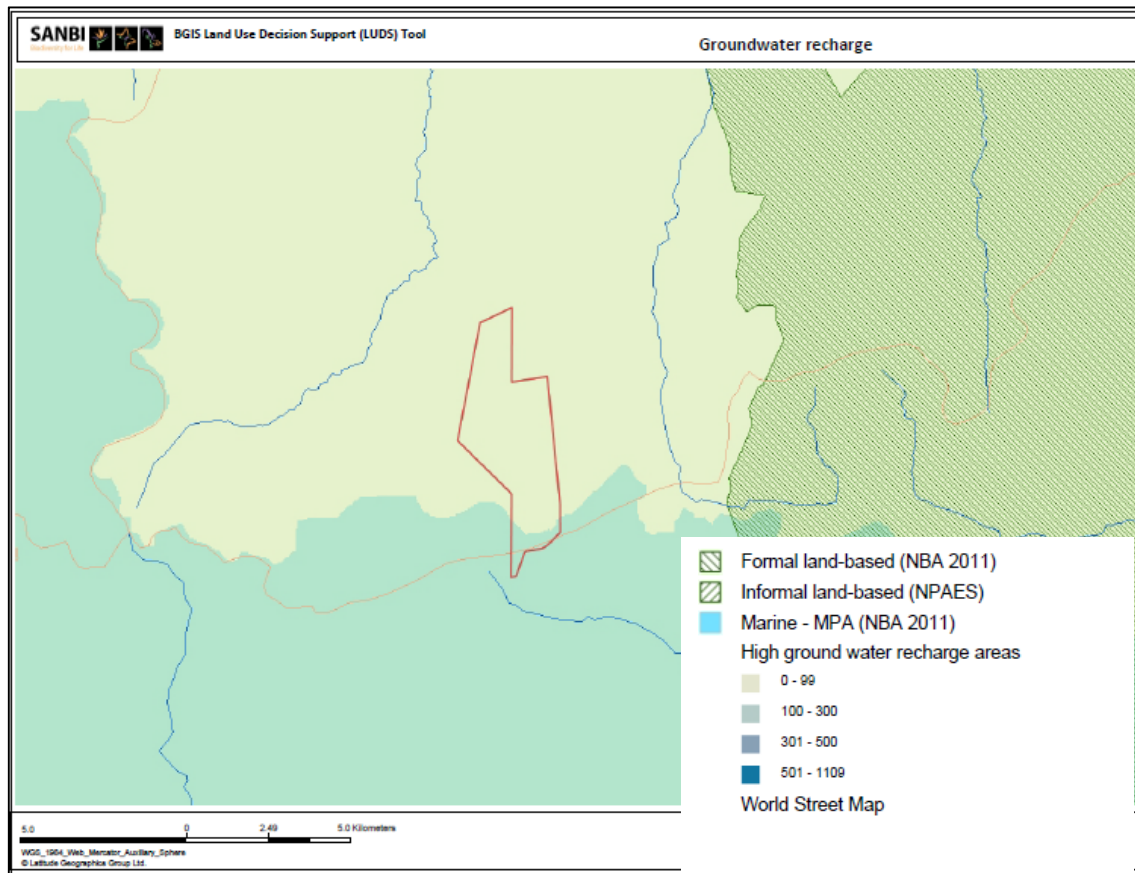
## **8.5 GROUNDWATER**

The application area is underlain by the gabbroic rocks of the Rustenburg Layered Suite belonging to the Bushveld Igneous Complex. On a regional scale the lithological units, structural geology and surface water features play a role in the location and flow of groundwater resources. Some of these features in the regional area include: the intrusion of dykes into the fractured and faulted zones, which also act as flow impediments; topographical low lying areas that are weathered and fractured and form an important aquifer zone for community water supply; the fractured bedrock aquifer that underlies the weathered zone; and the perennial river aquifer.

Two main aquifers have been identified in this area at depths ranging from 8.14m to 33.4m: a secondary fractured aquifer and weathered rock aquifer with average yields of 0.5l/s. The thickness of the saturated zone ranges from 0 – 20m. Porosity ranges from 1% to 25% and transmissivity is in

the order of 30m<sup>2</sup>/day to 150m<sup>2</sup>/day. The Mean Annual Precipitation (MAP) is 645mm and the regional recharge rate is estimated at 4.5% of the MAP per annum.

**Figure 15: Groundwater recharge**

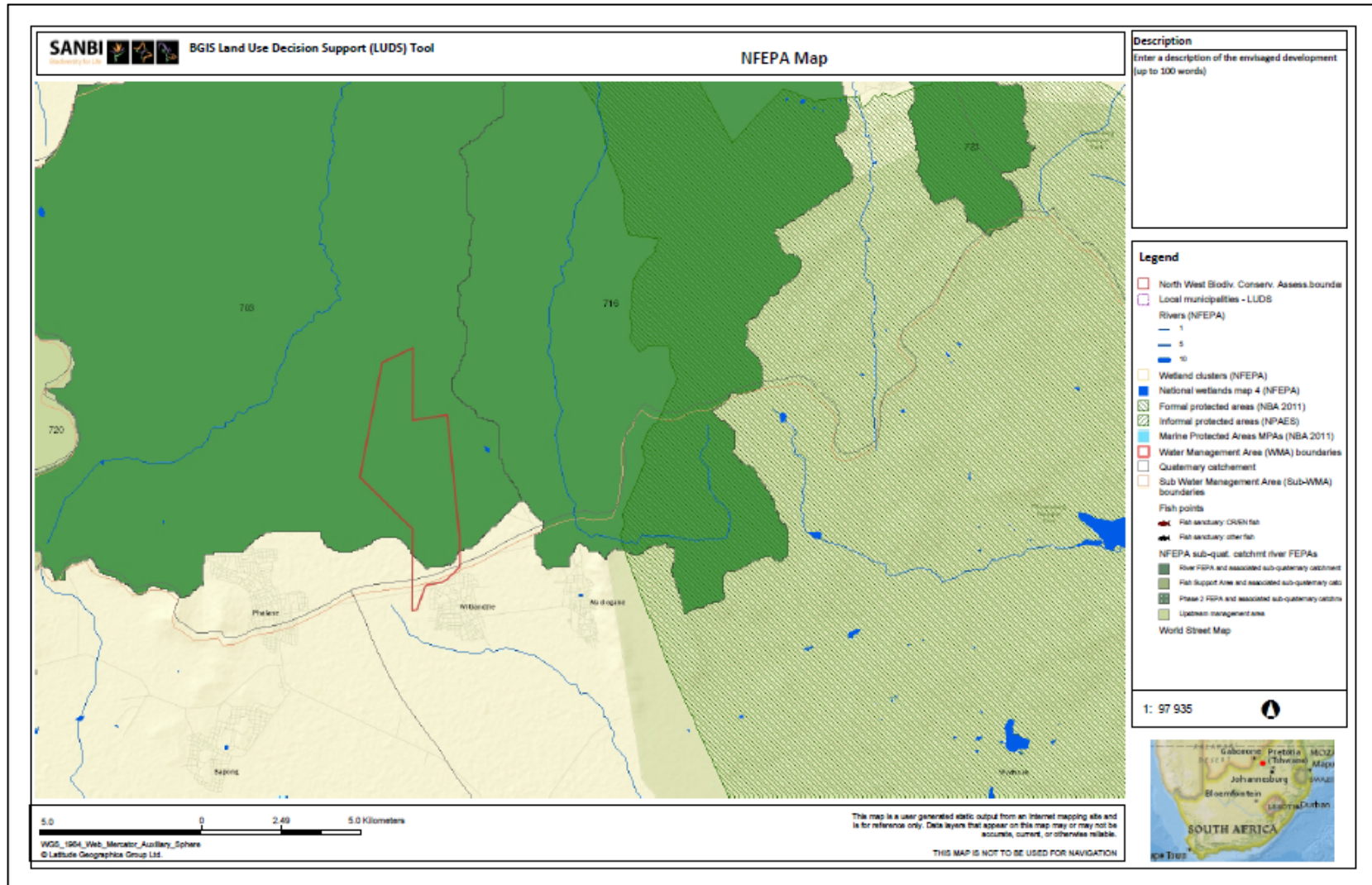


## 8.6 SURFACE WATER (RIVERS)

The proposed prospecting area falls within Crocodile (West) and Marico Water Management Areas and falls within the Elands River (A22) catchment. The Crocodile (West) Marico WMA stretches across three provinces: Gauteng, Northwest and Limpopo and comprises the Crocodile and Groot Marico Rivers.

The Elands sub-management area consists of the Elands River catchment which includes the tributaries of the Koster, Selons and Hex rivers. The Elands River is a tributary of the Crocodile River and the confluence is situated below Roodekopjes Dam. Large portions of this catchment are tribal areas. Rustenburg is the only major city in this sub-catchment and the major dams are Bospoort Dam on the Hex River and Vaalkop Dam on the Elands River. Mining of platinum and its associated platinum group of minerals are the dominant land-use in the catchment and is rapidly expanding (DWAf, 2005).

Figure 16: NFEPA Map





Water quality of the Elands River catchment is good in the upper reaches. However the middle and lower reaches are of a fair quality with mining activities in the catchment impacting on the river. Water quality has also deteriorated as a result of erosion and high sediment loads (DWA, 2012).

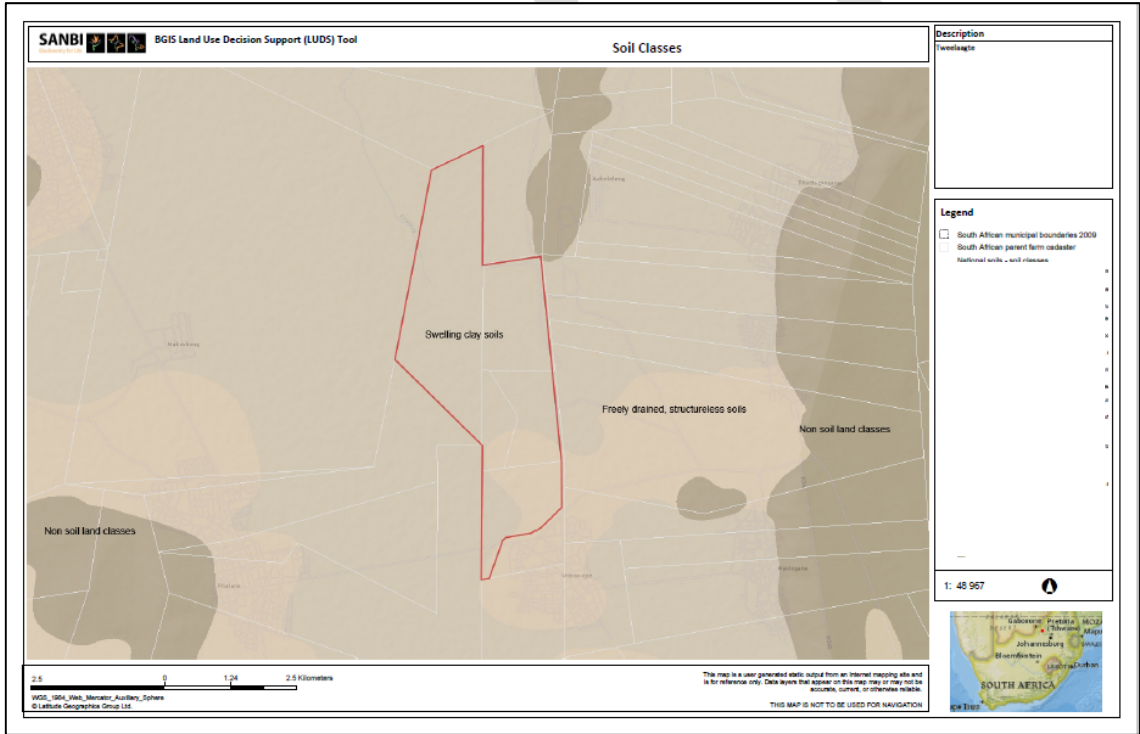
There are no rivers present on the site.

There are no wetlands on the site.

**8.7 SOILS**

The site consists of only one soil Class: Swelling Clay soils. This soil consists of strongly structured cracking soils, mainly dark coloured, dominated by swelling clays (vertic soils). They may occur associated with one or more of melanic and red structured soil. The soils have a high swell:shrink potential with a high natural fertility.

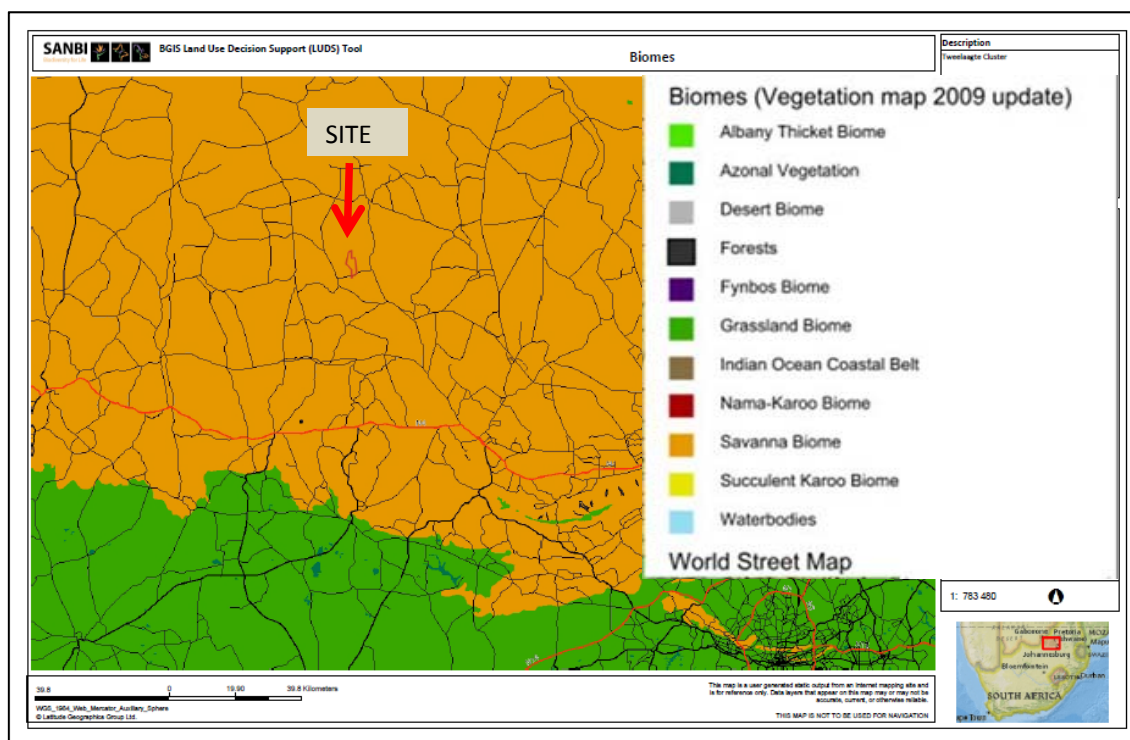
**Figure 17: Soil Class Map**



**8.8 VEGETATION (FLORA)**

The proposed site falls within the Savannah Biome.

**Figure 18: Biome Map**



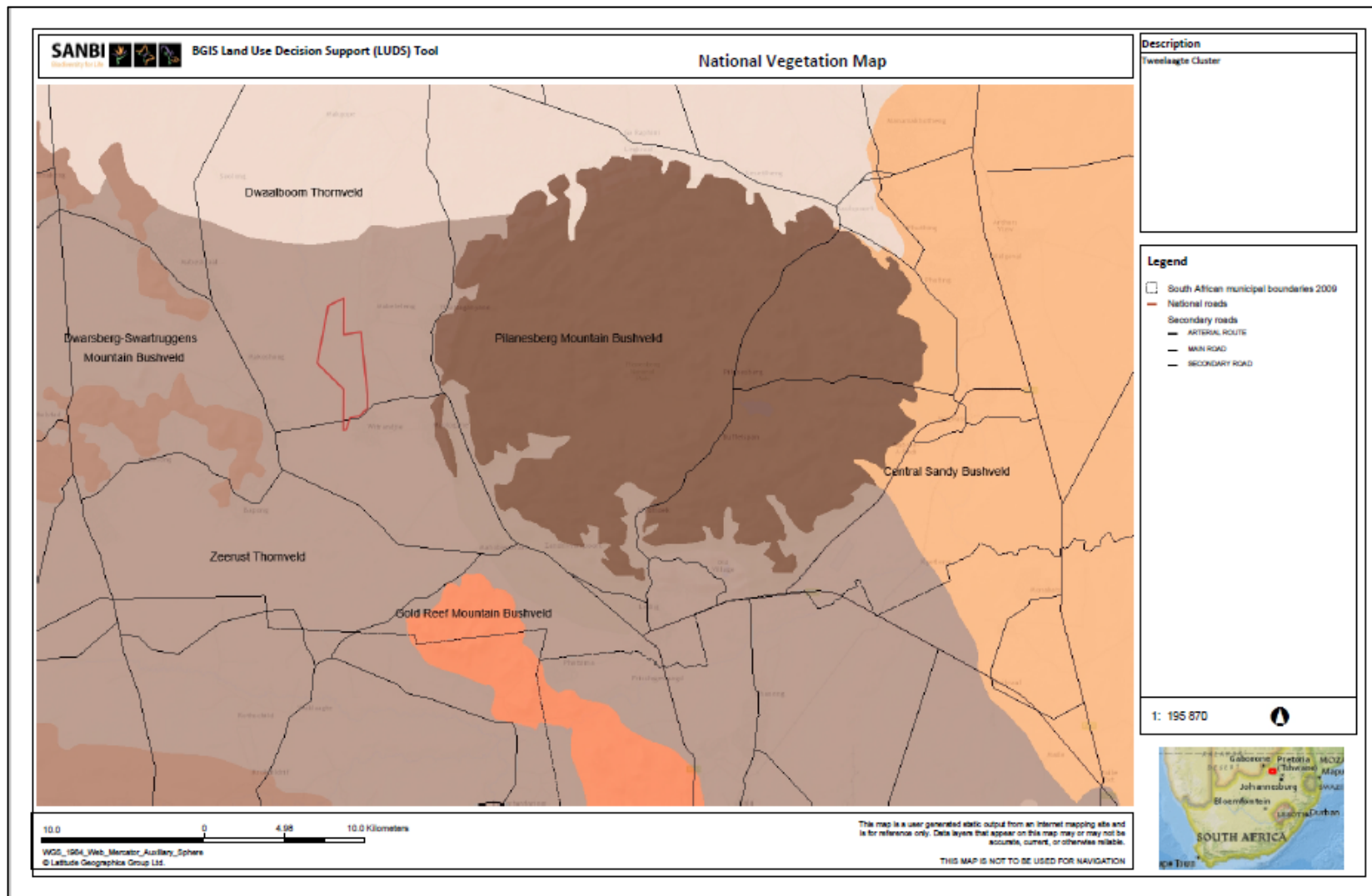
The site consists of Zeerust Thornveld (SVcb 3). Less than 4% of this vegetation type is statutorily conserved between four reserves including the Pienaar and Marico Bushveld Nature Reserves. Some 16% of the Zeerust Thornveld vegetation has been transformed mainly by cultivation, with some urban or built-up areas. The Vegetation is classified as Least Threatened with a conservation target of 19% (Mucina and Rutherford, 2006).

Zeerust Thronveld consists of deciduous, open to dense short thorny woodland, dominated by *Acacia* species with herbaceous layer of mainly grasses on deep, high base–status and some clay soils on plains and lowlands, also between rocky ridges of Dwarsberg- Swartruggens Mountain Bushveld (SVcb 4).

Key indicator species of this vegetation type include:

- **Tall Trees:** *Acacia burkei* (d), *A. erioloba* (d).
- **Small Trees:** *Acacia mellifera* subsp. *detinens* (d), *A. nilotica* (d), *A. tortilis* subsp. *heteracantha* (d), *Rhus lancea* (d), *Acacia fleckii*, *Peltophorum africanum*, *Terminalia sericea*.

Figure 19: Vegetation Map





- **Tall Shrubs:** *Diospyros lycioides* subsp. *lycioides*, *Grewia flava*, *Mystroxydon aethiopicum* subsp. *burkeanum*.
- **Low Shrubs:** *Agathisanthemum bojeri*, *Chaetacanthus costatus*, *Clerodendrum ternatum*, *Indigofera filipes*, *Rhus grandidens*, *Sida chrysantha*, *Stylosanthes fruticosa*. Graminoids: *Eragrostis lehmanniana* (d), *Panicum maximum* (d), *Aristida congesta*, *Cymbopogon pospischilii*.
- **Herbs:** *Blepharis integrifolia*, *Chamaecrista absus*, *C. mimosoides*, *Cleome maculata*, *Dicoma anomala*, *Kyphocarpa angustifolia*, *Limeum viscosum*, *Lophiocarpus tenuissimus*.

The online plant checklist on the website of The Plants of southern Africa provides taxonomic information drawn from the PRECIS database for plant species occurring in southern Africa.

The site provided plant species for the 2526BB and 2526BD quarter degree squares. Only one species was identified as being of conservation concern (declining)

- *Drimia altissima* (L.f.) Ker Gawl. - (HYACINTHACEAE) - Listed as Declining

**Figure 20: *Drimia altissima***



Source <http://redlist.sanbi.org/imgs/photos>

The species is considered to be declining because medium-large volumes of bulbs are evident in the medicinal markets, but the species appears to be widespread in southern Africa. It has experienced some decline in the past, but the extent and time frame are unknown, declines are not suspected to have exceeded 10% of the population (SANBI - <http://redlist.sanbi.org/>).

Searches of the following online databases on the Virtual museum website returned no records for the 2526BB and 2526BD quarter degree squares:

- Atlas of South African Mushrooms
- Atlas of African Orchids

The Virtual Tree Herbarium returned 23 records of tree species, but identification for all of these are still pending.

## 8.9 ANIMAL LIFE (FAUNA)

Fauna expected to occur on site include assemblages within terrestrial and riverine ecosystems, including mammals, birds, reptiles, amphibians and invertebrates.

A search of the online Virtual Museum of African Mammals provided the following results for mammal species spotted in the 2526BB and 2526BD quaternary degree squares

It should be noted that a portion of the Pilanesberg Nature Reserve also fall within the 2526BB and 2526BD quarter degree squares and the records could represent species identified on this reserve.

**Table 2: Mammals spotted in 2526BB and 2526BD**

| Scientific name                       | Common Name               | Family     | Possibility to occur on proposed prospecting site   |
|---------------------------------------|---------------------------|------------|---|
| <i>Panthera leo</i>                   | Lion                      | Felida     | Not expected due to agricultural activities on site |
| <i>Hyaena brunnea</i>                 | Brown Hyena               | Hyaenidae  | Not expected due to agricultural activities on site |
| <i>Equus quagga</i>                   | Plains Zebra              | Equidae    | Not expected due to agricultural activities on site |
| <i>Giraffa camelopardalis giraffa</i> | The South African Giraffe | Giraffidae | Not expected  |
| <i>Aepyceros melampus</i>             | Impala                    | Bovidae    | Not expected  |
| <i>Felis silvestris</i>               | Wildcat                   | Felidae    | Possible visitor                                    |
| <i>Phacochoerus africanus</i>         | Common Wart-hog           | Suidae     | Possible  |

| Scientific name                            | Common Name                                      | Family          | Possibility to occur on proposed prospecting site |
|--|--|-----------------|---|
| <i>Chlorocebus pygerythrus pygerythrus</i> | Vervet Monkey                                    | Cercopithecidae | Possible  |
| <i>Herpestes sanguineus</i>                | Slender Mongoose                                 | Herpestidae     | Possible  |
| <i>Genetta maculata</i>                    | Common Large-spotted Genet / Rusty-spotted Genet | Viveridae       | Possible visitor                                  |
| <i>Canis mesomelas</i>                     | Black-backed Jackal                              | Canidae         | Possible visitor                                  |

Searches of the following online databases on the Virtual museum website returned no records for the 2526BB and 2526BD quarter degree squares:

- Atlas of the Neuroptera and Megaloptera
- Odanata Atlas of Southern Africa
- Atlas of African Spiders
- Atlas of African Scorpions
- Frog Atlas of Southern Africa

The Reptile Atlas of Southern Africa returned one record for the 2526BB quarter degree square:

- *Kinixys lobatsiana* - Lobatse Hinged Tortoise (Testudinidae)

A few Lepidoptera species were identified and submitted to the Atlas of Lepidoptera:

- For the 2526BB QDS - *Tuxentius melaena melaena* - Black pie - Swart-bontetjie (LYCAENIDAE) & *Metisella willemi* - Netted sylph - Net-walsertjie (HESPERIIDAE)
- For the 2526BD QDS - *Colotis annae annae* Scarlet tip Skarlakenpuntjie (PIERIDAE)

Additional information on the occurrences of animal species on the proposed site will be added as new information is gathered and received from land owners.

### **Birds**

A search of the online Photos of Weaver Nests database indicated that weaver nests for the following weavers were spotted in the 2526BB quarter degree square.

- *Ploceus velatus* - Southern Masked Weaver

The Bird Picture Archive returned the following records for the 2526BB quarter degree square:

- *Ploceus velatus* - Southern Masked-Weaver - Swartkeelgeelvink (Ploceidae)
- *Corvus albus* Pied Crow Witborskraai (Corvidae)
- *Corythaixoides concolor* Grey Go-away-bird Kwêvoel (Musophagidae)

A total of 340 bird species were recorded for the pentads (2510\_2650 & 2515\_2650) as part of the Bird Atlas 2 project.

Of the birds recorded only eight are of conservation concern:

- *Polemaetus bellicosus* - Martial Eagle - Endangered
- *Aquila verreauxii* - Verreaux's Eagle - Vulnerable
- *Pterocles gutturalis* - Yellow-throated Sandgrouse - Near Threatened
- *Gyps coprotheres* - Cape Vulture - Endangered
- *Torgos tracheliotus* - Lappet-faced Vulture - Endangered
- *Gyps africanus* - White-backed Vulture - Endangered
- *Anthropoides paradiseus* - Blue Crane - Near Threatened
- *Sagittarius serpentarius* - Secretary bird - Vulnerable

As mentioned the proposed site is located approximately 4km from Pilanesburg Nature Reserve. Of the above mentioned bird species two are confirmed to be breeding in the reserve (the Martial Eagle and Secretary Bird), one is listed as possible breeding (Verreaux's Eagle) and all the vultures have been spotted in the reserve as well. Only two of the eight species have not been spotted in the reserve, the Yellow-throated Sandgrouse and the Blue Crane.

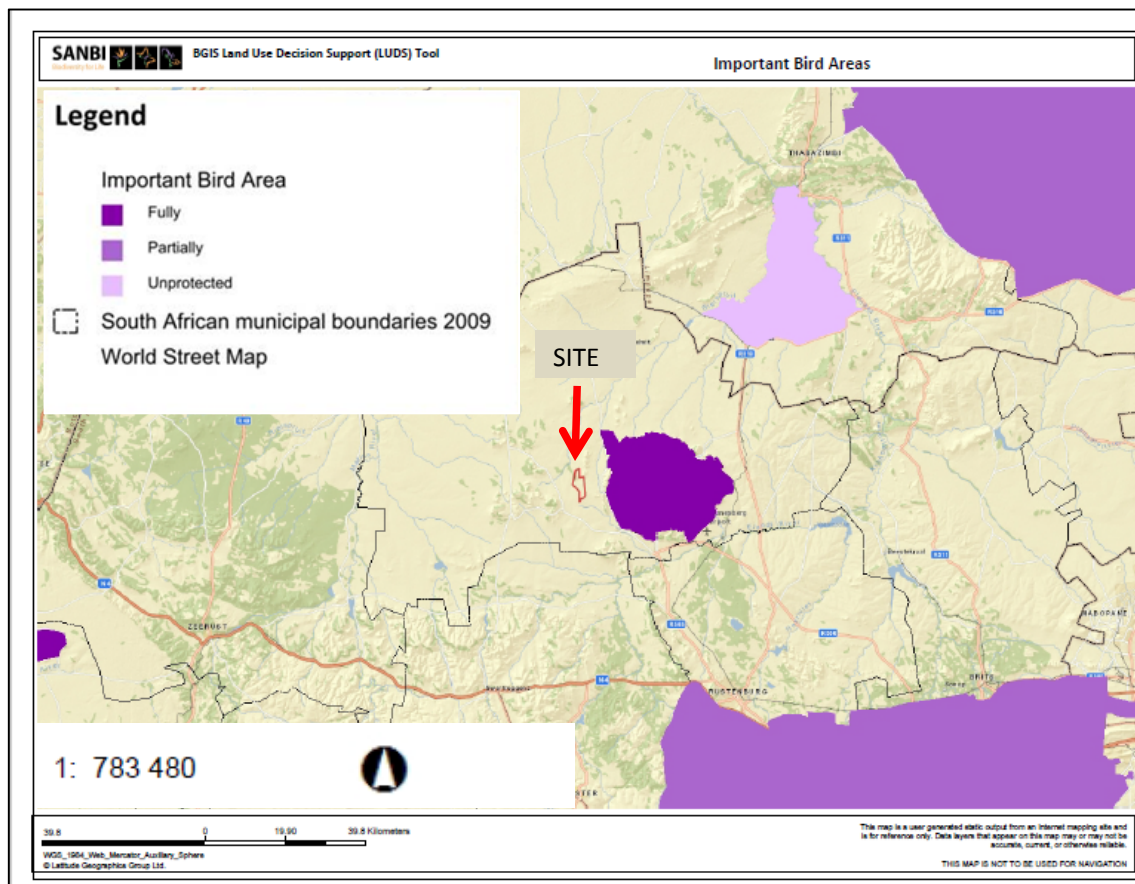
The Yellow-throated Sandgrouse inhabits short open grassland, fallow fields and recently burnt veld, especially on black clay soils, usually near water. This species has an extremely large range and it is not expected the species will be found on the site due to the absence of natural wetlands and surface water areas. They are usually found in pairs or small groups on short grass plains feeding on seeds but gathers in flocks to fly to water holes mid-morning. These birds usually nests in the dry season in a small scrape or hollow in the ground.

The Blue Crane is endemic to southern Africa with most of its range falling in South Africa. It is found in natural vegetation in the Karoo and grassland biomes, but it also feeds in crop fields. The

nest is a thinly lined scrape on dry ground or pad of vegetative material on marshy ground. One or two eggs are laid October to February. Due to the absence of marshy grounds it is not expected that the blue crane will be breeding on the proposed prospecting site.

The site is not located in an Important Bird Area.

**Figure 21: Important Bird Area Map**



## 8.10 BIODIVERSITY

The purpose of North-West Province Biodiversity Conservation Assessment project was to finalize the biodiversity conservation assessment (version 1) for the North-West Province which will be used to inform the development of the Provincial Biodiversity Sector plans and bioregional plans. This will also be used to inform Spatial Development Frameworks (SDFs), Environmental Management Frameworks (EMFs), Strategic Environmental Assessments (SEAs) and in the Environmental Impact Assessment (EIA) process in the province.

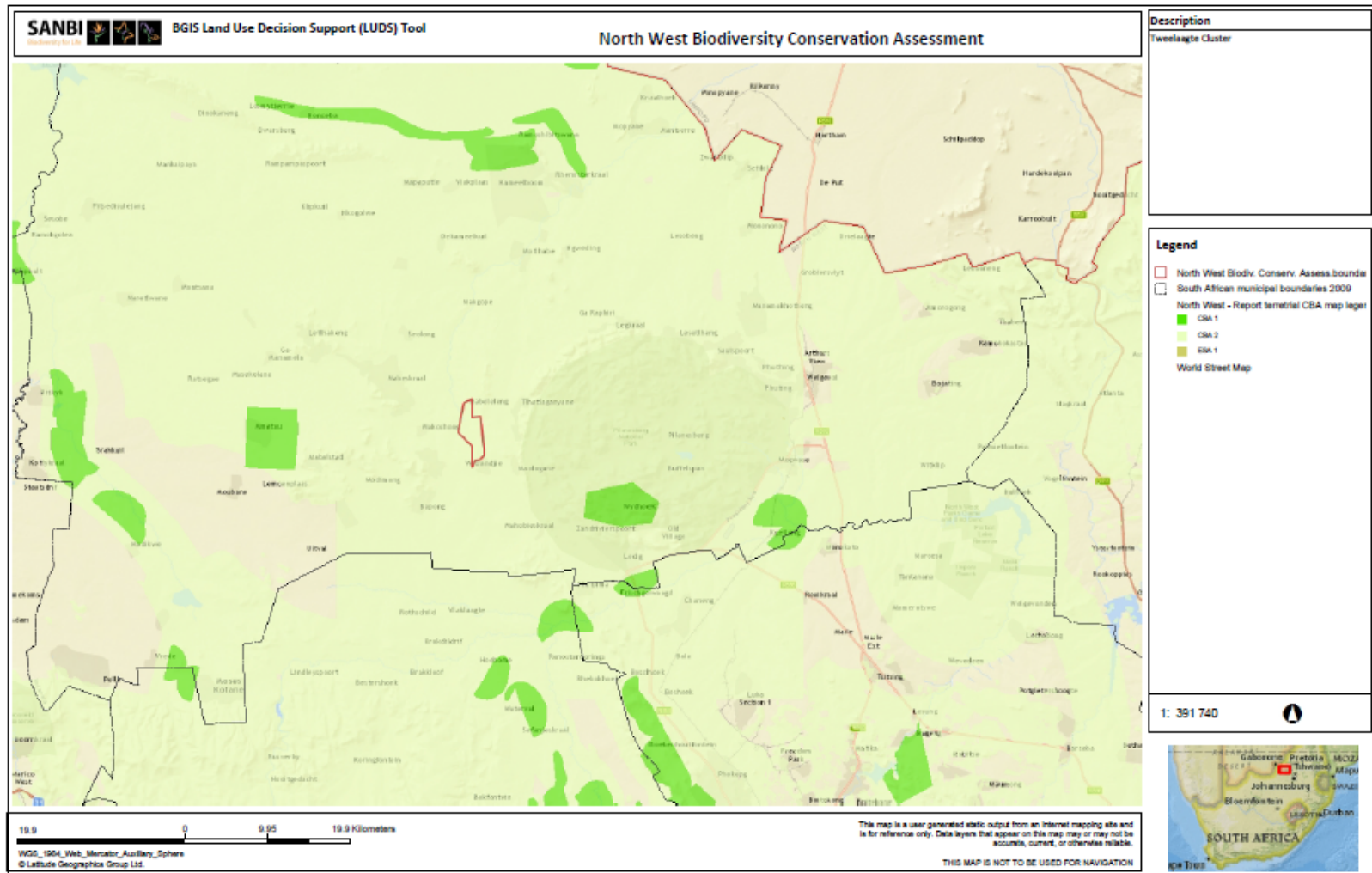
The North-West province is very rapidly approaching a critical threshold (60% natural habitat remaining) in the state of biodiversity within the province. Lack of capacity, resources and

biodiversity information, and a significantly under representative protected area network in the province is hampering the province's ability to effectively manage biodiversity in this rapidly changing landscape. This biodiversity assessment through the development of a critical biodiversity area map for the province is aimed at assisting biodiversity and land use managers and decision makers in this demanding task.

The proposed prospecting site falls within a Critical Biodiversity Area 2 as identified in the North-West Province Biodiversity Conservation Assessment. CBA 2 areas are near-natural landscapes where the ecosystems and species largely intact and undisturbed. These areas have intermediate irreplaceability or some flexibility in terms of area required to meet biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising our ability to achieve targets. These are landscapes that are approaching but have not passed their limits of acceptable change.

The information content of the CBA map is limited by the depth of knowledge on the distribution of biodiversity in the province captured in electronic databases. Note that the biodiversity knowledge base for the NW Province is very limited.

Figure 22: North West Biodiversity Assessment Map





## 8.11 SENSITIVE ENVIRONMENTS

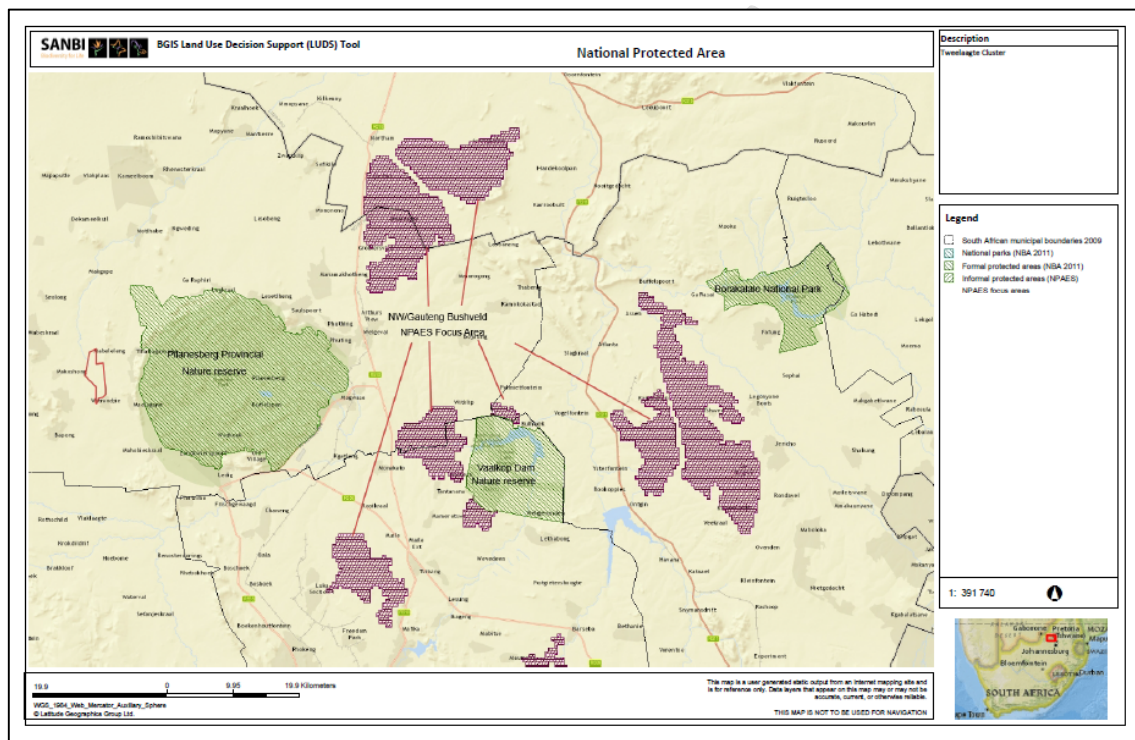
### *Ecosystem Status*

There are no threatened ecosystems in the Moses Kotane Municipality.

### *Protected Areas*

The proposed site is located approximately 4,5km form the Pilanesberg Provincial Nature Reserve.

**Figure 23; Protected Areas Map**



### *Mining and Biodiversity Guideline, 4 October 2012*

The Mining and Biodiversity Guideline & associated Maps were developed to facilitate the sustainable development of South Africa's mineral resources in a way that enables regulators, industry and practitioners to minimise the impact of mining on the country's biodiversity and ecosystem services. The document was approved by MINMEC on 4 October 2012 and was formally launched in 2013.


The Guideline provides the mining sector with a practical, user-friendly manual for integrating biodiversity considerations into the planning processes and managing biodiversity during the operational phases of a mine, from exploration through to closure. The Guideline provides explicit direction in terms of where mining-related impacts are legally prohibited, where biodiversity priority



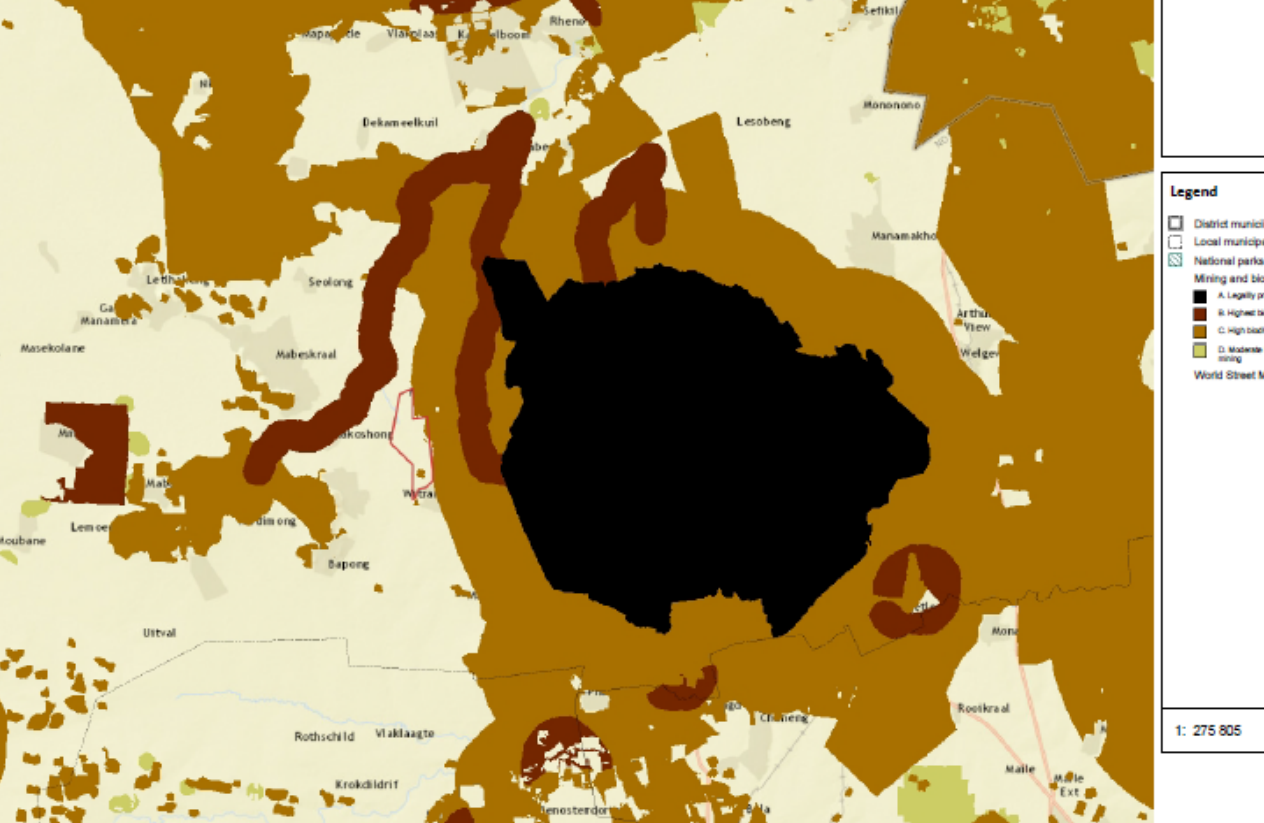
areas may present high risks for mining projects, and where biodiversity may limit the potential for mining.

The Guideline distinguishes between four categories of biodiversity priority areas in relation to the importance from a biodiversity and ecosystem service point of view as well as the implications for mining. It gives direction on how to avoid, minimise or remedy mining impacts, as part of a thorough environmental impact assessment and robust environmental management programme. The mitigation of negative impacts on biodiversity and ecosystem services is a legal requirement and should take on different forms depending on the significance of the impact and the area being affected. Mitigation requires proactive planning that is enabled by following the mitigation hierarchy. Its application is intended to avoid disturbance of ecosystems and loss of biodiversity, and where they cannot be avoided altogether, to minimise, rehabilitate or offset negative impacts on biodiversity.

The map below indicates the classification of the proposed prospecting area in accordance with the Mining and Biodiversity Guideline. The site falls mainly outside areas of biodiversity importance in terms of the guidelines except for a very small portion which is most likely the small hill that is located in the centre of the site close to the eastern boundary.

**SANBI**  **BGIS Land Use Decision Support (LUDS) Tool**

**Mining Biodiversity Guideline**



**Description**  
Tloeeeng Cluster

**Legend**

- District municipality
- Local municipalities
- National parks (NBA 2011)

**Mining and biodiversity guidelines**

- A. Legally protected - mining prohibited
- B. Highest biodiversity importance - highest risk for mining
- C. High biodiversity importance - high risks to mining
- D. Moderate biodiversity importance - moderate risk to mining

World Street Map

1: 275 805

14.0 0 7.01 14.0 Kilometers

WGS\_1984\_VWeb\_Mercator\_Auxiliary\_Sphere  
© Lettitude Geographics Group Ltd.

This map is a user generated static output from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

## 8.12 SOCIO-ECONOMIC ENVIRONMENT

The proposed site is located in Ward 26, Moses Kotane Local Municipality.

According to Census 2011, Moses Kotane Local Municipality has a total population of 242,554 people and Ward 26 has a population of 7,583. The ratio of men to woman are summarised in the table below:

**Table 3: Population size & ratio**

| Moses Kotane Local Municipality | Moses Kotane, Ward 26 |
|---------------------------------|-----------------------|
| 1: 1.01                         | 1:1.06                |

It is reported that 418 (5.5%) people living in Moses Kotane Ward 26, had no schooling.

Key statistics for the Moses Kotane Local Municipality is based on the 2001 and 2011 censuses are presented in the tables below:

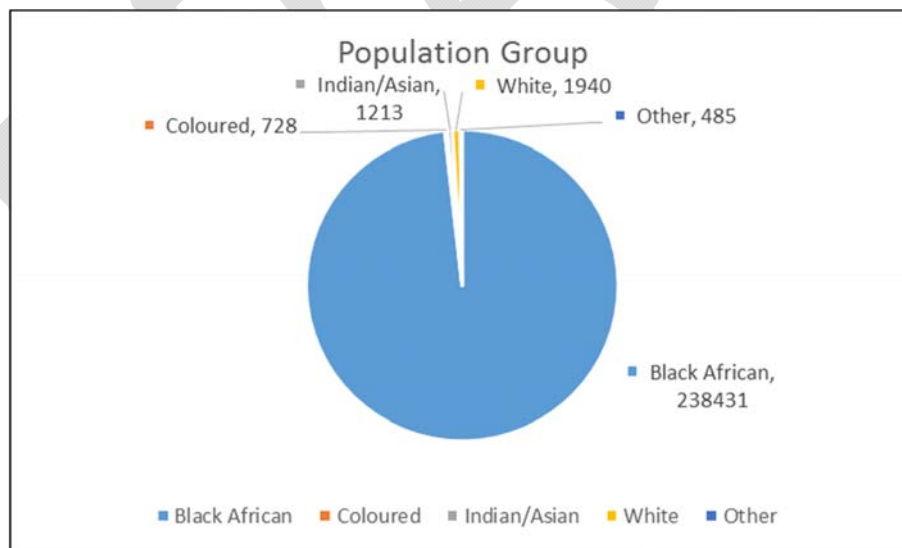
**Table 4: Key statistics for Moses Kotane Municipality**

| Description                                   | 2011    | 2001    |
|---|---------|---------|
| Total population                              | 242,554 | 237,175 |
| Young (0-14)                                  | 29,2%   | 32,4%   |
| Working Age (15-64)                           | 63,1%   | 63,1%   |
| Elderly (65+)                                 | 7.7%    | 6,9%    |
| Dependency ratio                              | 58,6%   | 64,8    |
| Sex ratio                                     | 98,8    | 95,3    |
| Population density (persons/km <sup>2</sup> ) | 42      |         |
| Unemployment rate                             | 37,9%   | 50,9%   |
| Youth unemployment rate                       | 47,4%   | 63,7    |
| No schooling aged 20+                         | 9,3%    | 18,8%   |
| Higher education aged 20+                     | 5,3%    | 5,8%    |
| Matric aged 20+                               | 27,4%   | 18,9%   |
| Number of households                          | 75,193  | 61,759  |

| Description                        | 2011   | 2001  |
|------------------------------------|--------|-------|
| Number of Agricultural households  | 20,846 |       |
| Average household size             | 3,2    | 3,7   |
| Female headed households           | 44,1%  | 49,1% |
| Formal dwellings                   | 78,3%  | 77,9% |
| Housing owned/paying off           | 62,3%  | 68,5% |
| Flush toilet connected to sewerage | 12,3%  | 10,1% |
| Weekly refuse removal              | 80,8%  | 8,2%  |
| Piped water inside dwelling        | 18,6%  | 8,3%  |
| Electricity for lighting           | 89,9%  | 91,2% |

According to the 2011 Census, Moses Kotane Local Municipality has a total population of 242,554 people, of which 98,3% are black African, 0,8% are white, with the other population groups making up the remaining 0,9 %.

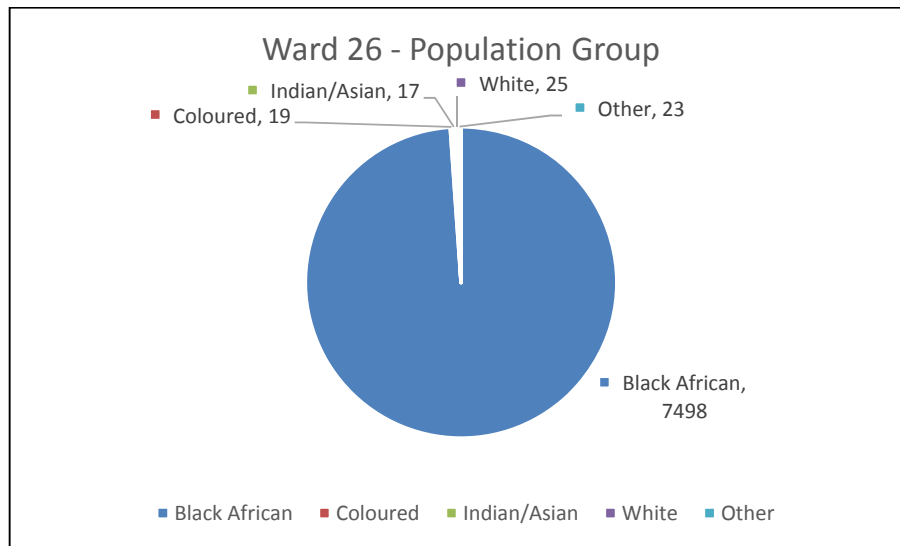
**Figure 25: Moses Kotane Local Municipality Population Groups**



Source: Census 2011

Ward 26 has a population size of 7,583 people. The split amongst the population groups are presented below:

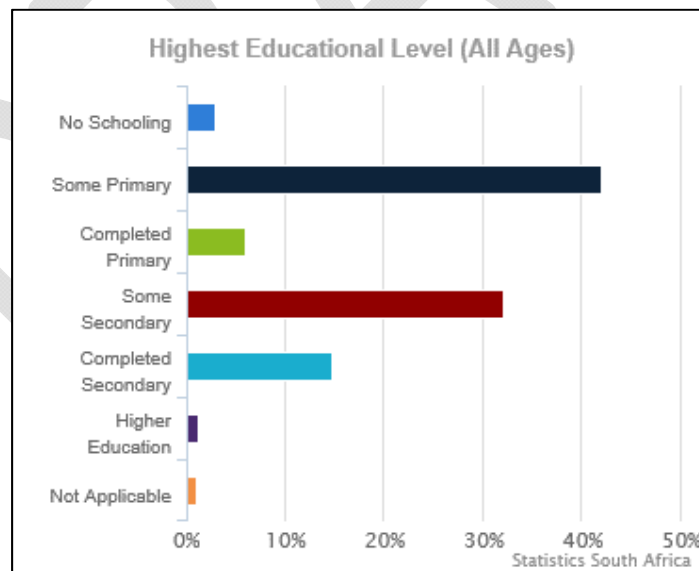
**Figure 26: Ward 26 Population Groups**



Source: Census 2011

In the municipality, of those aged 20 years and older, 9,3% have no schooling, 17,1% have some primary school education, 35,3% have some secondary education, 27,4% have completed matric, and 5,3% have some form of higher education.

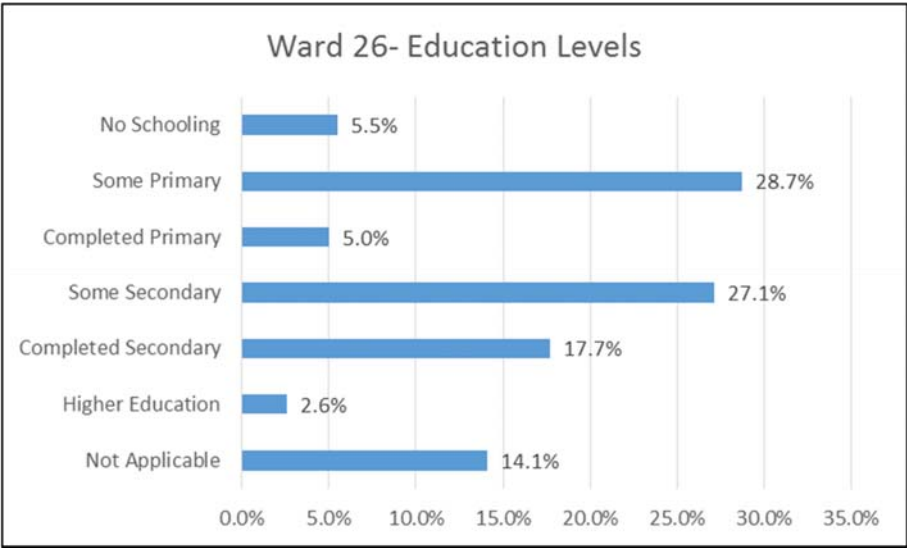
**Figure 27: Moses Kotane Local Municipality Education level**



Source: Census 2011

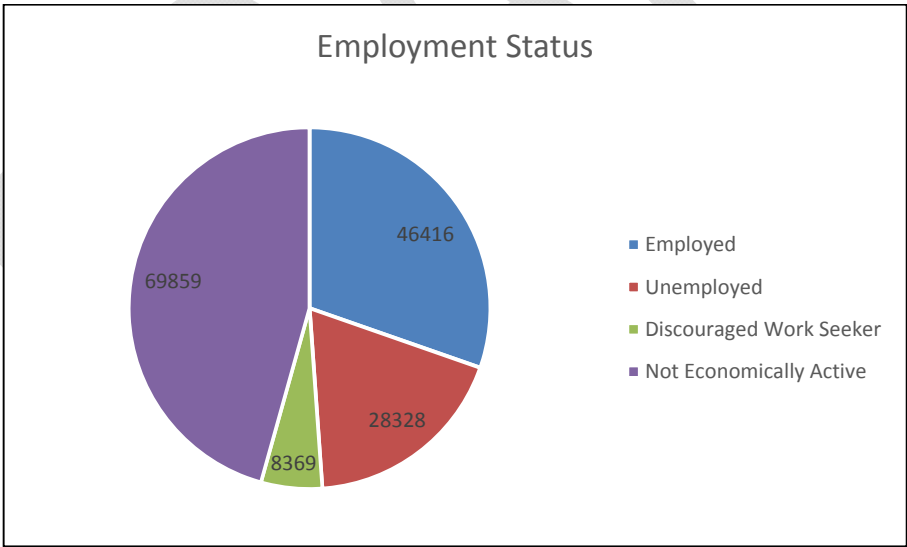
In Ward 26 27.1% the highest percentage of people has completed some form of secondary education, 17.7% has completed secondary education and only 2.6% has completed some form of higher education.

**Figure 28: Ward 26 Education Level**

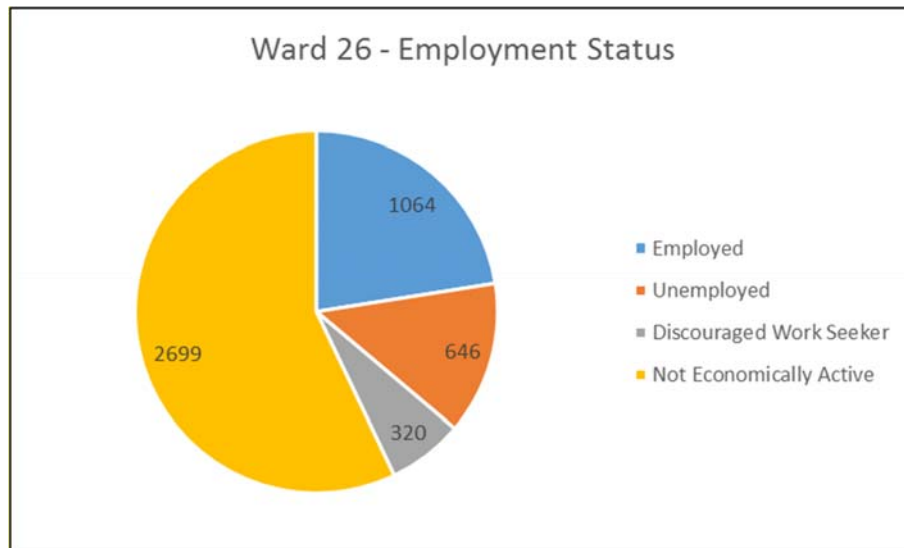


In the Moses Kotane Local Municipality 74,744 people are economically active (employed or unemployed but looking for work), and of these 37,9% are unemployed. Almost half (47,4%) of the economically active youth (15 – 34 years) in the municipality are unemployed.

**Figure 29: Moses Kotane Local Municipality Employment Status**



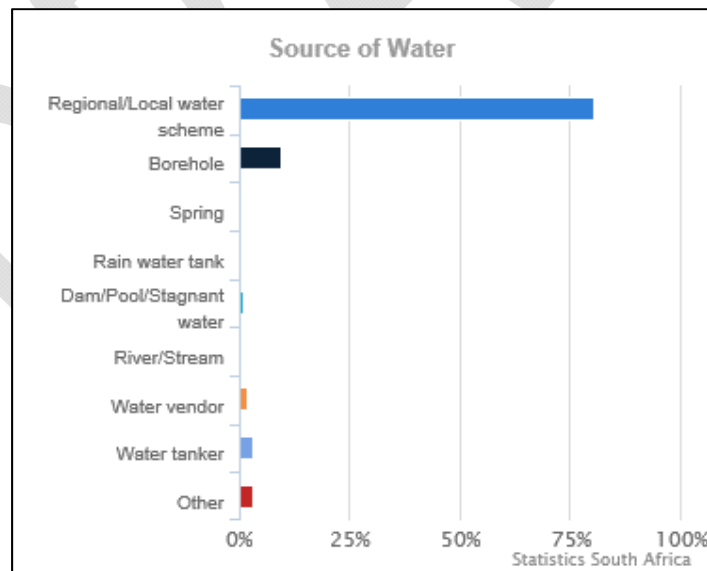
**Figure 30: Ward 26 Employment Status**



There are 75,193 households in the municipality, with an average household size of 3,2 persons per household. Nearly 81% of households (80,7%) have access to piped water either in their dwellings or in the yard.

About 90% of households (89,9%) have access to electricity for lighting.

**Figure 31: Moses Kotane Local Municipality Source of Water**



### **8.13 CULTURAL ENVIRONMENT**

The North-West Province of South Africa has a rich heritage comprised of remains dating from the pre-historic and from the historical (or colonial) periods of South Africa. Pre-historic and historical



remains in the North-West Province present a record of the heritage of most groups living in South Africa today.

A number of heritage impact assessments studies have been done in the larger Project Area, some of which are listed below:

- Heritage Assessment 2008. Horizon Chrome Mine on portions of the farm Ruighoek 169JP, Pilanesberg North West Province. Matakoma-ARM on behalf of Wits Enterprises
- Pistorius, J.C.C. 2007. A Phase I Heritage Impact Assessment (HIA) study for the proposed new Sedibelo Platinum Mine near the Pilanesberg in the North-West Province of South Africa. Unpublished report prepared for Barrick Platinum.
- Pistorius, J.C.C. 2007. A Phase I Heritage Impact Assessment (HIA) study for Batlhako Mining Limited on the farm Ruighoek 169JP near the Pilanesberg in the North-West Province. Unpublished report prepared for Golder Associates (Africa) Ltd..
- Pistorius, J.C.C. 2008. A Phase I Heritage Impact Assessment (HIA) study for a proposed new sport complex and associated facilities in Saulspoort near the Pilanesberg in the North-West Province of South Africa. Unpublished report prepared for Metago Environmental Engineers.
- Pistorius, J.C.C. 2010. A Phase I Heritage Impact Assessment (HIA) study for the farm Magazynskraal 3JQ near the Pilanesberg in the North-West Province of South Africa. Unpublished report prepared for Metago Environmental Engineers.
- Pistorius, J.C.C. 2010. Mitigating and managing heritage resources within the Horizon Chrome Mine on Portions of the farm Ruighoek 169JP near the Pilanesberg in the North-West Province. Unpublished report prepared for Natural Scientific Services (NSS).
- Pistorius, J.C.C. 2011. A Phase I Heritage Impact Assessment (HIA) study for Lonmin Platinum's proposed exploration activities on the farm Vlakfontein 207JP and Diamand 206JP near the Pilanesberg in the North-West Province. Unpublished report prepared for Lonmin Platinum.
- Pistorius, J.C.C. 2011. Follow-up report on Lonmin's exploration activities on Vlakfontein 207JP and Diamand 206JP near the Pilanesberg in the North-West Province: completion of exploration activities during 2011. Unpublished report prepared for Lonmin Platinum.

- Pistorius, J.C.C. 2012. A Phase I Heritage Impact Assessment (HIA) study for chrome mining activities on various portions of the farms Groenfontein 138JP, Vlakfontein 163JP and Vogelstruisnek 174JP west of the Pilanesberg in the North-West Province of South Africa. Unpublished report prepared for Golder Associates (Africa) Ltd.
- Pistorius, CC. 2013. An Updated Phase I Heritage Impact Assessment (Hia) Study for Pilanesberg Platinum Mine (Ppm) near the Pilanesberg in the North-West Province Of South Africa. report prepared for SLR Consulting (Africa) (Pty) Ltd.

### ***Contextualising the Project Area***

A brief overview of pre-historical and historical information is provided below in order to contextualise the region and to help to determine the significance of any heritage resources that may occur in the Project Area. The information is taken from the report done for the Pilanesberg Platinum Mine - Pistorius , 2013.

### **Stone Age sites**

Stone Age (SA) sites are marked by stone artifacts that are found scattered on the surface of the earth or that are part of deposits in caves and rock shelters. The Stone Age is divided into the Early Stone Age (ESA, the period from 2.5 million years ago to 250 000 years ago), the Middle Stone Age (MSA, the period from 250 000 years ago to 22 000 years ago) and the Late Stone Age (LSA, the period from 22 000 years ago to about 2 000 years ago).

A few isolated, haphazardly scattered stone tools were observed north of the proposed site. These tools date from the MSA and were not geo-referenced as they were possibly carried into the area.

The LSA is associated with rock paintings and engravings done by the San, Khoi Khoi and, in more recent times, by Negroid (Iron Age) farmers. It was communicated previously that there are caves higher up the mountain of Matone. Such phenomena, if they do exist, may contain stone tools dating from the SA, Late Iron Age remains and even rock paintings. A few rock paintings have been recorded in the Pilanesberg.

### **Late Iron Age remains**

The Pilanesberg area is dominated by stone walled sites that date from the Late Iron Age (LIA), some of which were occupied into the historical period. These sites are associated with Tswana groups such as the Kgatla Kgafêla, the Tlhako, the Tlôkwa and Nguni-affiliated clans who were either living in the area from an earlier time, before the Sotho-Tswana arrived, or who were descended from

Mzilikazi's Ndebele who temporarily occupied several settlement complexes in the area before they moved to the Zeerust-Marico area in AD1832. Large numbers of the descendants of these original Nguni-speaking people today live in Groenfontein, Rhenosterhoek and Kraalhoek, to the north of the PPM Project Area.

The following contextual evidence serves as background to the proposed prospecting site: the origins of the Kgatla group; the history of the Kgatla Kgafêla and the Tlhako; the arrival of the first colonists and early chrome mining in the area.

### *Origins of the Kgatla group*

The ancestral Kgatla were composed of the Kgatla, the Tlôkwa, the Makgolokwe and probably the Bahlakwana and the Basia sections. (The latter three clans no longer exist). The Kgatla also maintained that there was an early relationship with the Hurutshe (under common chiefs such as Malekele-Masilo-Legabo) which may date back to AD1450 when the Hurutshe and Kwenya separated. These earliest Kgatla groups initially lived in the central part of the former Transvaal province, somewhat to the south of what is today Thabazimbi, near the Rooiberg Tin Mines.

Phohoti, the son of Mokgatle, is usually regarded as the first Kgatla chief. His son and successor was Botlholo (Mashiasebara), whose sons Mogale, Pule and Modise split up. Pule initially ruled on behalf of Mogale's son Mosetlha, who died before he could succeed, and this encouraged Pule (whose son Masego died before his father) to leave the tribe and to form a separate tribe under his grandson Kgafele. Botlholo's third son, Modise, and his son Tabane were the forefathers of the sections of the Mmakau, the Motša and the Seabe.

Today there are numerous subsections of the Kgatla. In 1953 a leading anthropologist distinguished at least eleven tribes within this group.

The totem of the Kgatla is the blue monkey (kgabo), although they also had another totem, the 'kgabo ya mollo', or the 'tip of the flame', which they used when the Kgatla were on the warpath.

Mogale, the ancestor of the Mosetlha, lived at a place called Dirolong/Direleng in the Bela Bela area (some say in the Rustenburg area). Mogale (Mosetlha) or Mashego (Kgafela) moved to Momuseng (the old Makapans Location). Towards the end of the 17th century, the Kgafela section broke away under Mahego (the son of the regent, Pule). However, Kgafela and his son Tebele remained east of the Crocodile River and Kgafela's grandson Masellane moved to Molokwane ('Vlieggepoort') near the confluence of the Crocodile and Pienaars Rivers. (This split was the result of a dispute whether

Mosetlha, a woman, should rule the tribe). This was also the time when Tabane (the Mmakau section) broke away and settled at Mogwete (Varkfontein, in the Premier Mining area).

While the Kgatla Mosetlha remained one section, Tabane's branch later broke up into several tribes. Modise or Moptsha had a young wife who left the tribe while she was pregnant, as she was accused of witchcraft, saying that her child was crying in her womb. It was called 'lelela teng' ('crying inside'). This child later became the great Pedi chief Thulare, who was also called 'Thulare a Mmakau'. Further divisions of the Kgatla were caused by internal strife during the time of Mzilikazi (Breutz 1954, 1986; Schapera 1942, 1952, 1955).

#### *Brief history of the Kgatla Kgafêla*

After the Kgafêla broke away from the Mosetlha at Momusweng (Makapans Location, Hammanskraal), probably during the first half of the 17th century, they settled in various places on their way to the north-west and the Crocodile River.

Known places of settlement were Ntuane (to the north-west of Makapans Location near the Pienaars River), Momoseu (near Ntwane), and Tshekane (Leeuwpoot, south of the Rooiberg Tin Mine). Tshekane proved to be unhealthy, so they dwelt at Matone (Tuschenkomst) for a while and then settled at Molokwane ('Vlieggepoort', at the confluence of the Crocodile and Pienaars Rivers) near Ramakokas Location.

At the start of the 18th century, they lived at Mabule, Kruidfontein (near Saulspoort). During the first half of the 18th century, Kgwefane lived at Saulspoort in the Dithubaruba section of Moruleng. Molefe lived at Maramapong at Saulspoort.

Towards the end of the 18th century, Phetso lived at Sefikile (Spitskop, 8km to the west of Northam). Letsebe ruled at Mabule (Kruidfonten) at the confluence of the Modderkuil and Middelkuil. When Senwelo was invested as chief, he moved from Mabule to Tlokwane (Rhenosterkop). Motlotle ruled at Magakwe or Dithubarubu (Kruidfontein).

Pilane built his village at Monamaneng (Kafferskraal). Later he moved to Bogopana (Witfonteinrand), to the north-east of Witfontein, and from there to Mmamodimokwana (Schilpadsnest) near the Crocodile River.

After the Matabele invasion in AD1827 Pilane went to live at Motsitle (Mabeskraal). After AD1837 he settled at the Elands River at Mmasebudule (Rhenosterfontein).

During the Matabele invasion, the Kgatla were too weak to defend them against enemies. Consequently, they paid a tribute to the Ndebele. Nevertheless, their villages were destroyed and the young men were incorporated into the Ndebele army. After the Ndebele had left the Pilanesberg area (AD1832) Ndebele raiders returned to the area and took three of Pilane's sons with them in AD1842. Molefi Pilane's uncle negotiated their release. Molefi, who maintained good relations with the Ndebele took charge of the tribe when Pilane fled to the Langa Ndebele.

The far northern part of Kgatla territory, incorporating the farms Holfontein, Cyferfontein and Rhenosterkraal was a separate tribal section for some years under the authority of a sub-chief, Dikema Pilane. He played an important role in the times of Paul Kruger. It was also in this far northerly area that the descendants of one of Mzilikazi's sons lived.

Kgamanyana lived at Moruleng the present tribal headquarters at Saulspoort. In 1869 Kgamanyana and many tribesmen left the country to settle at Mochudi on the banks of the Nkgotwane River in Botswana, after camping one year at Tshwene-Tshwene (near Vleesfontein). The other part of the tribe remained at Saulspoort and acquired most of the farms to the north of the Pilanesberg.

Many of these Tswana clans were uprooted during the difaqane when Mzilikazi's Matabele (Ndebele) entered the North-West Province, crossing the Magaliesberg at Mpame (Kommandonek) in the middle of August 1832 (Breutz 1954, 1986; Schapera 1942, 1952, 1955).

#### *Brief history of the Tlhako*

The Tlhako is one of the numerous Nguni-related clans who lived in the central part of the former Transvaal province from early on. They branched off from the Ndzundza-Ndebele who lived near what is today the Premier Mine (Cullinan, Mangolwana) and Wonderboom (Pretoria). Thereafter they dwelt in the Boshhoek (Pharami) area for some time, before settling along the Thulani River near Pella towards the end of the 17th century.

Chief Seutlwane settled on the northern slope of Pilwe Mountain. His son, Mabe, who lived about the middle of the 18th century, moved six kilometres further to the north to Mothoutlung on the eastern part of Palmietfontein. Mabe's youngest son, Motsisi, went to live at Legatalle, to the north-east of Ruighoek 426, where he became involved with a long struggle with the Kgatla Kgafêla. His son, Molotsi, also lived and died at Legatalle, probably around AD1820 to AD1830.

Mabe became chief in 1820 and settled at Motsitle, today known as Mabieskraal. When Mzilikazi invaded the region, the Tlhako did not leave the area, but were subjugated by the Ndebele. Many of the Tlhako later accompanied the Ndebele and crossed the Marico River to settle with the Ndebele

at Silkaatskop. However, when the Ndebele were defeated by the Voortrekkers in the far North-Western Transvaal, many returned to their old home at Motsitle in 1837.

Maabe and the Voortrekkers' relationship deteriorated. After he was flogged by the Boers in AD1860, the tribe moved to Molepolole and settled at Magagarape, where Maabe died in 1869. His sons Moetle, Mokgatele, Leotwane and Setadi returned to Mableskraal.

Moetle Mabe became chief in 1870. He raided the cattle of the local white farmers and also supplied labour to surrounding white farmers. He died on 15 May 1908. Stone walled sites identified on Ruighoek 169JP located to the east of the site can therefore possibly be associated with this group (Breutz 1954, 1986).

#### *Arrival of the first colonists*

During the first half of the 19th century, the first colonial traders who operated between the far north-west and the central part of the Bankeveld used the gap between the northern tip of the Magaliesberg and the south-western edges of the Pilanesberg, near the proposed site as a corridor. Wagons passed through this corridor on their way to Rustenburg and further to the east. Traders such as Schoon and McLuckie (1829), missionaries such as Robert Moffat (1829), the scientific expedition of Andrew Smith (1835) (Lye 1975), and adventurers such as Cornwallis Harris (1836) moved between the Magaliesberg and the Pilanesberg where they observed numerous Late Iron Age communities living in this part of the north-west (Horn 1996).

Rustenburg, 57km southeast of the site, was the first colonial town to be established by Europeans (Voortrekkers) during the first half of the 19th century (Pretorius 1967). Closer to Pilanesberg, Boshhoek was established along the railway line from Pretoria, and the town initially served as a terminus (Erasmus 1995).

#### *Early chrome mining*

It has long been known that there were chrome ores in the Bushveld Igneous Complex. They were indicated on Carl Mauch's geological map of the area close to the Hex River near Rustenburg, which he visited in 1865. Chromite is also mentioned in official reports that were compiled by a certain Molengraaf. The first exploration for chrome occurred in 1917 and general production of the metal began in 1924 when 4 570 tons were mined.

Chromite is present in the Bushveld Igneous Complex as layers in the pyroxinite, norite and anorthosite units and to a certain extent also in the harzburgite unit. The deposits in the Complex can be divided into a Western Zone and an Eastern Zone.

The deposits in the Western Zone stretch for approximately 200km from Brits to Rustenburg, further northwards to the west of the Pilanesberg, and from there, with some interruptions of seven to thirteen kilometres, to near the Crocodile River. The Eastern Complex starts near Draaikraal at the upper reaches of the Dwars River in the Lydenburg district. Further northwards the deposit crosses the Steelpoort River near the Steelpoort station and gradually turns north-westwards as far as Scheiding – a total distance of 120 kilometres.

The Western Zone can be divided into four sections, namely a sector to the north of Rustenburg, two sectors to the west and to the north of the Pilanesberg, and a sector in the Brits-Rustenburg area.

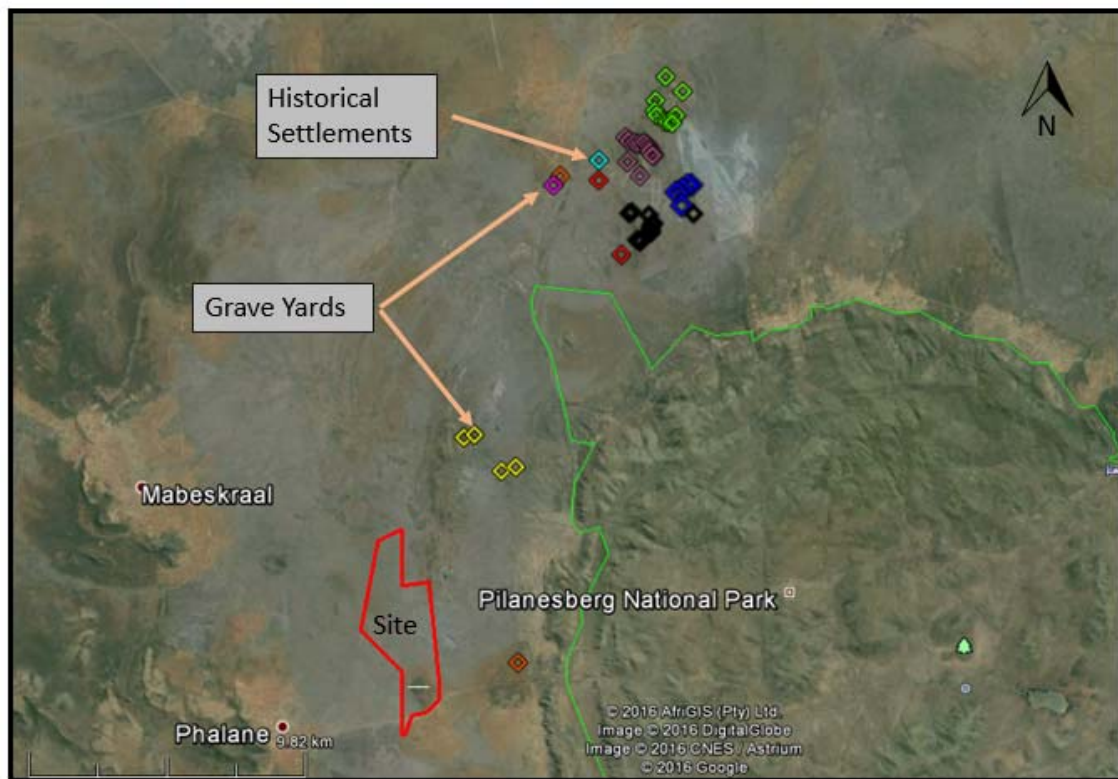
The sector to the west of the Pilanesberg seems to have been exploited the most. Here two distinct layers were distinguished, namely the Groenfontein layer and the Main Layer higher up in the sequence. These layers vary in thickness on farms such as Palmietfontein 208JP, Groenfontein 138JP and Ruighoek 169JP.

By the start of 1974 seventeen chrome mines were already operating: eight in the Western Zone, six in the Eastern Zone, two in Marico and one near Mokopane (Viljoen & Reimold 1999; Wagner 1973).

The map below present the heritage sites identified in the project area. Most of the sites indicate where late Iron Age sites were identified, unless otherwise indicated on the map. It is doubtful if any heritage sites will be present on the southern section of the proposed prospecting site due to the intensive agricultural practices. Late Iron Age sites, possibly graves and historical settlements may still be found on the natural areas



**Figure 32: Heritage Sites identified in the vicinity of the site**



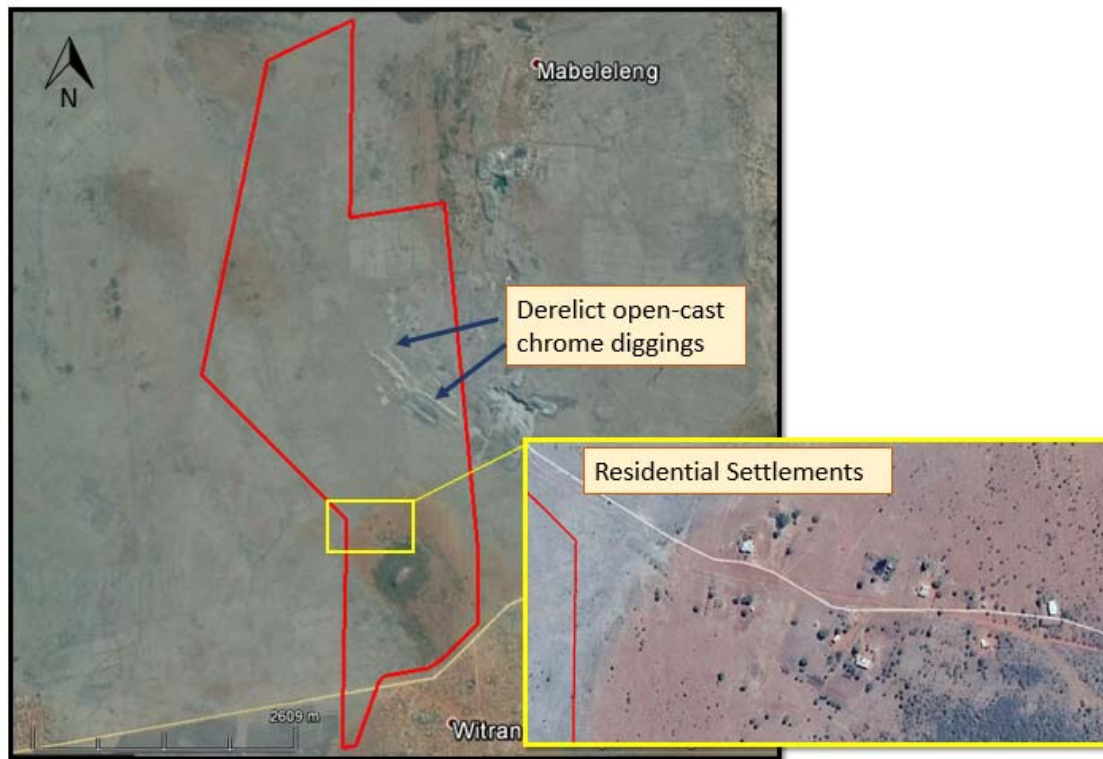
Interested or affected parties are welcome to submit any additional information on any potential aspects that may be of cultural or historic significance.

#### **(b) Description of the current land uses.**

##### **8.14 LAND USE**

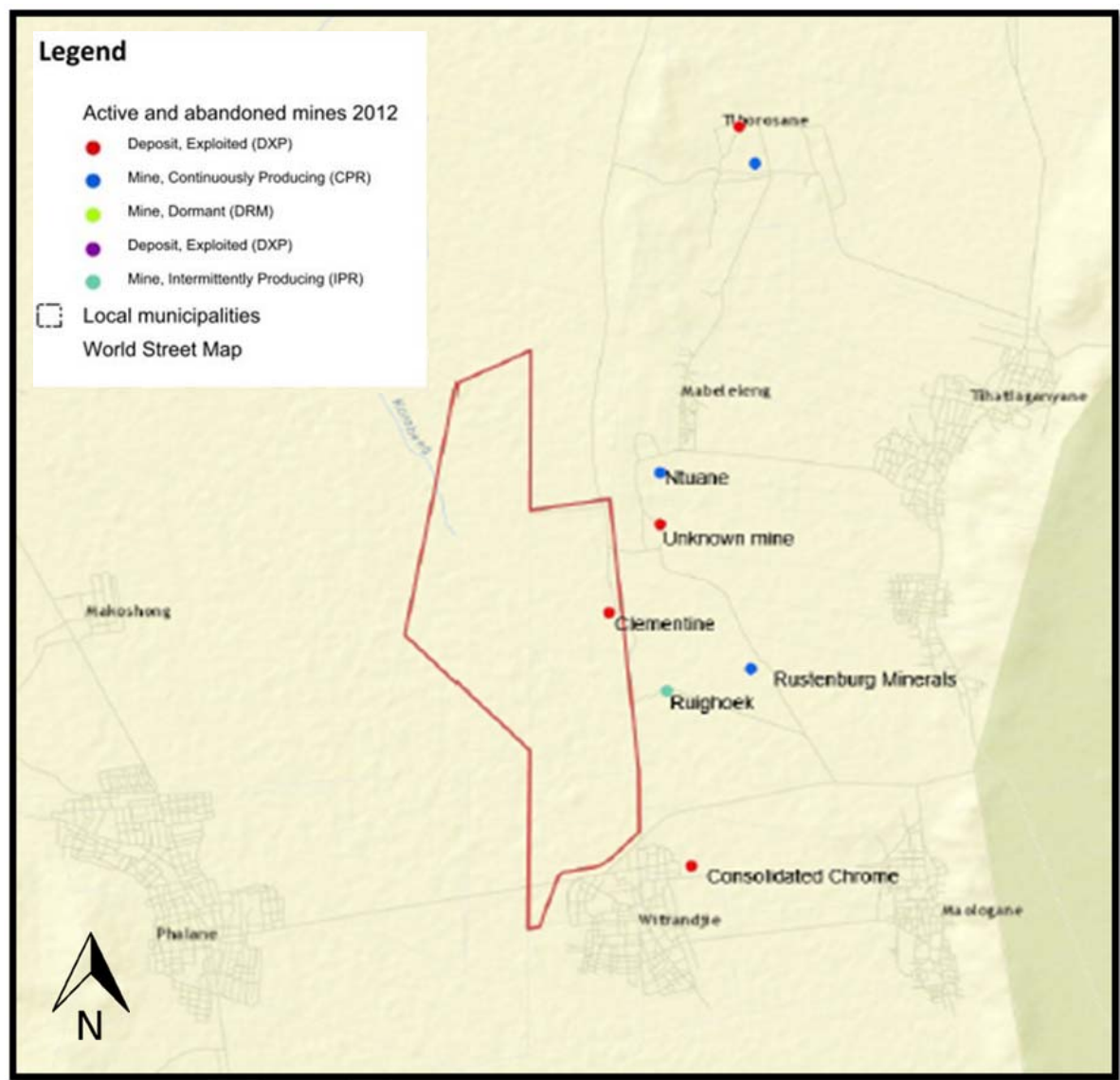
The area south of the dirt road that crosses the site is being used for agricultural purposes. Derelict open-cast chrome diggings occur on portions 8 and 9 of the farm Tweelagte 175 JP. The rest of the property is in a near natural state (though is likely overgrazed).

**Figure 33: Land uses**



There are a number of active and abandoned mines in the vicinity of the site. Please see the figure below.

Figure 34: Active & Abandoned Mines



**Figure 35: Evidence of derelict diggings on site**



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

***Environmental features***

A small hill with a highest point at an altitude of 1174 m above ground level is present to the centre of the site at the eastern boundary.

The Sandspruit River, a tributary of the Eland River, is present on the southern part of the site.

**Figure 36: Dirt road connecting Witrandjie and Phalane**





## Infrastructure

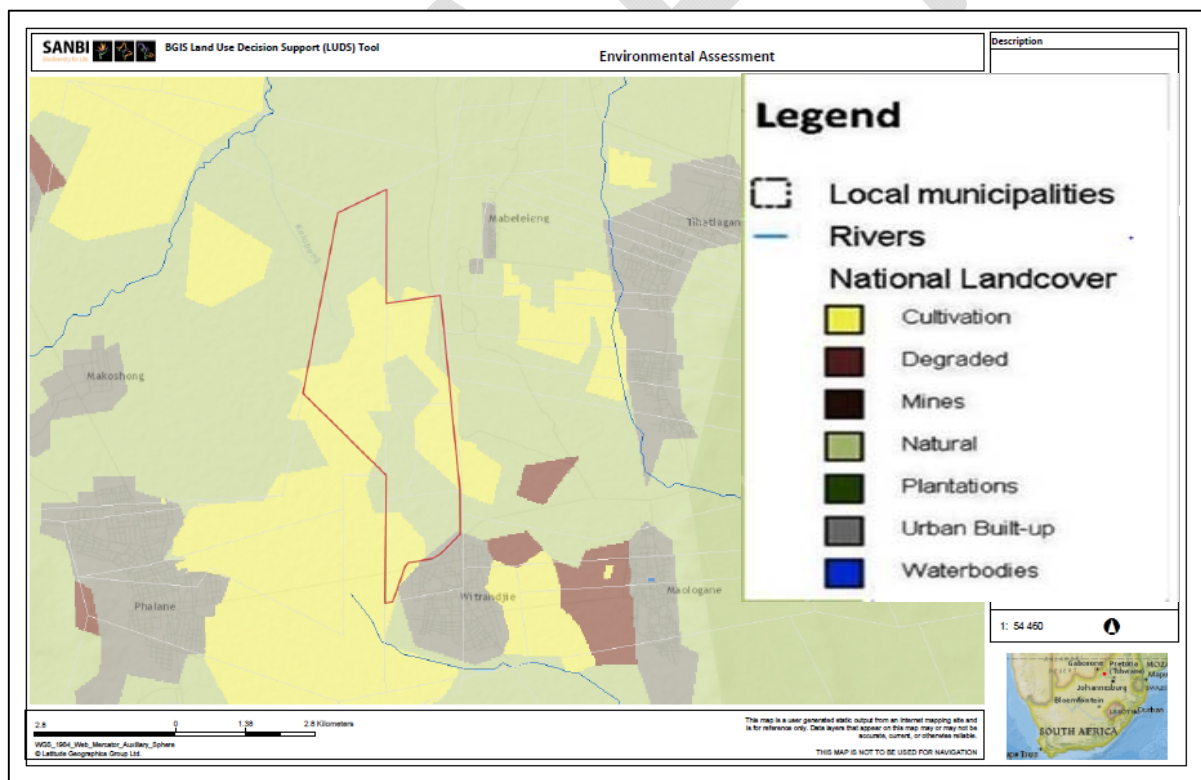
There is a dirt road that crosses the property. The dirt road connects the rural settlement of Witrandjie and Phalane which is located to the eastern and western ends of the site respectively.

There is a high voltage (HV) overhead transmission line that crosses the property in a north-south direction. It crosses a medium voltage (MV) transmission line that distributes power to the rural settlements around the property.

### (d) Environmental and current land use map.(Show all environmental, and current land use features)

60% of the proposed site have been classified as Cultivated (yellow on map). Natural land (green) and Urban Built-up Areas (grey) covers approximately 18% each and Degraded land (brown) covering about 2% of the area.

Figure 37: Landcover Map



## 9 IMPACT ASSESSMENT

- v) **Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts** (Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such

activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

## 9.1 IMPACT ASSESSMENT

The impact Assessment is presented in the table below.

**Table 5: Impact Assessment Table**

| ACTIVITIES  | POTENTIAL IMPACT  | Extent of impact | Duration of impact | Intensity of impact | Probability of occurrence of impact | SIGNIFICANCE if not mitigated |
|---|---|------------------|--------------------|---------------------|-------------------------------------|-------------------------------|
| Vegetation clearance for establishment of drill sites   | Removal of / damage to natural vegetation   | 2                | 2                  | 1                   | 4                                   | 16                            |
| Vegetation clearance for establishment of drill sites   | The stripping of soil, incorrect stockpiling, erosion and storm water run-off can lead to the loss of topsoil | 1                | 3                  | 3                   | 2                                   | 18                            |
| Vegetation clearance for establishment of drill sites   | Changes to the shape or form of the land  | 1                | 1                  | 1                   | 2                                   | 2                             |
| Vegetation clearance for establishment of drill sites   | Impact on current land use  | 1                | 1                  | 3                   | 2                                   | 6                             |
| Vegetation clearance, Site establishment , Drilling activities & movement of people and equipment on site | Destruction of cultural heritage sites and artifacts  | 3                | 5                  | 3                   | 1                                   | 45                            |
| Vegetation clearance for establishment of drill site  | Damage to sensitive biodiversity areas (hill)   | 3                | 3                  | 3                   | 2                                   | 54                            |
| Vegetation clearance for establishment of drill sites   | Dust pollution  | 2                | 1                  | 3                   | 4                                   | 24                            |
| Vegetation clearance for establishment of drill sites   | Storm water run-off from cleared areas could lead to siltation of surface water                               | 2                | 2                  | 3                   | 2                                   | 24                            |
| Vegetation clearance for establishment of drill sites   | Disturbance of farming / tourism activities   | 1                | 1                  | 3                   | 2                                   | 6                             |
| Workers & material on site  | Contamination of soils through spills from sanitation facilities & litter                                     | 1                | 1                  | 2                   | 4                                   | 8                             |
| Workers & material on site  | Poaching  | 1                | 3                  | 3                   | 3                                   | 27                            |

| ACTIVITIES   | POTENTIAL IMPACT   | Extent of impact | Duration of impact | Intensity of impact | Probability of occurrence of impact | SIGNIFICANCE if not mitigated |
|--|--|------------------|--------------------|---------------------|-------------------------------------|-------------------------------|
| Workers & material on site                             | Fire   | 2                | 3                  | 3                   | 3                                   | 54                            |
| Workers & material on site                             | Collection of fire wood, damage to property  | 2                | 2                  | 3                   | 2                                   | 24                            |
| Workers & material on site                             | Contribution to the economy through employment   | 2                | 1                  | 3                   | 4                                   | 24 POSITIVE                   |
| Workers & material on site                             | Spread of HIV/Aids to farm workers and local community   | 2                | 4                  | 3                   | 2                                   | 48                            |
| Use of heavy machinery & vehicles on site for drilling | Resource consumption (diesel - non-renewable resource)   | 2                | 3                  | 2                   | 2                                   | 24                            |
| Use of heavy machinery & vehicles on site for drilling | Contamination of soils through hydrocarbon leaks and spills from machinery & equipment         | 1                | 2                  | 3                   | 3                                   | 18                            |
| Use of heavy machinery & vehicles on site for drilling | Use of groundwater for drilling activities   | 2                | 1                  | 3                   | 3                                   | 18                            |
| Use of heavy machinery & vehicles on site for drilling | Contamination of surface water through hydrocarbon leaks and spills from machinery & equipment | 2                | 3                  | 3                   | 2                                   | 36                            |
| Use of heavy machinery & vehicles on site for drilling | Contamination of groundwater through hydrocarbon leaks and spills from machinery & equipment   | 2                | 3                  | 3                   | 1                                   | 18                            |
| Use of heavy machinery & vehicles on site for drilling | Compaction of soils through movement of heavy vehicles and machinery on site                   | 1                | 1                  | 2                   | 4                                   | 8                             |
| Use of heavy machinery & vehicles on site for drilling | Damage to vegetation   | 1                | 2                  | 3                   | 4                                   | 24                            |
| Use of heavy machinery & vehicles on site for drilling | Release of gaseous emissions   | 2                | 2                  | 3                   | 3                                   | 36                            |



| ACTIVITIES   | POTENTIAL IMPACT  | Extent of impact | Duration of impact | Intensity of impact | Probability of occurrence of impact | SIGNIFICANCE if not mitigated |
|--|---|------------------|--------------------|---------------------|-------------------------------------|-------------------------------|
| Use of heavy machinery & vehicles on site for drilling | Dust Fallout  | 2                | 1                  | 3                   | 4                                   | 24                            |
| Use of heavy machinery & vehicles on site for drilling | Increase in ambient noise levels  | 2                | 1                  | 3                   | 4                                   | 24                            |
| Use of heavy machinery & vehicles on site for drilling | Visual intrusion  | 1                | 1                  | 2                   | 4                                   | 8                             |
| Use of heavy machinery & vehicles on site for drilling | Disturbance of fauna species in the vicinity  | 2                | 2                  | 3                   | 4                                   | 48                            |
| Use of heavy machinery & vehicles on site for drilling | Release of methane gas from exploration boreholes   | 2                | 2                  | 2                   | 4                                   | 32                            |
| Use of heavy machinery & vehicles on site for drilling | Cross-contamination of aquifers due to borehole construction  | 3                | 3                  | 4                   | 2                                   | 72                            |
| Use of heavy machinery & vehicles on site for drilling | Proliferation of invasive plant species   | 1                | 3                  | 3                   | 4                                   | 36                            |
| <b>Closure</b>   |   |                  |                    |                     |                                     |                               |
| Concurrent rehabilitation                              | Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion | 1                | 4                  | 1                   | 4                                   | 16 POSITIVE                   |
| Concurrent rehabilitation                              | Use stockpiled top soil to close sumps and test pits  | 1                | 5                  | 3                   | 4                                   | 60 POSITIVE                   |
| Close drill hole                                       | Restoration of land use and land capability   | 1                | 3                  | 2                   | 3                                   | 18 POSITIVE                   |

## 9.2 IMPACT ASSESSMENT METHODOLOGY

- vi) **Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;** (Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

All activities associated with the different phases of the project (construction, operation and decommissioning) were listed and assessed to determine potential impacts.

In order to determine the significance of an activity each activity was rated. The following parameters were used:

**Extent of impact (E)**

1 = Site specific - Extending only as far as the activity, or limited to the site and its immediate surroundings

2 = Regional - Will have an impact on the region. A development can often have a regional impact on Biodiversity. Example: if a feeding site for birds or mammals is destroyed, the population might leave the area or go extinct if they don't find other suitable areas.

3 = National - Will have an impact on a national scale - particularly if an ecosystem or species of national significance is affected

4 = International - Will have an impact across international borders or will impact on an ecosystem or species of international significance

**Duration of impact (D)**

1 = Short term (0-5 years)

2 = Medium term (5-15 years)

3 = Long term (16-30 years) - Impact will cease after the operational or working life of the activity, either due to natural process or by human intervention

4 = Discontinuous or intermittent - Impact may only occur during specific climatic conditions or during a particular time of year

5 = Permanent - Impact will be where mitigation or moderation by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient or temporary

**Intensity of impact (I)**

1 = Low Impact - Affects the environment in such a way that natural, cultural and soil functions and processes are not affected

2 = Medium Impact - Affected environment is altered by natural, cultural and soil functions and processes continue although in a modified way

3 = High Impact - Natural, cultural or social functions or processes are altered to the extent that they will temporarily or permanently cease

**Probability of impact occurring (P)**

1 = Improbable – Low likelihood

2 = Probable – Distinct possibility

3 = Highly probable – Most likely

4 = Definite - Impact will occur regardless of any prevention measures

**Criteria of assigning significance to potential impacts**

Significance is determined by means of the following calculation:

Extent of Impact X Duration of Impact X Intensity of Impact X Probability of Occurrence of Impact =  
**SIGNIFICANCE**

Significance determination criteria

| Extent of Impact |   | Duration of Impact |   |
|------------------|---|--------------------|---|
| Site Specific    | 1 | Short term         | 1 |
| Regional         | 2 | Medium term        | 2 |
| National         | 3 | Discontinuous      | 3 |
| International    | 4 | Long term          | 4 |
|                  |   | Permanent          | 5 |

| Intensity of Impact |   | Probability of Occurrence of Impact |   |
|---------------------|---|-------------------------------------|---|
| Low                 | 1 | Improbably (low likelihood)         | 1 |
| Medium              | 2 | Probable (Distinct possibility)     | 2 |
| High                | 3 | Highly probable (Most likely)       | 3 |
|                     |   | Definite                            | 4 |

**SIGNIFICANCE**

|        |                 |
|--------|-----------------|
| High   | <b>73 - 240</b> |
| Medium | <b>36 - 72</b>  |
| Low    | <b>1- 35</b>    |

- vii) **The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.** (Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

Positive Impact associated with the proposed Prospecting:

- Employment contributing to the economy
- Concurrent rehabilitation during prospecting

Negative Impacts associated with the proposed prospecting

- Loss of soil resources
- Use of vehicles onsite – compaction
- Change of current land use
- Removal / damage of natural vegetation
- Destruction of cultural heritage sites and artefacts
- Damage to sensitive biodiversity areas (small hill)
- Disturbance of riparian habitats & non-perennial river
- Contamination of surface water
- Contamination of soils
- Litter

### 9.3 MITIGATION MEASURES

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

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the 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).

Mitigation measures were identified for all possible impacts even though no impact was considered to be of high significance

**Table 6: Impact and Mitigation Table**

| ACTIVITIES  | POTENTIAL IMPACT  | MITIGATION MEASURES  |
|---|---|--|
| Vegetation clearance for establishment of drill sites | Removal of / damage to natural vegetation   | 1) Boreholes and access tracks will be located in areas that will result in minimal ground disturbance.<br>2) Permission will be obtained from landowners before trees are felled.<br>3) 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.<br>4) Vegetation clearance will be limited to 0.01 ha per drill hole |
| Vegetation clearance for establishment of drill sites | The stripping of soil, incorrect stockpiling, erosion and storm water run-off can lead to the loss of topsoil | 1) Topsoil will be stripped to a depth of 250 mm from all disturbed areas and stored outside the 1:50 year flood levels of rivers and streams, within the firebreak area.<br>2) Topsoil will be adequately protected from being blown away or being eroded.<br>3) Boreholes and access tracks will be located in areas that will result in minimal ground disturbance.   |
| Vegetation clearance for establishment of drill sites | Changes to the shape or form of the land  | 1) During the planning phase for each borehole, specific controls will be identified and implemented, based on site conditions.  |

| ACTIVITIES  | POTENTIAL IMPACT  | MITIGATION MEASURES   |
|---|---|---|
| Vegetation clearance for establishment of drill sites   | Impact on current land use  | <ol style="list-style-type: none"> <li>1) Land disturbed will be rehabilitated to a stable and permanent form suitable for subsequent land use.</li> <li>2) Exact location of drill holes, test pits and new access routes will be determined through communication with land owner</li> </ol>  |
| Vegetation clearance, Site establishment , Drilling activities & movement of people and equipment on site | Destruction of cultural heritage sites and artifacts                            | <ol style="list-style-type: none"> <li>1) Potential heritage sites will be identified during the planning phase to ensure that such areas are avoided. Each prospecting site will be visited prior to any work starting to identify possible heritage sites.</li> <li>2) Local knowledge will be used to identify and confirm heritage sites.</li> <li>3) Prospecting activities will be kept away from excluded and exempted areas.</li> <li>4) Where boreholes are sited in proximity to heritage sites and depending on the proximity to the drilling site, appropriate measures such as flagging, pegging or installation of temporary fencing will be undertaken to ensure that the site is not impacted on during prospecting.</li> </ol> |
| Vegetation clearance for establishment of drill site  | Damage to sensitive biodiversity areas (small hill)                             | <ol style="list-style-type: none"> <li>1) A field survey will be undertaken before drilling commences at each drilling site to confirm that no ecologically sensitive areas or conservation areas are present in sections to be cleared.</li> <li>2) Areas of ecological significance will be avoided and if disturbance is required, it will be undertaken in accordance with legislation.</li> </ol>  |
| Vegetation clearance for establishment of drill sites   | Dust pollution  | <ol style="list-style-type: none"> <li>1) Dust will be effectively controlled in all areas cleared from vegetation through water spraying.</li> </ol>   |
| Vegetation clearance for establishment of drill sites   | Storm water run-off from cleared areas could lead to siltation of surface water | <ol style="list-style-type: none"> <li>1) Controls will be aimed at minimising erosion and sediment washing from drill pads, access roads and other disturbed areas.</li> <li>2) Sediment and erosion controls will be designed to prevent runoff from the prospecting site into rivers &amp; streams.</li> <li>3) Sediment and erosion controls may include cut-off trenches and drains, culverts for tracks, silt fences, straw bales, rock armouring or mulching.</li> </ol>   |
| Vegetation clearance for establishment of drill sites   | Disturbance of farming / tourism activities                                     | <ol style="list-style-type: none"> <li>1) Prospecting activities will be discussed with landowners prior to work commencing.</li> <li>2) Drill holes and access routes not wanted by land owners on completion of prospecting activities will be rehabilitated</li> </ol>   |
| Workers & material on site  | Contamination of soils through spills from sanitation facilities & litter       | <ol style="list-style-type: none"> <li>1) A chemical toilet will be used on site during prospecting and will be used in such a way as to prevent water pollution. The use of a chemical toilet will be undertaken in consultation with the landowner.</li> <li>2) Full or leaking toilets must be reported to the Supervisor for corrective action or replacement.</li> <li>3) Prospecting areas will be maintained in a clean and tidy condition at all times.</li> <li>4) All waste will be collected, separated and stored in properly constructed containers with lids and removed to an approved landfill or another site according to local municipal requirements.</li> </ol>  |

| ACTIVITIES   | POTENTIAL IMPACT   | MITIGATION MEASURES  |
|--|--|--|
|  |  | 5) Full waste bins must be reported to the Supervisor for collection and disposal at an approved landfill.   |
| Workers & material on site                             | Poaching   | 1) No employees will be permitted to stay on the site.<br>2) Hunting / poaching will not be allowed.<br>3) Only one drill site at any given time. All employees present at the one drill site with appropriate supervision   |
| Workers & material on site                             | Fire   | 1) Vegetation around each exploration site within a 5m radius will be kept short to create a fire management zone.<br>2) Collection of firewood will not be allowed.<br>3) Open fires will be prohibited to people involved in prospecting.<br>4) No burning cigarettes or matches may be thrown down within the prospecting area. A bucket with sand will be provided for the disposal of cigarettes and matches.<br>5) No smoking will be allowed near gas, paints or fuel storage areas.<br>6) Suitable welding blankets are to be used when welding or operating grinders and this equipment is to be serviced regularly.<br>7) Rubbish or vegetation may under no circumstances be burnt. All waste will be removed off site and disposed of at an approved landfill. |
| Workers & material on site                             | Collection of fire wood, damage to property  | 1) Collection of firewood will not be allowed.<br>2) Only one drill site at any given time. All employees present at the one drill site with appropriate supervision<br>3) Complaints and outcomes of subsequent investigations will be recorded in a Complaints Register in the format of a spreadsheet.<br>4) If damage to private property occurs as a result of prospecting activities, such damage will be repaired or owners will be compensated as appropriate.   |
| Workers & material on site                             | Contribution to the economy through employment   | 1) Due to the nature of prospecting, employment opportunities will be minimal. The prospecting crew is small ( 5 people) with specialised skills. Were possible, local people will however be employed during the project.<br>2) Local people and businesses with appropriate skills will be identified and included in the project tender process. The applicant is committed to employ local people and businesses during the project, where possible.   |
| Workers & material on site                             | Spread of HIV/Aids to farm workers and local community                                 | 1) Due to the nature of prospecting, employment opportunities will be minimal. The prospecting crew is small ( 5 people) with specialised skills. Were possible, local people will however be employed during the project.<br>2) No employees will be permitted to stay on site.<br>3) Aids awareness talks  |
| Use of heavy machinery & vehicles on site for drilling | Resource consumption (diesel - non-renewable resource)                                 | 1) Vehicles and equipment to be serviced regularly and maintained in good working condition  |
| Use of heavy machinery & vehicles on site for drilling | Contamination of soils through hydrocarbon leaks and spills from machinery & equipment | 1) All chemicals, fuels and oils to be stored on site will be appropriately banded.<br>2) Precautions will be taken to prevent spills and soil contamination.<br>3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up  |

| ACTIVITIES   | POTENTIAL IMPACT   | MITIGATION MEASURES  |
|--|--|--|
|  |  | requirements to ensure correct clean-up procedure.<br>4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site.   |
| Use of heavy machinery & vehicles on site for drilling | Use of groundwater for drilling activities   | 1) Existing water supply locations will be identified for use and agreements will be reached with landowners regarding on-site water use. The drilling rig will require approximately 1,000l/day. Where a suitable water supply is not available, water will be sourced from a commercial supplier and delivered to site by water tanker.<br>2) If required, a water use license will be applied for to DWS for the abstraction of surface- and/or groundwater during prospecting.<br>3) Adequate provision will be made for storing drinking water on site in the form of 2500 litre plastic water tanks. |
| Use of heavy machinery & vehicles on site for drilling | Contamination of surface water through hydrocarbon leaks and spills from machinery & equipment | 1) The drilling fluid that will be used during prospecting must be biodegradable and not pose a water pollution threat.<br>2) Drilling sumps and containment measures will be designed to contain all drilling fluid.<br>3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements to ensure correct clean-up procedure.<br>4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site.<br>5) Drill sites to be located 60 m from rivers & stream.                                    |
| Use of heavy machinery & vehicles on site for drilling | Contamination of groundwater through hydrocarbon leaks and spills from machinery & equipment   | 1) Machinery and equipment will only be maintained over a drip tray, a thin concrete slab or a PVC lining to prevent soil and water contamination.<br>2) No vehicle will be extensively repaired on site.<br>3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements to ensure correct clean-up procedure.<br>4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site.   |
| Use of heavy machinery & vehicles on site for drilling | Compaction of soils through movement of heavy vehicles and machinery on site                   | 1) Stay on predefined areas and routes.<br>2) Scarify access roads and stockpile areas to a depth of 500 mm and restore topsoil cover.<br>3) Re-seed or plant vegetation indigenous to the area.   |
| Use of heavy machinery & vehicles on site for drilling | Damage to vegetation   | 1) Vehicles will only stay on dedicated roads (turning circles).<br>2) No movement of heavy machinery outside dedicated routes.<br>3) All routes and turning circles will be scarified and re-seeded with seeds from vegetation indigenous to the area.  |
| Use of heavy machinery & vehicles on site for drilling | Release of gaseous emissions   | 1) Vehicles and equipment will be maintained in a good working order.  |
| Use of heavy machinery & vehicles on site for drilling | Dust Fallout   | 1) Speed limits on gravel roads will be 40 km/hr to minimise dust and noise generation.<br>2) Dust will be effectively controlled in all disturbed areas   |

| ACTIVITIES   | POTENTIAL IMPACT  | MITIGATION MEASURES   |
|--|---|---|
|  |   | through water spraying.   |
| Use of heavy machinery & vehicles on site for drilling | Increase in ambient noise levels  | 1) Speed limits on gravel roads will be 40 km/hr to minimise dust and noise generation.<br>2) Prospecting activities will be restricted to day light hours.   |
| Use of heavy machinery & vehicles on site for drilling | Visual intrusion  | 1) Only one site to be drilled at any one time<br>2) Concurrent rehabilitation  |
| Use of heavy machinery & vehicles on site for drilling | Disturbance of fauna species in the vicinity  | 1) Prospecting activities will be kept away from excluded and exempted areas.<br>2) A field survey will be undertaken before drilling commences at each drilling site to confirm that no threatened species, ecologically sensitive areas or conservation areas are present in sections to be cleared.<br>3) Areas of ecological significance will be avoided and if disturbance is required, it will be undertaken in accordance with legislation.<br>4) One site to be drilled at a time.<br>5) Concurrent rehabilitation.                              |
| Use of heavy machinery & vehicles on site for drilling | Release of methane gas from exploration boreholes   | 1) Exploration boreholes are to be capped when no drilling work is being undertaken.<br>2) Exploration boreholes which will not be used during production to be sealed with cement once exploration work has been completed.  |
| Use of heavy machinery & vehicles on site for drilling | Cross-contamination of aquifers due to borehole construction  | 1) For the purpose of future monitoring programmes, impact assessments and concurrent rehabilitation, the depth of water strikes will be recorded during exploration drilling.<br>2) The static groundwater level will be monitored in prospecting boreholes that intersected water after completion and before concurrent rehabilitation for future monitoring, impact assessment and concurrent rehabilitation purposes.<br>3) Any completed hole that is not required for groundwater monitoring, will be sealed to prevent groundwater contamination. |
| Use of heavy machinery & vehicles on site for drilling | Proliferation of invasive plant species   | 1) Machinery will be cleared of dust/mud and seed prior to relocation to the next site to prevent the spread of alien invasive species.   |
| <b>Closure</b>   |   |   |
| Concurrent rehabilitation                              | Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion | 1) 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.<br>2) Erosion and sediment controls as well as the disturbed area will be rehabilitated a<br>3) 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 as required.   |
| Concurrent rehabilitation                              | Use stockpiled top soil to close sumps and test pits  | 1) Scarify access roads and stockpile storage areas to a depth of 500 mm.<br>2) Restore topsoil cover.<br>3) Re-seed or plant vegetation indigenous to the area.  |



| ACTIVITIES       | POTENTIAL IMPACT                            | MITIGATION MEASURES  |
|------------------|---|--|
| Close drill hole | Restoration of land use and land capability | 1) Exploration boreholes are to be capped when no drilling work is being undertaken.<br>2) Exploration boreholes which will not be used during production to be sealed with cement once exploration work has been completed. |

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

Location Alternatives: This property provides the ideal geological formation for the presence of the minerals. The properties around here have already been applied for, for prospecting or mining of chrome. No other sites are available.

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

This is an application for prospecting. The 42 holes will be drilled at locations determined by the geology of the site. Drill holes will be located at least 60 m meters from any watercourse. No drilling will be allowed closer than 50m to the small hill.

**i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.** (Including (i) a description of all environmental issues and risks that are 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.)

Please refer to Tables 5 and 6.

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

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

| <b>NAME OF ACTIVITY</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>POTENTIAL IMPACT</b><br>(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b> | <b>PHASE</b><br>In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure) | <b>SIGNIFICANCE</b><br>if not mitigated | <b>MITIGATION TYPE</b><br>(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)<br>E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.. | <b>SIGNIFICANCE</b><br>if mitigated |
|--|---|-------------------------|---|---|---|-------------------------------------|
| Vegetation clearance for establishment of drill sites  | Removal of / damage to natural vegetation   | Vegetation              | Operational   | 16                                      | Control through limiting area   | Low                                 |
| Vegetation clearance for establishment of drill sites  | The stripping of soil, incorrect stockpiling, erosion and storm water   | Soils                   | Operational   | 18                                      | Control through storing of topsoil and protecting topsoil stockpiles  | Low                                 |

| <b>NAME OF ACTIVITY</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>POTENTIAL IMPACT</b><br>(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b>    | <b>PHASE</b><br>In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure) | <b>SIGNIFICANCE</b><br>if not mitigated | <b>MITIGATION TYPE</b><br>(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)<br>E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.. | <b>SIGNIFICANCE</b><br>if mitigated |
|--|---|----------------------------|---|---|---|-------------------------------------|
|  | run-off can lead to the loss of topsoil   |                            |   |   |   |                                     |
| Vegetation clearance for establishment of drill sites  | Changes to the shape or form of the land  | Topography                 | Operational   | 2                                       | Remedy through concurrent rehabilitation of drill sites & test pits   | Low                                 |
| Vegetation clearance for establishment of drill sites  | Impact on current land use  | Land Use & Land Capability | Operational   | 6                                       | Control via communication with land owner   | Low                                 |
| Vegetation clearance, Site establishment , Drilling activities & movement of people and equipment on site  | Destruction of cultural heritage sites and artifacts  | Cultural Heritage          | Operational   | 45                                      | Stop through identification of sites and protecting   | Low                                 |
| Vegetation clearance for   | Damage to   | Sensitive                  | Operational   | 54                                      | Stop through  | Low                                 |

| <b>NAME OF ACTIVITY</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>POTENTIAL IMPACT</b><br>(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b> | <b>PHASE</b><br>In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure) | <b>SIGNIFICANCE</b><br>if not mitigated | <b>MITIGATION TYPE</b><br>(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)<br>E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.. | <b>SIGNIFICANCE</b><br>if mitigated |
|--|---|-------------------------|---|---|---|-------------------------------------|
| establishment of drill site  | sensitive biodiversity areas (small hill)   | Biodiversity Areas      |   |   | identification of areas and buffering of small hill (50 m)  |                                     |
| Vegetation clearance for establishment of drill sites  | Dust pollution  | Air Quality             | Operational   | 24                                      | Control through dust suppression  | Low                                 |
| Vegetation clearance for establishment of drill sites  | Storm water run-off from cleared areas could lead to siltation of surface water   | Surface Water           | Operational   | 24                                      | Control through implementation of sediment and erosion controls   | Low                                 |
| Vegetation clearance for establishment of drill  | Disturbance of farming /  | Social and Economic     | Operational   | 6                                       | Control via communication with land   | Low                                 |

| <b>NAME OF ACTIVITY</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>POTENTIAL IMPACT</b><br>(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b>       | <b>PHASE</b><br>In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure) | <b>SIGNIFICANCE</b><br>if not mitigated | <b>MITIGATION TYPE</b><br>(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)<br>E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.. | <b>SIGNIFICANCE</b><br>if mitigated |
|--|---|-------------------------------|---|---|---|-------------------------------------|
| sites  | tourism activities  | Environment                   |   |   | owner   |                                     |
| Workers & material on site   | Contamination of soils through spills from sanitation facilities & litter   | Soils                         | Operational   | 8                                       | Control through placement of facility and regular maintenance. Collection of waste  | Low                                 |
| Workers & material on site   | Poaching  | Fauna                         | Operational   | 27                                      | Control through supervision and operational hours on site   | Low                                 |
| Workers & material on site   | Fire  | Social and Economic & Ecology | Operational   | 54                                      | Avoid through Code of Conduct & Control through Fire Breaks   | Low                                 |

| <b>NAME OF ACTIVITY</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>POTENTIAL IMPACT</b><br>(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b>         | <b>PHASE</b><br>In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure) | <b>SIGNIFICANCE</b><br>if not mitigated | <b>MITIGATION TYPE</b><br>(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)<br>E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.. | <b>SIGNIFICANCE</b><br>if mitigated |
|--|---|---------------------------------|---|---|---|-------------------------------------|
|  |   | Environment                     |   |   |   |                                     |
| Workers & material on site   | Collection of fire wood, damage to property   | Vegetation                      | Operational   | 24                                      | Control through supervision and operational hours on site   | Low                                 |
| Workers & material on site   | Contribution to the economy through employment  | Social and Economic Environment | Operational   | 24                                      | Employment of local people and businesses where possible  | Positive impact                     |
| Workers & material on site   | Spread of HIV/Aids to farm workers and local community  | Social and Economic Environment | Operational   | 48                                      | Control through awareness   | Low                                 |

| NAME OF ACTIVITY<br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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.) | POTENTIAL IMPACT<br>(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | ASPECTS AFFECTED | PHASE<br>In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure) | SIGNIFICANCE if not mitigated | MITIGATION TYPE<br>(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.. | SIGNIFICANCE if mitigated |
|---|--|------------------|--|-------------------------------|---|---------------------------|
| Use of heavy machinery & vehicles on site for drilling  | Resource consumption (diesel - non-renewable resource)   | Fossil fuels     | Operational  | 24                            | Control through maintenance   | Low                       |
| Use of heavy machinery & vehicles on site for drilling  | Contamination of soils through hydrocarbon leaks and spills from machinery & equipment   | Soils            | Operational  | 18                            | Avoid through engineering controls. Remedy through clean-up   | Low                       |
| Use of heavy machinery & vehicles on site for   | Use of groundwater   | Groundwater      | Operational  | 18                            | Control through use of existing water supply.   | Low                       |

| NAME OF ACTIVITY<br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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.) | POTENTIAL IMPACT<br>(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | ASPECTS AFFECTED | PHASE<br>In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure) | SIGNIFICANCE if not mitigated | MITIGATION TYPE<br>(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.. | SIGNIFICANCE if mitigated |
|---|--|------------------|--|-------------------------------|---|---------------------------|
| drilling  | for drilling activities  |                  |  |                               | Avoid through sourcing of water from commercial supplier  |                           |
| Use of heavy machinery & vehicles on site for drilling  | Contamination of surface water through hydrocarbon leaks and spills from machinery & equipment   | Surface Water    | Operational  | 36                            | Avoid through buffer of 60 m  | Low                       |
| Use of heavy machinery & vehicles on site for drilling  | Contamination of groundwater through   | Groundwater      | Operational  | 18                            | Avoidance through engineering controls and clean-up   | Low                       |



| <b>NAME OF ACTIVITY</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>POTENTIAL IMPACT</b><br>(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b> | <b>PHASE</b><br>In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure) | <b>SIGNIFICANCE</b><br>if not mitigated | <b>MITIGATION TYPE</b><br>(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)<br>E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.. | <b>SIGNIFICANCE</b><br>if mitigated |
|--|---|-------------------------|---|---|---|-------------------------------------|
|  | hydrocarbon leaks and spills from machinery & equipment   |                         |   |   |   |                                     |
| Use of heavy machinery & vehicles on site for drilling   | Compaction of soils through movement of heavy vehicles and machinery on site  | Soils                   | Operational   | 8                                       | Avoid through limiting area. Remedy through concurrent rehabilitation   | Low                                 |
| Use of heavy machinery & vehicles on site for drilling   | Damage to vegetation  | Vegetation              | Operational   | 24                                      | Avoid through limiting area. Remedy through concurrent rehabilitation   | Low                                 |
| Use of heavy machinery   | Release of  | Air Quality             | Operational   | 36                                      | Control through   | Low                                 |

| <b>NAME OF ACTIVITY</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>POTENTIAL IMPACT</b><br>(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b>         | <b>PHASE</b><br>In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure) | <b>SIGNIFICANCE</b><br>if not mitigated | <b>MITIGATION TYPE</b><br>(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)<br>E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.. | <b>SIGNIFICANCE</b><br>if mitigated |
|--|---|---------------------------------|---|---|---|-------------------------------------|
| & vehicles on site for drilling  | gaseous emissions   |                                 |   |   | maintenance   |                                     |
| Use of heavy machinery & vehicles on site for drilling   | Dust Fallout  | Air Quality                     | Operational   | 24                                      | Control through speed limit & dust suppression  | Low                                 |
| Use of heavy machinery & vehicles on site for drilling   | Increase in ambient noise levels  | Social and Economic Environment | Operational   | 24                                      | Control through speed limit & operational times   | Low                                 |
| Use of heavy machinery & vehicles on site for drilling   | Visual intrusion  | Social and Economic Environment | Operational   | 8                                       | Control through limiting amount of drill rigs on property   | Low                                 |
| Use of heavy machinery & vehicles on site for drilling   | Disturbance of fauna species in the vicinity  | Fauna                           | Operational   | 48                                      | Remedy through concurrent rehabilitation of drill sites & test pits   | Low                                 |
| Use of heavy machinery   | Release of  | Air Quality                     | Operational   | 32                                      | Control through capping   | Low                                 |

| NAME OF ACTIVITY<br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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.) | POTENTIAL IMPACT<br>(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | ASPECTS AFFECTED | PHASE<br>In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure) | SIGNIFICANCE if not mitigated | MITIGATION TYPE<br>(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.. | SIGNIFICANCE if mitigated |
|---|--|------------------|--|-------------------------------|---|---------------------------|
| & vehicles on site for drilling   | methane gas from exploration boreholes   |                  |  |                               | of boreholes  |                           |
| Use of heavy machinery & vehicles on site for drilling  | Cross-contamination of aquifers due to borehole construction   | Groundwater      | Operational  | 72                            | Control through monitoring  | Low                       |
| Use of heavy machinery & vehicles on site for drilling  | Proliferation of invasive plant species  | Vegetation       | Operational  | 36                            | Avoid through cleaning of machinery   | Low                       |
| <b>Closure</b>  |  |                  |  |                               |   |                           |
| Concurrent rehabilitation   | Reducing soil compaction of  | Land Use & Land  | Closure  | 16                            | Remedy through concurrent rehabilitation  | Positive impact           |

| <b>NAME OF ACTIVITY</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>POTENTIAL IMPACT</b><br>(Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b>    | <b>PHASE</b><br>In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post closure) | <b>SIGNIFICANCE</b><br>if not mitigated | <b>MITIGATION TYPE</b><br>(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)<br>E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.. | <b>SIGNIFICANCE</b><br>if mitigated |
|--|---|----------------------------|---|---|---|-------------------------------------|
|  | disturbed area and access roads to improve drainage and control erosion   | Capability                 |   |   | of drill sites & test pits  |                                     |
| Concurrent rehabilitation  | Use stockpiled top soil to close sumps and test pits  | Soils                      | Closure   | 60                                      |   | Positive impact                     |
| Close drill hole   | Restoration of land use and land capability   | Land Use & Land Capability | Closure   | 18                                      | Control through capping of boreholes  | Positive impact                     |
|  |   |                            |   |   |   |                                     |

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked **Appendix 5**.

#### 9.4 SPECIALIST STUDIES

##### k) Summary of specialist reports.

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

| LIST OF STUDIES UNDERTAKEN  | RECOMMENDATIONS OF SPECIALIST REPORTS                                 | SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT<br>(Mark with an X where applicable) | REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED. |
|---|---|---|--|
| <i>No specialist studies required for the prospecting application</i> | <i>No specialist studies required for the prospecting application</i> | <i>No specialist studies required for the prospecting application</i>                                     | <i>No specialist studies required for the prospecting application</i>                          |
|   |   |   |  |
|   |   |   |  |

Attach copies of Specialist Reports as appendices

## I) Environmental impact statement

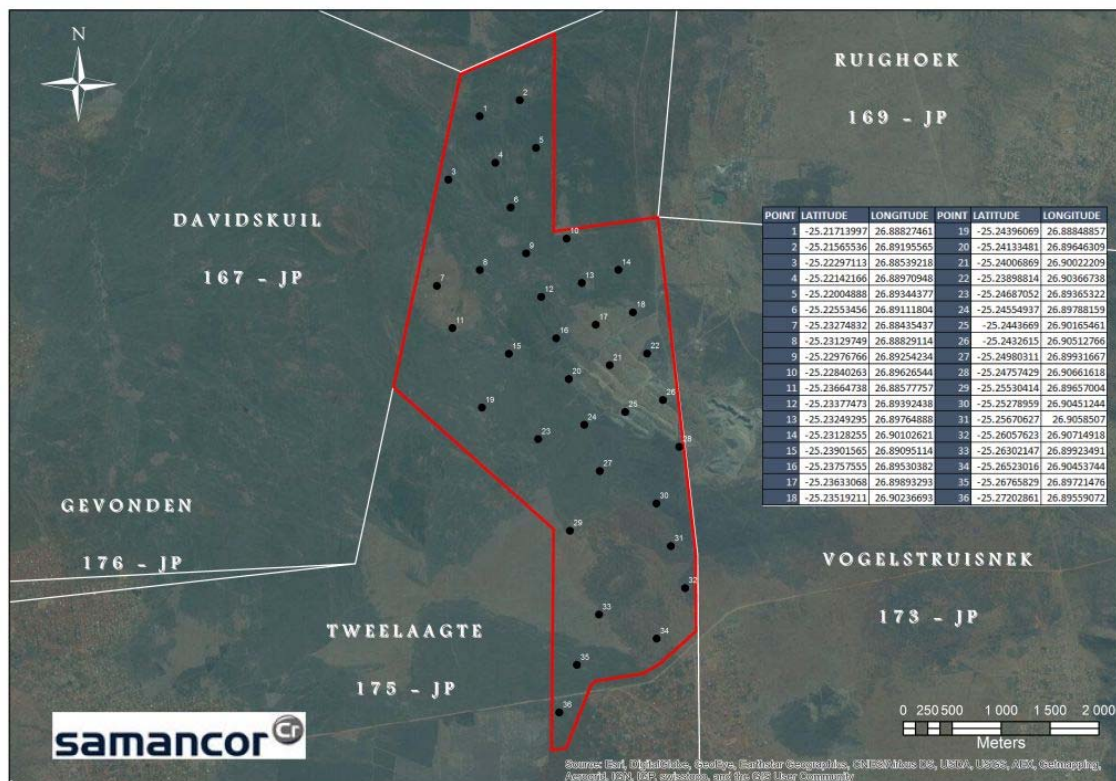
### (i) Summary of the key findings of the environmental impact assessment;

The possible environmental impacts associated with the proposed prospecting are considered insignificant. The drilling will be done by diamond drill rig, the drill team will not require site infrastructure and will not stay onsite. The main impacts are associated with the river and small hill located onsite. During the planning phase for each borehole rivers and/or streams will be identified. The prospecting programme will be designed to avoid the river and to leave a buffer zone of 60m. The river/stream will not be crossed, accesses, drained, dredged or filled during prospecting. A buffer of 50m must be kept from the small hill.

### (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. Attach as Appendix 4

Figure 38: Drill Grid showing location of drill holes and test pits



Source: Samancor

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

Positive Impact associated with the proposed Prospecting:

- Employment contributing to the economy

- Concurrent rehabilitation during prospecting

#### Negative Impacts associated with the proposed prospecting

- Loss of soil resources
- Use of vehicles onsite – compaction & dust
- Change of current land use
- Removal / damage of vulnerable natural vegetation
- Destruction of cultural heritage sites and artefacts
- Damage to sensitive biodiversity areas
- Disturbance of small hill
- Contamination of surface water
- Contamination of soils
- Litter

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

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

The objectives of the impact management process are as follows:

##### ***Air Quality:***

To ensure that the prospecting activities has a minimal adverse impact on air quality. Dust limitation and suppression to be applied.

##### ***Groundwater:***

To ensure that the prospecting activities have minimal adverse impact on the surrounding groundwater water quality and prevents pollution of existing groundwater resources.

##### ***Surface Water***

To ensure that the prospecting activities effectively utilise the consumption of freshwater, have minimal adverse impact on the surrounding surface water quality and prevent pollution of surrounding surface water resources. A buffer of 60m to be observed from the water course.

### ***Soils***

To ensure that the prospecting activities have a positive impact on land and soils by mitigating potential erosion, preventing contamination and pollution.

### ***Biodiversity***

To ensure that the prospecting activities do not have an adverse impact on the current biodiversity.

To ensure a buffer area of 50 m is kept from the small hill.

### ***Socio-Economic***

To aid in the improvement of the current local economy and improve the social environment of communities affected by the prospecting activities.

### ***Visual***

To limit the visual impact of the prospecting activities. Only one drill rig to be used and concurrent rehabilitation to be implemented

### ***Noise***

To control noise pollution stemming from the prospecting activities through the restriction of operational hours.

### ***Heritage***

To ensure that the prospecting activities avoid adverse impacts on the heritage resources of significance. Interaction with local residents to identify and confirm heritage sites. Marking and avoidance of sites if identified.

### ***Waste***

To ensure that the proposed prospecting operation adopts and implements waste management principles that are environmentally responsible.

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

Any aspects which must be made conditions of the Environmental Authorisation

- Prospecting should not occur within 50m of the small hill.
- 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

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

(Which relate to the assessment and mitigation measures proposed)

Uncertainties in terms of heritage resources. The exact location of heritage resources will have to be identified before any drilling activities start on site.

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

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

This is a proposed prospecting application to determine the value of the chromite mineral. The holes will be drilled to a maximum depth of 150m and will only be 60 - 75.7 mm in size.

Drilling will have low impact on existing farming activities and is not expected to impact on unidentified heritage artifacts. 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. All test pits, sumps, cut-off trenches and berms will be rehabilitated. Compacted areas (access roads, stockpile storage areas) will be scarified to a depth of 500 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**

- Prospecting should not occur within 50m of the small hill.
- 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

**q) Period for which the Environmental Authorisation is required**

5 years

**r) Undertaking**

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

Samancor Chrome Limited herewith confirm both its capacity and willingness to make the financial provision required should the prospecting right be granted.

**s) Financial Provision**

[REDACTED]

[REDACTED]

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

**1. General Surface Rehabilitation**

The prospecting plan consists of 42 boreholes and 6 test pits. No infrastructure will be constructed. Use will be made of existing roads where possible. The exploration boreholes will be drilled to a depth varying between 35-150m and 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. Additional pitting will be done to a depth of about 2m. Pitting will be restricted to six small areas. Drilling will take place one hole at a time. The drill site will be cleared of obstructions and debris and then drilled. Rehabilitation will occur concurrently with drilling.

Experience in other sites have indicated that including the turning circle of vehicle, the area disturbed by the drill sites rarely exceeds 100m<sup>2</sup> or 0.01 ha per hole. For the drilling of the envisaged 42 holes the areas to be affected will be approximately 0.42 ha. Fencing will be temporary. Although use will be made of existing roads provision is made for 750m<sup>2</sup> new routes to be built.

**2. 2-3 years Maintenance and Aftercare**

Should there be a need for maintenance and aftercare post the prospecting stage to ensure that the prospected areas have returned to their original state, an area of 0.47 ha, that includes all drill holes and test pit sites, will be considered.

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

The financial support for Samancor Chrome Limited proves the availability of funds to undertake prospecting the desired mineral.

**t) Specific Information required by the competent Authority**

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

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

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an Appendix .

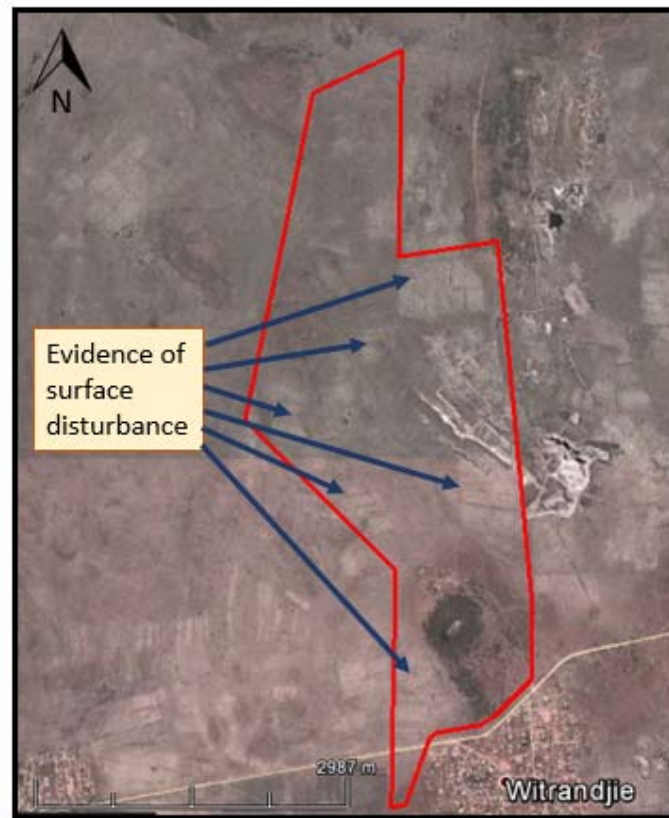
Prospecting could affect the existing farming activities where proposed drill holes are located in existing cultivated land. The drill hole will be closed immediately and will not be bigger than 80 mm in size. Should the prospecting right be granted an agreement with the landowner could stipulate conditions where under drill holes could be located within the crop (should any be required within the cultivated land). Kindly refer appendices for the social economic impacts. 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).

The area south of the dirt road has been previously disturbed by intensive agricultural activities. On the 2012 Google imagery map it is evident that even the surface area to the north of the dirt road has been disturbed. The presence of heritage resources at this site is highly unlikely.

**Figure 39: Evidence of surface disturbance north of the dirt road (2012)**



Potential heritage sites will be identified during the planning phase to ensure that such areas are avoided. Each prospecting site will be visited prior to any work starting to identify possible heritage sites. No specialist investigation has been conducted. Previous consultation with SARAH confirmed that if the disturbance area is below 1 ha, no Phase 1 Heritage Impact Assessment is required.

**u) 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 5).

Please refer to Appendix 5 for the Impact Table .

# PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME

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## 10 ENVIRONMENTAL MANAGEMENT PROGRAMME

### 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 Section 1(h).

### c) Composite Map

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

Please refer to Appendix 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 & pits 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 the 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 liters 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 existing boreholes authorised in terms of General Authorisations or sourced from commercial supplier and transported in via road tanker.



### iii) Impacts to be mitigated in their respective phases

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

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)   | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|---|---|--|--|--|--|
| Vegetation clearance for establishment of drill sites   | Operational   | 0.47 ha (drill sites, access routes)   | 1) Boreholes and access tracks will be located in areas that will result in minimal ground disturbance.<br>2) Permission will be obtained from landowners before trees are felled.<br>3) Where an access road is needed, the relevant occupant and owner will be consulted prior to the development of that access | Concurrent rehabilitation in line with sustainable development practices   | During drill site establishment  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|--|---|--|---|--|---|
|  |   |  | to ensure that consensus is reached on the matter and the access will be rehabilitated at the end of the drilling programme.<br>4) Vegetation clearance will be limited to 0.01 ha per drill hole                         |  |   |
| Vegetation clearance for establishment of drill sites  | Operational   | 0.47 ha  | 1) Topsoil will be stripped to a depth of 250 mm from all disturbed areas and stored outside the 1:50 year flood levels of rivers and streams, within the firebreak area.<br>2) Topsoil will be adequately protected from | Storage of topsoil in line with Regulation 70 of GN 527 (2004)   | During drill site establishment & drill operations  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants) | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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|  |   |  | being blown away or being eroded.<br>3) Boreholes and access tracks will be located in areas that will result in minimal ground disturbance.                     |  |  |
| Vegetation clearance for establishment of drill sites  | Operational   | The drilling of 42 drill holes of 60 - 75.7 mm in diameter - creation of 6 test pits     | 1) During the planning phase for each borehole, specific controls will be identified and implemented, based on site conditions.                                  | Number of boreholes and test pits stipulated in Prospecting Work Programme   | During drilling operations   |
| Vegetation clearance for establishment of drill sites  | Operational   | 0.47 ha ( drill sites, access routes)  | 1) Land disturbed will be rehabilitated to a stable and permanent form suitable for subsequent   | Concurrent rehabilitation in line with sustainable development practices   | Prior to drill site establishment  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|--|---|--|---|--|---|
|  |   |  | land use.<br>2) Exact location of drill holes, test pits and new access routes will be determined through communication with land owner   |  |   |
| Vegetation clearance, Site establishment , Drilling activities & movement of people and equipment on site  | Operational   | 0.47 ha (drill sites, access routes)   | 1) Potential heritage sites will be identified during the planning phase to ensure that such areas are avoided. Each prospecting site will be visited prior to any work starting to identify possible heritage sites.<br>2) Local knowledge will be | Avoidance in line with National Heritage Resources Act (No. 25 of 1999)  | Prior to drill site establishment   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|--|---|--|---|--|---|
|  |   |  | <p>used to identify and confirm heritage sites.</p> <p>3) Prospecting activities will be kept away from excluded and exempted areas.</p> <p>4) Where boreholes are sited in proximity to heritage sites and depending on the proximity to the drilling site, appropriate measures such as flagging, pegging or installation of temporary fencing will be undertaken to ensure that the site is not impacted on during</p> |  |   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m²) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)   | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|---|---|---|--|--|---|
|   |   |   | prospecting.   |  |   |
| Vegetation clearance for establishment of drill site  | Operational   | 1 drill hole - 0.01ha   | 1) A field survey will be undertaken before drilling commences at each drilling site to confirm that no ecologically sensitive areas or conservation areas are present in sections to be cleared.<br>2) Areas of ecological significance will be avoided and if disturbance is required, it will be undertaken in accordance with legislation. | Avoidance in line with National Biodiversity Act (10 of 2004)  | Prior to drill site establishment   |
| Vegetation clearance for establishment of drill   | Operational   | 0. 54 ha (drill sites & access routes)                                      | 1) Dust will be effectively controlled in all areas  | National Dust Control Regulations GN 827 (2013)  | During drill site establishment & drilling operations   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)   | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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| sites  |   |  | cleared from vegetation through water spraying.  |  |  |
| Vegetation clearance for establishment of drill sites  | Operational   | 9 drill holes = 0.09 ha  | 1) Controls will be aimed at minimising erosion and sediment washing from drill pads, access roads and other disturbed areas.<br>2) Sediment and erosion controls will be designed to prevent runoff from the prospecting site into rivers & streams.<br>3) Sediment and erosion controls may include cut-off trenches and drains, culverts for tracks, silt fences, straw bales, rock | Implementation of sediment controls in line with GN 704 and National Water Act (36 of 1998)  | During drill site establishment & drilling operations  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|---|---|--|---|--|---|
|   |   |  | armouring or mulching.  |  |   |
| Vegetation clearance for establishment of drill sites   | Operational   | 0. 47 ha (drill sites & access routes)   | 1) Prospecting activities will be discussed with landowners prior to work commencing.<br>2) Drill holes and access routes not wanted by land owners on completion of prospecting activities will be rehabilitated | Concurrent rehabilitation in line with sustainable development practices   | During to drill site establishment & drilling operations  |
| Workers & material on site  | Operational   | 0. 47 ha (drill sites & access routes)   | 1) A chemical toilet will be used on site during prospecting and will be used in such a way as to prevent water pollution. The use of a chemical toilet will be undertaken in                                     | Maintenance and replacement of chemical toilets in line with Regulation 71 of GN 527 (2004). Waste collection and disposal in line with Regulation 69 of GN 527 of   | For duration of prospecting activities on site  |



| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)   | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|---|---|--|--|--|---|
|   |   |  | consultation with the landowner.<br>2) Full or leaking toilets must be reported to the Supervisor for corrective action or replacement.<br>3) Prospecting areas will be maintained in a clean and tidy condition at all times.<br>4) All waste will be collected, separated and stored in properly constructed containers with lids and removed to an approved landfill or another site according to local municipal | 2004 and with National Environmental Management: Waste Act (59 of 2008)  |   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m²) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)   | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|---|---|---|--|--|---|
|   |   |   | requirements.<br>5) Full waste bins must be reported to the Supervisor for collection and disposal at an approved landfill.  |  |   |
| Workers & material on site  | Operational   | 2 159 ha (Total size of prospecting area - 5 workers on site)               | 1) No employees will be permitted to stay on the site.<br>2) Hunting / poaching will not be allowed.<br>3) Only one drill site at any given time. All employees present at the one drill site with appropriate supervision | No poaching in line with Animals Protection Act (No. 71 of 1962)   | For duration of prospecting activities on site  |
| Workers & material on site  | Operational   | 2 159 ha (Total size of   | 1) Vegetation around each exploration site within a  | Fire prevention in line with Regulation 65 of GN 527   | For duration of prospecting activities on site  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|---|---|--|---|--|--|
|   |   | prospecting area)  | 5m radius will be kept short to create a fire management zone.<br>2) Collection of firewood will not be allowed.<br>3) Open fires will be prohibited to people involved in prospecting.<br>4) No burning cigarettes or matches may be thrown down within the prospecting area. A bucket with sand will be provided for the disposal of cigarettes and matches.<br>5) No smoking will be allowed near gas, paints or | (2004) and with National Veld and Forest Fire Act  |  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m²) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)   | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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|  |   |   | fuel storage areas.<br>6) Suitable welding blankets are to be used when welding or operating grinders and this equipment is to be serviced regularly.<br>7) Rubbish or vegetation may under no circumstances be burnt. All waste will be removed off site and disposed of at an approved landfill. |  |   |
| Workers & material on site   | Operational   | 2 159 ha (Total size of prospecting area - 5 workers on site)               | 1) Collection of firewood will not be allowed.<br>2) Only one drill site at any given time. All employees  | Conditions stipulated in Access Agreement  | For duration of prospecting activities on site  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)   | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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|  |   |  | present at the one drill site with appropriate supervision<br>3) Complaints and outcomes of subsequent investigations will be recorded in a Complaints Register in the format of a spreadsheet.<br>4) If damage to private property occurs as a result of prospecting activities, such damage will be repaired or owners will be compensated as appropriate. |  |  |
| Workers & material on  | Operational   | 5 workers on site  | 1) Due to the nature of  | Contractual agreements   | For duration of prospecting  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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| site  |   |  | prospecting, employment opportunities will be minimal. The prospecting crew is small (8 people) with specialised skills. Were possible, local people will however be employed during the project.<br>2) Local people and businesses with appropriate skills will be identified and included in the project tender process. The applicant is committed to employ local people and businesses during the project, where possible. | between the service provider and the applicant   | activities on site   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m²) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)   | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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| Workers & material on site  | Operational   | 5 workers on site   | 1) Due to the nature of prospecting, employment opportunities will be minimal. The prospecting crew is small (8 people) with specialised skills. Were possible, local people will however be employed during the project.<br>2) No employees will be permitted to stay on site.<br>3) Aids awareness talks | National Strategic Plan on HIV, STIs and TB 2012-2016  | For duration of prospecting activities on site  |
| Use of heavy machinery & vehicles on site for drilling  | Operational   | 1 x drill rig, 1 x field vehicle  | 1) Vehicles and equipment to be serviced regularly and maintained in good working condition  | Maintenance of vehicles and equipment in line with responsible environmental management practice   | For duration of prospecting activities on site  |
| Use of heavy machinery  | Operational   | 1 x drill rig, 1 x  | 1) All chemicals, fuels and  | Prevention of soil pollution   | For duration of prospecting   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m²) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)   | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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| & vehicles on site for drilling  |   | field vehicle   | oils to be stored on site will be appropriately banded.<br>2) Precautions will be taken to prevent spills and soil contamination.<br>3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements to ensure correct clean-up procedure.<br>4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site. | in line with Regulation 70 of GN 527 (2004)  | activities on site   |



| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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| Use of heavy machinery & vehicles on site for drilling   | Operational   | 42 drill sites   | 1) Existing water supply locations will be identified for use and agreements will be reached with landowners regarding on-site water use. The drilling rig will require approximately 1,000l/day. Where a suitable water supply is not available, water will be sourced from a commercial supplier and delivered to site by water tanker.<br>2) If required, a water use license will be applied for to DWS for the abstraction | Responsible use of groundwater resources in line with Regulation 68 of GN 527 (2004) and with the National Water Act (36 of 1998)  | For duration of prospecting activities on site  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> )   | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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|  |   |  | of surface- and/or groundwater during prospecting.<br>3) Adequate provision will be made for storing drinking water on site in the form of 2500 litre plastic water tanks.  |  |   |
| Use of heavy machinery & vehicles on site for drilling   | Operational   | Non-perennial tributary of Sandspruit River - southern section. 9 drill holes in that area | 1) The drilling fluid that will be used during prospecting must be biodegradable and not pose a water pollution threat.<br>2) Drilling sumps and containment measures will be designed to contain all drilling fluid. | Buffer of 60 m greater than 32 m stipulated in NEMA 2014 EIA Regulations   | Prior to establishing drill sites in southern section   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m²) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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|  |   |   | 3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements top ensure correct clean-up procedure.<br>4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved landfill site.<br>5) Drill sites to be located 60 m from rivers & stream. |  |   |
| Use of heavy machinery & vehicles on site for drilling   | Operational   | 2 159 ha (Total size of prospecting area)                                   | 1) Machinery and equipment will only be maintained over a drip  | Prevention of groundwater pollution in line with National Water Act (36 of   | For duration of prospecting activities on site  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)   | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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|   |   |  | tray, a thin concrete slab or a PVC lining to prevent soil and water contamination.<br>2) No vehicle will be extensively repaired on site.<br>3) Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean-up requirements to ensure correct clean-up procedure.<br>4) Any contaminated soil will be collected into non-permeable bags and disposed of to an approved | 1998)  |   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)                                 | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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|   |   |  | landfill site.   |  |   |
| Use of heavy machinery & vehicles on site for drilling  | Operational   | 0.47 ha (drill sites, access routes)   | 1) Stay on predefined areas and routes.<br>2) Scarify access roads and stockpile areas to a depth of 500 mm and restore topsoil cover.<br>3) Re-seed or plant vegetation indigenous to the area. | Concurrent rehabilitation in line with sustainable development practices   | Concurrently on completion of drilling activities at drill site   |
| Use of heavy machinery & vehicles on site for drilling  | Operational   | 0.47 ha (drill sites, access routes)   | 1) Vehicles will only stay on dedicated roads (turning circles).<br>2) No movement of heavy machinery outside dedicated routes.<br>3) All routes and turning                                     | Concurrent rehabilitation in line with sustainable development practices   | Concurrently on completion of drilling activities at drill site   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)                | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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|   |   |  | circles will be scarified and re-seeded with seeds from vegetation indigenous to the area.  |  |   |
| Use of heavy machinery & vehicles on site for drilling  | Operational   | 1 x drill rig, 1 x field vehicle   | 1) Vehicles and equipment will be maintained in a good working order.   | Maintenance of vehicles and equipment in line with responsible environmental management practice   | For duration of prospecting activities on site  |
| Use of heavy machinery & vehicles on site for drilling  | Operational   | 0.47 ha (drill sites, access routes)   | 1) Speed limits on gravel roads will be 40km/hr to minimise dust and noise generation.<br>2) Dust will be effectively controlled in all disturbed areas through water spraying. | National Dust Control Regulations GN 827 (2013)  | During drill site establishment & drilling operations   |
| Use of heavy machinery  | Operational   | 1 x drill rig, 1 x   | 1) Speed limits on gravel   | Noise Standards - SANS   | For duration of prospecting   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants) | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|---|---|--|--|--|---|
| & vehicles on site for drilling   |   | field vehicle  | roads will be 40 km/hr to minimise dust and noise generation.<br>2) Prospecting activities will be restricted to day light hours.                                | 10103:2008   | activities on site  |
| Use of heavy machinery & vehicles on site for drilling  | Operational   | 1 x drill rig  | 1) Only one site to be drilled at any one time<br>2) Concurrent rehabilitation   |  | For duration of prospecting activities on site  |
| Use of heavy machinery & vehicles on site for drilling  | Operational   | 0.47 ha (drill sites, access routes)   | 1) Prospecting activities will be kept away from excluded and exempted areas.<br>2) A field survey will be undertaken before drilling commences at each drilling | Number of boreholes and test pits stipulated in Prospecting Work Programme   | During drilling operations  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)   | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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|  |   |  | <p>site to confirm that no threatened species, ecologically sensitive areas or conservation areas are present in sections to be cleared.</p> <p>3) Areas of ecological significance will be avoided and if disturbance is required, it will be undertaken in accordance with legislation.</p> <p>4) One site to be drilled at a time.</p> <p>5) Concurrent rehabilitation.</p> |  |   |
| Use of heavy machinery   | Operational   | 42 Boreholes   | 1) Exploration boreholes   | Capping of boreholes in  | For duration of prospecting   |



| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m²) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)                                    | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
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| & vehicles on site for drilling   |   |   | are to be capped when no drilling work is being undertaken.<br>2) Exploration boreholes which will not be used during production to be sealed with cement once exploration work has been completed. | line with sustainable management principles  | activities on site   |
| Use of heavy machinery & vehicles on site for drilling  | Operational   | 42 Boreholes  | 1) For the purpose of future monitoring programmes, impact assessments and concurrent rehabilitation, the depth of water strikes will be recorded during exploration drilling.                      | Responsible use of groundwater resources in line with Regulation 68 of GN 527 (2004) and with the National Water Act (36 of 1998)  | For duration of prospecting activities on site   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|--|---|--|---|--|---|
|  |   |  | 2) The static groundwater level will be monitored in prospecting boreholes that intersected water after completion and before concurrent rehabilitation for future monitoring, impact assessment and concurrent rehabilitation purposes.<br>3) Any completed hole that is not required for groundwater monitoring, will be sealed to prevent groundwater contamination. |  |   |
| Use of heavy machinery   | Operational   | 0.47 ha (drill sites,  | 1) Machinery will be  | Prevention of proliferation  | For duration of prospecting   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br>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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m²) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|---|---|---|---|--|--|
| & vehicles on site for drilling   |   | access routes)  | cleared of dust/mud and seed prior to relocation to the next site to prevent the spread of alien invasive species.  | of invasive plant species in line with National Environmental Management Biodiversity Act (10 of 2004)   | activities on site   |
| <b>Closure</b>  |   |   |   |  |  |
| Concurrent rehabilitation   | Closure   | 0.47 ha (drill sites, access routes)  | 1) 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.<br>2) Erosion and sediment controls as well as the | Concurrent rehabilitation in line with sustainable development practices   | During drilling operations after site has been rehabilitated   |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m²) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|--|---|---|---|--|---|
|  |   |   | disturbed area will be rehabilitated a<br>3) 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 as required. |  |   |
| Concurrent rehabilitation  | Closure   | 0.47 ha (drill sites, access routes)  | 1) Scarify access roads and stockpile storage areas to a depth of 500 mm.<br>2) Restore topsoil cover.<br>3) Re-seed or plant vegetation indigenous to  | Concurrent rehabilitation in line with sustainable development practices   | During drilling operations after site has been rehabilitated  |

| <b>ACTIVITIES</b><br>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc<br><b>E.g. For mining,-</b> 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>PHASE</b><br>(of operation in which activity will take place. State; Planning and design, Pre-Construction, Construction, Operational, Rehabilitation, Closure, Post closure). | <b>SIZE AND SCALE</b> of disturbance (volumes, tonnages and hectares or m <sup>2</sup> ) | <b>MITIGATION MEASURES</b><br>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)  | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. |
|--|---|--|---|--|---|
| Close drill hole   | Closure   | 42 Boreholes   | the area.<br>1) Exploration boreholes are to be capped when no drilling work is being undertaken.<br>2) Exploration boreholes which will not be used during production to be sealed with cement once exploration work has been completed. | Capping of boreholes in line with sustainable management principles  | For duration of prospecting activities on site  |

## e) Impact Management Outcomes

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

| <b>ACTIVITY</b><br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b>    | <b>PHASE</b><br>In which impact is anticipated<br>(e.g. Construction, commissioning, operational Decommissioning, closure, post- closure) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method.<br>• Control through noise control Control through management and monitoring remedy through rehabilitation.. | <b>STANDARD TO BE ACHIEVED</b><br>(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc. |
|---|--|----------------------------|---|--|--|
| Vegetation clearance for establishment of drill sites   | Removal of / damage to natural vegetation  | Vegetation                 | Operational   | Control through limiting area  | Rehabilitate impacted area to be in line with current land use   |
| Vegetation clearance for establishment of drill sites   | The stripping of soil, incorrect stockpiling, erosion and storm water run-off can lead to the loss of topsoil  | Soils                      | Operational   | Control through storing of topsoil and protecting topsoil stockpiles   | Impact avoided through storage of topsoil  |
| Vegetation clearance for establishment of drill sites   | Changes to the shape or form of the land   | Topography                 | Operational   | Remedy through concurrent rehabilitation of drill sites & test pits  | Rehabilitate impacted area to be in line with current land use   |
| Vegetation clearance for establishment of drill sites   | Impact on current land use   | Land Use & Land Capability | Operational   | Control via communication with land owner  | Minimise disturbance to and alternation of current land use practices  |

| <b>ACTIVITY</b><br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b>      | <b>PHASE</b><br>In which impact is anticipated<br>(e.g. Construction, commissioning, operational Decommissioning, closure, post- closure) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method.<br>• Control through noise control Control through management and monitoring remedy through rehabilitation.. | <b>STANDARD TO BE ACHIEVED</b><br>(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc. |
|---|--|------------------------------|---|--|--|
| Vegetation clearance, Site establishment , Drilling activities & movement of people and equipment on site   | Destruction of cultural heritage sites and artefacts   | Cultural Heritage            | Operational   | Stop through identification of sites and protecting  | Avoid impact - identify as no go area  |
| Vegetation clearance for establishment of drill site  | Damage to sensitive biodiversity areas (small hill)  | Sensitive Biodiversity Areas | Operational   | Stop through identification of areas and buffering of small hill (50 m)  | Impact avoided   |
| Vegetation clearance for establishment of drill sites   | Dust pollution   | Air Quality                  | Operational   | Control through dust suppression   | Dust suppression to ensure dust fall out is below thresholds stipulated in Dust Control Regulations                              |
| Vegetation clearance for establishment of drill sites   | Storm water run-off from cleared areas could lead to siltation of surface water  | Surface Water                | Operational   | Control through implementation of sediment and erosion controls  | Rehabilitate impacted area to be in line with current land use   |
| Vegetation clearance for  | Disturbance of farming /   | Social and Economic          | Operational   | Control via  | Minimise disturbance of  |

| <b>ACTIVITY</b><br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b>                   | <b>PHASE</b><br>In which impact is anticipated<br>(e.g. Construction, commissioning, operational Decommissioning, closure, post- closure) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method.<br>• Control through noise control Control through management and monitoring remedy through rehabilitation.. | <b>STANDARD TO BE ACHIEVED</b><br>(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc. |
|---|--|---|---|--|--|
| establishment of drill sites  | tourism activities   | Environment                               |   | communication with land owner  | current activities on area   |
| Workers & material on site  | Contamination of soils through spills from sanitation facilities & litter  | Soils                                     | Operational   | Control through placement of facility and regular maintenance. Collection of waste   | Impact to be controlled to avoid contamination of soil   |
| Workers & material on site  | Poaching   | Fauna                                     | Operational   | Control through supervision and operational hours on site  | No loss of cattle and/ or wildlife   |
| Workers & material on site  | Fire   | Social and Economic & Ecology Environment | Operational   | Avoid through Code of Conduct & Control through Fire Breaks  | No fires   |
| Workers & material on site  | Collection of fire wood, damage to property  | Vegetation                                | Operational   | Control through supervision and operational hours on site  | No complaints from land owners, no collection of fire wood   |
| Workers & material on site  | Contribution to the economy through employment   | Social and Economic Environment           | Operational   | Employment of local people and businesses where possible   | Creation of employment opportunities   |
| Workers & material on site  | Spread of HIV/Aids to  | Social and Economic                       | Operational   | Control through  | Impact to be avoided   |



| <b>ACTIVITY</b><br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b> | <b>PHASE</b><br>In which impact is anticipated<br>(e.g. Construction, commissioning, operational Decommissioning, closure, post- closure) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method.<br>• Control through noise control Control through management and monitoring remedy through rehabilitation.. | <b>STANDARD TO BE ACHIEVED</b><br>(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc. |
|---|--|-------------------------|---|--|--|
|   | farm workers and local community   | Environment             |   | awareness  |  |
| Use of heavy machinery & vehicles on site for drilling  | Resource consumption (diesel - non-renewable resource)   | Fossil fuels            | Operational   | Control through maintenance  | Well maintained equipment & vehicles (annually)  |
| Use of heavy machinery & vehicles on site for drilling  | Contamination of soils through hydrocarbon leaks and spills from machinery & equipment   | Soils                   | Operational   | Avoid through engineering controls. Remedy through clean-up  | No hydrocarbon spillages   |
| Use of heavy machinery & vehicles on site for drilling  | Use of groundwater for drilling activities   | Groundwater             | Operational   | Control through use of existing water supply. Avoid through sourcing of water from commercial supplier   | Avoid wastage of groundwater. Legal use of groundwater   |
| Use of heavy machinery & vehicles on site for drilling  | Contamination of surface water through hydrocarbon leaks and spills from machinery & equipment   | Surface Water           | Operational   | Avoid through buffer of 60 m   | Impact avoided   |

| <b>ACTIVITY</b><br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b> | <b>PHASE</b><br>In which impact is anticipated<br>(e.g. Construction, commissioning, operational Decommissioning, closure, post- closure) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method.<br>• Control through noise control Control through management and monitoring remedy through rehabilitation.. | <b>STANDARD TO BE ACHIEVED</b><br>(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc. |
|---|--|-------------------------|---|--|--|
| Use of heavy machinery & vehicles on site for drilling  | Contamination of groundwater through hydrocarbon leaks and spills from machinery & equipment   | Groundwater             | Operational   | Avoidance through engineering controls and clean-up  | No groundwater contamination   |
| Use of heavy machinery & vehicles on site for drilling  | Compaction of soils through movement of heavy vehicles and machinery on site   | Soils                   | Operational   | Avoid through limiting area. Remedy through concurrent rehabilitation  | Limit areas of compaction. Rehabilitate impacted area to be in line with current land use  |
| Use of heavy machinery & vehicles on site for drilling  | Damage to vegetation   | Vegetation              | Operational   | Avoid through limiting area. Remedy through concurrent rehabilitation  | Limit areas. Rehabilitate impacted area to be in line with current land use  |
| Use of heavy machinery & vehicles on site for drilling  | Release of gaseous emissions   | Air Quality             | Operational   | Control through maintenance  | Well maintained equipment & vehicles (annually)  |
| Use of heavy machinery & vehicles on site for drilling  | Dust Fallout   | Air Quality             | Operational   | Control through speed limit & dust suppression   | Dust suppression to ensure dust fall out is  |

| <b>ACTIVITY</b><br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b>         | <b>PHASE</b><br>In which impact is anticipated<br>(e.g. Construction, commissioning, operational Decommissioning, closure, post- closure) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method.<br>• Control through noise control Control through management and monitoring remedy through rehabilitation.. | <b>STANDARD TO BE ACHIEVED</b><br>(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc. |
|---|--|---------------------------------|---|--|--|
|   |  |                                 |   |  | below thresholds stipulated in Dust Control Regulations  |
| Use of heavy machinery & vehicles on site for drilling  | Increase in ambient noise levels   | Social and Economic Environment | Operational   | Control through speed limit & operational times  | Ambient noise levels to be below thresholds stipulated in SANS 10103:2008 for sub-urban sound environment-                       |
| Use of heavy machinery & vehicles on site for drilling  | Visual intrusion   | Social and Economic Environment | Operational   | Control through limiting amount of drill rigs on property  | No complaints from land owners.  |
| Use of heavy machinery & vehicles on site for drilling  | Disturbance of fauna species in the vicinity   | Fauna                           | Operational   | Remedy through concurrent rehabilitation of drill sites & test pits  | Rehabilitate impacted area to be in line with current land use   |
| Use of heavy machinery & vehicles on site for drilling  | Release of methane gas from exploration boreholes  | Air Quality                     | Operational   | Control through capping of boreholes   | Capping of all boreholes that releases methane gas   |
| Use of heavy machinery &  | Cross-contamination of   | Groundwater                     | Operational   | Control through  | Recording of depth of  |

| <b>ACTIVITY</b><br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>ASPECTS AFFECTED</b>    | <b>PHASE</b><br>In which impact is anticipated<br>(e.g. Construction, commissioning, operational Decommissioning, closure, post- closure) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method.<br>• Control through noise control Control through management and monitoring remedy through rehabilitation.. | <b>STANDARD TO BE ACHIEVED</b><br>(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc. |
|---|--|----------------------------|---|--|--|
| vehicles on site for drilling   | aquifers due to borehole construction  |                            |   | monitoring   | water strikes and static groundwater level   |
| Use of heavy machinery & vehicles on site for drilling  | Proliferation of invasive plant species  | Vegetation                 | Operational   | Avoid through cleaning of machinery  | No proliferation of invasive plant species   |
| <b>Closure</b>  |  |                            |   |  |  |
| Concurrent rehabilitation   | Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion  | Land Use & Land Capability | Closure   | Remedy through concurrent rehabilitation of drill sites & test pits  | Rehabilitate impacted area to be in line with current land use   |
| Concurrent rehabilitation   | Use stockpiled top soil to close sumps and test pits   | Soils                      | Closure   |  | Rehabilitate impacted area to be in line with current land use   |
| Close drill hole  | Restoration of land use and land capability  | Land Use & Land Capability | Closure   | Control through capping of boreholes   | Capping of all boreholes that releases methane gas   |

**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).

| <b>ACTIVITY</b><br>whether listed or not listed.<br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method. • Control through noise control<br>• Control through management and monitoring<br>Remedy through rehabilitation.. | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented<br>Measures must be implemented when required.<br>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) |
|--|--|--|---|--|
| Vegetation clearance for establishment of drill sites  | Removal of / damage to natural vegetation  | Control through limiting area  | During drill site establishment   | Concurrent rehabilitation in line with sustainable development practices   |
| Vegetation clearance for establishment of drill sites  | The stripping of soil, incorrect stockpiling, erosion and storm water run-off can lead to the loss of topsoil  | Control through storing of topsoil and protecting topsoil stockpiles   | During drill site establishment & drill operations  | Storage of topsoil in line with Regulation 70 of GN 527 (2004)   |
| Vegetation clearance for establishment of drill sites  | Changes to the shape or form of the land   | Remedy through concurrent rehabilitation of drill sites & test pits  | During drilling operations  | Number of boreholes and test pits stipulated in Prospecting Work Programme   |
| Vegetation clearance for establishment of drill sites  | Impact on current land use   | Control via communication with land owner  | Prior to drill site establishment   | Concurrent rehabilitation in line with sustainable development practices   |
| Vegetation clearance, Site establishment , Drilling activities & movement of people and equipment on site  | Destruction of cultural heritage sites and artefacts   | Stop through identification of sites and protecting  | Prior to drill site establishment   | Avoidance in line with National Heritage Resources Act (No. 25 of 1999)  |
| Vegetation clearance for establishment of drill site   | Damage to sensitive biodiversity areas (small hill)  | Stop through identification of areas and buffering of small hill   | Prior to drill site establishment   | Avoidance in line with National Biodiversity Act (10 of 2004)  |

| <b>ACTIVITY</b><br>whether listed or not listed.<br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method. • Control through noise control<br>• Control through management and monitoring<br>Remedy through rehabilitation.. | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented<br>Measures must be implemented when required.<br>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) |
|--|--|--|---|--|
|  |  | (50 m)   |   |  |
| Vegetation clearance for establishment of drill sites  | Dust pollution   | Control through dust suppression   | During drill site establishment & drilling operations   | National Dust Control Regulations GN 827 (2013)  |
| Vegetation clearance for establishment of drill sites  | Storm water run-off from cleared areas could lead to siltation of surface water  | Control through implementation of sediment and erosion controls  | During drill site establishment & drilling operations   | Implementation of sediment controls in line with GN 704 and National Water Act (36 of 1998)  |
| Vegetation clearance for establishment of drill sites  | Disturbance of farming / tourism activities  | Control via communication with land owner  | During to drill site establishment & drilling operations  | Concurrent rehabilitation in line with sustainable development practices   |
| Workers & material on site   | Contamination of soils through spills from sanitation facilities & litter  | Control through placement of facility and regular maintenance. Collection of waste   | For duration of prospecting activities on site  | Maintenance and replacement of chemical toilets in line with Regulation 71 of GN 527 (2004). Waste collection and disposal in line with Regulation 69 of GN 527 of 2004 and with National Environmental Management: Waste Act (59 of 2008)                           |
| Workers & material on site   | Poaching   | Control through supervision and operational hours on site  | For duration of prospecting activities on site  | No poaching in line with Animals Protection Act (No. 71 of 1962)   |
| Workers & material on site   | Fire   | Avoid through Code of Conduct & Control through Fire Breaks  | For duration of prospecting activities on site  | Fire prevention in line with Regulation 65 of GN 527 (2004)  |

| <b>ACTIVITY</b><br>whether listed or not listed.<br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method. • Control through noise control<br>• Control through management and monitoring<br>Remedy through rehabilitation.. | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented<br>Measures must be implemented when required.<br>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) |
|--|--|--|---|--|
|  |  |  |   | and with National Veld and Forest Fire Act   |
| Workers & material on site   | Collection of fire wood, damage to property  | Control through supervision and operational hours on site  | For duration of prospecting activities on site  | Conditions stipulated in Access Agreement  |
| Workers & material on site   | Contribution to the economy through employment   | Employment of local people and businesses where possible   | For duration of prospecting activities on site  | Contractual agreements between the service provider and the applicant  |
| Workers & material on site   | Spread of HIV/Aids to farm workers and local community   | Control through awareness  | For duration of prospecting activities on site  | National Strategic Plan on HIV, STIs and TB 2012-2016  |
| Use of heavy machinery & vehicles on site for drilling   | Resource consumption (diesel - non-renewable resource)   | Control through maintenance  | For duration of prospecting activities on site  | Maintenance of vehicles and equipment in line with responsible environmental management practice   |
| Use of heavy machinery & vehicles on site for drilling   | Contamination of soils through hydrocarbon leaks and spills from machinery & equipment   | Avoid through engineering controls. Remedy through clean-up  | For duration of prospecting activities on site  | Prevention of soil pollution in line with Regulation 70 of GN 527 (2004)   |
| Use of heavy machinery & vehicles on site for drilling   | Use of groundwater for drilling activities   | Control through use of existing water supply. Avoid through sourcing of water from commercial supplier   | For duration of prospecting activities on site  | Responsible use of groundwater resources in line with Regulation 68 of GN 527 (2004) and with the National Water Act (36 of 1998)  |
| Use of heavy machinery &   | Contamination of surface water   | Avoid through buffer of 60m  | Prior to establishing drill sites in  | Buffer of 60 m greater than 32   |



| <b>ACTIVITY</b><br>whether listed or not listed.<br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method. • Control through noise control<br>• Control through management and monitoring<br>Remedy through rehabilitation.. | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented<br>Measures must be implemented when required.<br>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) |
|--|--|--|---|--|
| vehicles on site for drilling  | through hydrocarbon leaks and spills from machinery & equipment  |  | southern section  | m stipulated in NEMA 2014 EIA Regulations  |
| Use of heavy machinery & vehicles on site for drilling   | Contamination of groundwater through hydrocarbon leaks and spills from machinery & equipment   | Avoidance through engineering controls and clean-up  | For duration of prospecting activities on site  | Prevention of groundwater pollution in line with National Water Act (36 of 1998)   |
| Use of heavy machinery & vehicles on site for drilling   | Compaction of soils through movement of heavy vehicles and machinery on site   | Avoid through limiting area. Remedy through concurrent rehabilitation  | Concurrently on completion of drilling activities at drill site   | Concurrent rehabilitation in line with sustainable development practices   |
| Use of heavy machinery & vehicles on site for drilling   | Damage to vegetation   | Avoid through limiting area. Remedy through concurrent rehabilitation  | Concurrently on completion of drilling activities at drill site   | Concurrent rehabilitation in line with sustainable development practices   |
| Use of heavy machinery & vehicles on site for drilling   | Release of gaseous emissions   | Control through maintenance  | For duration of prospecting activities on site  | Maintenance of vehicles and equipment in line with responsible environmental management practice   |
| Use of heavy machinery & vehicles on site for drilling   | Dust Fallout   | Control through speed limit & dust suppression   | During drill site establishment & drilling operations   | National Dust Control Regulations GN 827 (2013)  |
| Use of heavy machinery & vehicles on site for drilling   | Increase in ambient noise levels   | Control through speed limit & operational times  | For duration of prospecting activities on site  | Noise Standards - SANS 10103:2008  |
| Use of heavy machinery &   | Visual intrusion   | Control through limiting   | For duration of prospecting   |  |



| <b>ACTIVITY</b><br>whether listed or not listed.<br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • Modify through alternative method. • Control through noise control<br>• Control through management and monitoring<br>Remedy through rehabilitation.. | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented<br>Measures must be implemented when required.<br>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) |
|--|--|--|---|--|
| vehicles on site for drilling  |  | amount of drill rigs on property   | activities on site  |  |
| Use of heavy machinery & vehicles on site for drilling   | Disturbance of fauna species in the vicinity   | Remedy through concurrent rehabilitation of drill sites & test pits  | During drilling operations  | Number of boreholes and test pits stipulated in Prospecting Work Programme   |
| Use of heavy machinery & vehicles on site for drilling   | Release of methane gas from exploration boreholes  | Control through capping of boreholes   | For duration of prospecting activities on site  | Capping of boreholes in line with sustainable management principles  |
| Use of heavy machinery & vehicles on site for drilling   | Cross-contamination of aquifers due to borehole construction   | Control through monitoring   | For duration of prospecting activities on site  | Responsible use of groundwater resources in line with Regulation 68 of GN 527 (2004) and with the National Water Act (36 of 1998)  |
| Use of heavy machinery & vehicles on site for drilling   | Proliferation of invasive plant species  | Avoid through cleaning of machinery  | For duration of prospecting activities on site  | Prevention of proliferation of invasive plant species in line with National Environmental Management Biodiversity Act (10 of 2004)   |
| <b>Closure</b>   |  |  |   |  |
| Concurrent rehabilitation  | Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion  | Remedy through concurrent rehabilitation of drill sites & test pits  | During drilling operations after site has been rehabilitated  | Concurrent rehabilitation in line with sustainable development practices   |

| <b>ACTIVITY</b><br>whether listed or not listed.<br>(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.). | <b>POTENTIAL IMPACT</b><br>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...) | <b>MITIGATION TYPE</b><br>(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)<br>E.g. • <b>Modify</b> through alternative method. • <b>Control</b> through noise control<br>• <b>Control</b> through management and monitoring<br><b>Remedy</b> through rehabilitation.. | <b>TIME PERIOD FOR IMPLEMENTATION</b><br>Describe the time period when the measures in the environmental management programme must be implemented<br>Measures must be implemented when required.<br>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be. | <b>COMPLIANCE WITH STANDARDS</b><br>(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) |
|--|--|--|---|--|
| Concurrent rehabilitation  | Use stockpiled top soil to close sumps and test pits   |  | During drilling operations after site has been rehabilitated  | Concurrent rehabilitation in line with sustainable development practices   |
| Close drill hole   | Restoration of land use and land capability  | Control through capping of boreholes   | For duration of prospecting activities on site  | Capping of boreholes in line with sustainable management principles  |

**i) Financial Provision**

**(1) Determination of the amount of Financial Provision.**

**(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.**

The following closure objectives will be applicable for concurrent rehabilitation:

- Land disturbed will be rehabilitated to a stable and permanent form suitable for subsequent land use e.g. crop farming and cattle grazing.
- The final land use will be similar to surrounding land-use i.e. crop farming & cattle grazing
- There will be no adverse environmental effect outside the small disturbed areas (0.47 ha) and the affected area will be shaped to ensure effective drainage.

The closure objectives are to minimise disturbance wherever possible so that normal land use can continue after closure.

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

To be completed after PPP

**(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.**

Please note this is an application for the prospecting of chromite. Approximately 42 holes will be drilled and 6 test pits will be created. Drilled holes and test pits will be closed/ rehabilitated concurrently with drilling.

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

Safety after the completion of the prospecting activities will be done by concurrent rehabilitation of drill holes. Overburden will be recorded and the holes filled back simultaneously.

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

Please refer to Quantum Appendix 6.

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

Samancor Chrome Limited herewith confirms both its capacity and willingness to make the financial provision required should the prospecting right be granted.

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

g) Monitoring of Impact Management Actions

h) Monitoring and reporting frequency

i) Responsible persons

j) Time period for implementing impact management actions

k) 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> |
|---|---|---|--|---|
| Vegetation clearance for establishment of drill sites   | Removal of / damage to natural vegetation   | Visual checks that no more than 0.01 ha vegetation is removed per drill hole  | Site supervisor  | Annual Performance Assessment & Reporting<br>Application for Closure Certificate                      |
| Vegetation clearance for establishment of drill sites   | The stripping of soil, incorrect stockpiling, erosion and storm water run-off can lead to the loss of topsoil | Ensure removal of 250 mm topsoil and storage thereof. Visual checks to ensure topsoil stockpile is protected from being blown away or being eroded. | Site supervisor  | Annual Performance Assessment & Reporting   |
| Vegetation clearance for establishment of drill sites   | Changes to the shape or form of the land  | Drill equipment - 60mm - 75.7 mm drill rigs. Test pits limited to 6   | Site supervisor  | Annual Performance Assessment & Reporting<br>Application for Closure Certificate                      |
| Vegetation clearance for establishment of drill sites   | Impact on current land use  | Communication with land owner. Access agreement conditions  | Site supervisor  | Annual Performance Assessment & Reporting<br>Application for Closure Certificate                      |
| Vegetation clearance, Site establishment , Drilling activities & movement of people and equipment on site | Destruction of cultural heritage sites and artefacts  | Communication with land occupiers and land owners to identify sites of cultural importance. Identification of such sites as no-go areas             | Site supervisor  | Annual Performance Assessment & Reporting   |

| SOURCE ACTIVITY                                       | IMPACTS REQUIRING MONITORING PROGRAMMES   | FUNCTIONAL REQUIREMENTS FOR MONITORING   | ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES) | MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS |
|---|---|--|---|--|
| Vegetation clearance for establishment of drill site  | Damage to sensitive biodiversity areas (small hill)                             | Avoid drilling activities in vicinity of small hill. Provide for 50 m buffer around small hill     | Site supervisor   | Annual Performance Assessment & Reporting  |
| Vegetation clearance for establishment of drill sites | Dust pollution  | Dust suppression - dry season  | Site supervisor   | Annual Performance Assessment & Reporting  |
| Vegetation clearance for establishment of drill sites | Storm water run-off from cleared areas could lead to siltation of surface water | Establishment of sediment controls at drill site and access routes                                 | Site supervisor   | Annual Performance Assessment & Reporting  |
| Vegetation clearance for establishment of drill sites | Disturbance of farming / tourism activities                                     | Communication with land owner. Access agreement conditions   | Site supervisor   | Annual Performance Assessment & Reporting<br>Application for Closure Certificate               |
| Workers & material on site                            | Contamination of soils through spills from sanitation facilities & litter       | Regular maintenance of chemical toilets. Replacement if required. Collection and disposal of waste | Site supervisor   | Annual Performance Assessment & Reporting  |
| Workers & material on site                            | Poaching  | Daily attendance checks and register   | Site supervisor   | Annual Performance Assessment & Reporting  |
| Workers & material on site                            | Fire  | Visual checks to ensure fire breaks is in place and Code of Conduct is adhered to                  | Site supervisor   | Annual Performance Assessment & Reporting  |
| Workers & material on site                            | Collection of fire wood, damage to property                                     | Complaints register & daily attendance register  | Site supervisor   | Annual Performance Assessment & Reporting  |
| Workers & material on site                            | Contribution to the economy through employment                                  | Contractual agreement  | Site supervisor   | Invoicing<br>Annual Performance Assessment & Reporting   |
| Workers & material on site                            | Spread of HIV/Aids to farm workers and local community                          | Toolbox talks  | Site supervisor   | Annual Performance Assessment & Reporting  |

| SOURCE ACTIVITY  | IMPACTS REQUIRING MONITORING PROGRAMMES  | FUNCTIONAL REQUIREMENTS FOR MONITORING   | ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES) | MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS |
|--|--|--|---|--|
| Use of heavy machinery & vehicles on site for drilling | Resource consumption (diesel - non-renewable resource)   | Maintenance records  | Site supervisor   | Annual Performance Assessment & Reporting  |
| Use of heavy machinery & vehicles on site for drilling | Contamination of soils through hydrocarbon leaks and spills from machinery & equipment         | Visual checks at storage areas. Material Safety Data Sheets                                  | Site supervisor   | Annual Performance Assessment & Reporting  |
| Use of heavy machinery & vehicles on site for drilling | Use of groundwater for drilling activities   | Specification of drill rig. General Authorisation / WUL                                      | Site supervisor   | Annual Performance Assessment & Reporting  |
| Use of heavy machinery & vehicles on site for drilling | Contamination of surface water through hydrocarbon leaks and spills from machinery & equipment | Visual checks that drill holes are located 60 m from river & streams. Drill grid coordinates | Site supervisor   | Annual Performance Assessment & Reporting  |
| Use of heavy machinery & vehicles on site for drilling | Contamination of groundwater through hydrocarbon leaks and spills from machinery & equipment   | Drip trays, PVC Liners. Material Safety Data Sheets  | Site supervisor   | Annual Performance Assessment & Reporting  |
| Use of heavy machinery & vehicles on site for drilling | Compaction of soils through movement of heavy vehicles and machinery on site                   | Determination of access routes (drill grid). Rehabilitation of drill sites & access routes   | Site supervisor   | Annual Performance Assessment & Reporting<br>Application for Closure Certificate               |
| Use of heavy machinery & vehicles on site for drilling | Damage to vegetation   | Determination of access routes (drill grid). Rehabilitation of drill sites & access routes   | Site supervisor   | Annual Performance Assessment & Reporting<br>Application for Closure Certificate               |
| Use of heavy machinery & vehicles on site for drilling | Release of gaseous emissions   | Maintenance records  | Site supervisor   | Annual Performance Assessment & Reporting  |
| Use of heavy machinery & vehicles on site for drilling | Dust Fallout   | Dust suppression - dry season  | Site supervisor   | Annual Performance Assessment & Reporting  |

| SOURCE ACTIVITY  | IMPACTS REQUIRING MONITORING PROGRAMMES   | FUNCTIONAL REQUIREMENTS FOR MONITORING                              | ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES) | MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS |
|--|---|---|---|--|
| Use of heavy machinery & vehicles on site for drilling | Increase in ambient noise levels  | Complaints register   | Site supervisor   | Annual Performance Assessment & Reporting  |
| Use of heavy machinery & vehicles on site for drilling | Visual intrusion  | Prospecting Work Programme  | Site supervisor   | Annual Performance Assessment & Reporting  |
| Use of heavy machinery & vehicles on site for drilling | Disturbance of fauna species in the vicinity  | Drill equipment - 60mm - 75.7 mm drill rigs. Test pits limited to 6 | Site supervisor   | Annual Performance Assessment & Reporting<br>Application for Closure Certificate               |
| Use of heavy machinery & vehicles on site for drilling | Release of methane gas from exploration boreholes   | Visual checks to ensure capping of boreholes                        | Site supervisor   | Annual Performance Assessment & Reporting<br>Closure Application                               |
| Use of heavy machinery & vehicles on site for drilling | Cross-contamination of aquifers due to borehole construction  | Monitoring records  | Site supervisor   | Annual Performance Assessment & Reporting<br>Closure Application                               |
| Use of heavy machinery & vehicles on site for drilling | Proliferation of invasive plant species   | Works Instruction   | Site supervisor   | Annual Performance Assessment & Reporting<br>Application for Closure Certificate               |
| <b>Closure</b>   |   |   |   |  |
| Concurrent rehabilitation                              | Reducing soil compaction of disturbed area and access roads to improve drainage and control erosion | Visual checks to determine level of rehabilitation                  | Site supervisor   | Annual Performance Assessment & Reporting<br>Application for Closure Certificate               |
| Concurrent rehabilitation                              | Use stockpiled top soil to close sumps and test pits  | Visual checks to determine level of rehabilitation                  | Site supervisor   | Annual Performance Assessment & Reporting<br>Application for Closure Certificate               |
| Close drill hole                                       | Restoration of land use and land capability   | Visual checks to ensure capping of boreholes                        | Site supervisor   | Annual Performance Assessment & Reporting  |

| SOURCE ACTIVITY | IMPACTS REQUIRING MONITORING PROGRAMMES | FUNCTIONAL REQUIREMENTS FOR MONITORING | ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES) | MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS |
|-----------------|---|--|---|--|
|                 |   |  |   | Closure Application  |
|                 |   |  |   |  |

DRAFT



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

A performance assessment on this EMP will be conducted every second year by an external independent auditor and the results of the audit will be provided to the regional manager. An Environmental Audit will be conducted in the alternative year by an independent auditor and the results will be available upon request

**m) Environmental Awareness Plan**

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

All employees will be required to undergo site induction. Additionally daily toolbox talks will be held each morning before the activities for the day are commenced.

The Site Induction training will focus on the following:

- Discussion of environmental impacts as indicated in the Impact Assessment Table (Appendix 4)
- Waste management –The removal of all waste from site to prevent litter
- Water usage – Conservation of water, correlation between water & erosion.
- Driving protocol – Pre-start vehicle checks prior to driving, adhering to speed limits on dirt roads.
- Environmental mitigation – Example no collection of wood, no open fires, no snaring of animals, no unnecessary destruction of vulnerable natural vegetation, clean-up of hydrocarbon spills, etc.
- Emergency procedure – Type of emergencies, type of alarms, emergency equipment, location of assembly point and identification of emergency wardens.

During the daily toolbox talks the following will be discussed:

- Any environmental or health and safety incidents that may have occurred the previous day
- Status of housekeeping on site
- Ad hoc refresher in terms of emergency procedures

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

Please refer to the following:

- Appendix 4 for the Impact Table
- The Table presented above in Part B 1 (d) (iii).

**n) 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

## 2) UNDERTAKING

The EAP herewith confirms

- a) the correctness of the information provided in the reports
- b) the inclusion of comments and inputs from stakeholders and I&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.

*(Draft electronic copy)*

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Signature of the environmental assessment practitioner:

*EcoPartners (Pty) Ltd*

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Name of company:

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Date:23/02/16

**-END-**