mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

# BASIC ASSESSMENT REPORT

# AND

# ENVRIONMENTAL MANAGEMENT PROGRAMME REPORT

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


**NAME OF APPLICANT:** DE BEERS CONSOLIDATED MINES PROPRIETARY LIMITED

TEL NO: (053) 839 4243

FAX NO: (053) 839 4880

POSTAL ADDRESS**:** PO Box 616, Kimberley, 8300

PHYSICAL ADDRESS**:** 36 Stockdale Street, Kimberley, 8300


**FILE REFERENCE NUMBER SAMRAD:** FS 30/5/1/1/2/10430 PR

## 1. IMPORTANT NOTICE

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

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

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

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

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

## 2. Objective of the basic assessment process

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

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

(b) identify the alternatives considered, including the activity, location, and technology alternatives;

(c) describe the need and desirability of the proposed alternatives,

(d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage , and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on the these aspects to determine:

  (i). the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and

  (ii). the degree to which these impacts—

(aa). can be reversed;

(bba). may cause irreplaceable loss of resources; and

(cca). can be managed, avoided or mitigated;

(e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—

(i). identify and motivate a preferred site, activity and technology alternative;

(ii). identify suitable measures to manage, avoid or mitigate identified impacts; and

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

**PART A**
**SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT**

3. Contact Person and correspondence address

**a) Details of:**

**i. Details of the EAP:**


| | |
|---|---|
| Name of the Practitioner: | Theophillus Twarisani Rikhotso |
| Tel No.: | (011) 309 3600 |
| Cell No.: | (071) 959 2602 |
| Fax No.: | (011) 309 3184 |
| e-mail address: | Theophillus.rikhotso@debeersgroup.com |


**ii. Expertise of the EAP**

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

*(with evidence).*

Theophillus T. Rikhotso holds a National Diploma in environmental Science from Tshwane University of Technology including various Environmental Management certificates such as Environmental Law for Environmental Managers, Environmental management system implementations include audits, ecological rehabilitation and mine closure, water quality monitoring and Environmental Impact Assessment: a practical approach.

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

Mr Rikhotso has 7 years of experience in the environmental management field ranging from environmental consulting, both opencast and underground coal mining including diamond exploration. From August 2013 Mr Rikhotso has been involved in the compilation of the De Beers RSA explorations' Environmental Management Programme (EMP) in terms of Prospecting Rights in terms of section 39 and of regulation 52 of the Mineral Petroleum Resource Development Act, 2002 (Act No. 28 of 2002) including Public participation and Environmental Management Programme Report Performance Assessment (EMPR PAR). While working for Anglo American Thermal Coal from 2009 to 2013 he has been involved in the implementation of Environmental Authorization conditions such as Water Use Licence conditions, EMPR conditions and commitments. He was also responsible for the development, implementation and maintenance of Environmental Management Systems for both underground and opencast coal operations. While in consulting in 2008 he has been involved in the compilation of Amendment Application for environmental authorization and drafting Background Information Documents for Gautrain Rapid Rail Link. He drafted the Molopo-Nosob River- Drafting Environmental Status Quo. Grotas - Evaluation of EMP and scoping reports for compliance with legislation. Chobe/Zambezi River- Drafting Newsletters, compilation of EMP for water pipeline which runs between Botswana, Namibia and South Africa. He was organizing Focus Group Meetings for interested and affected parties. Map work- Identification of properties that were not affected by the authorized alignment Gautrain Railway line, but affected by the horizontal and/or vertical re-alignment on plans and

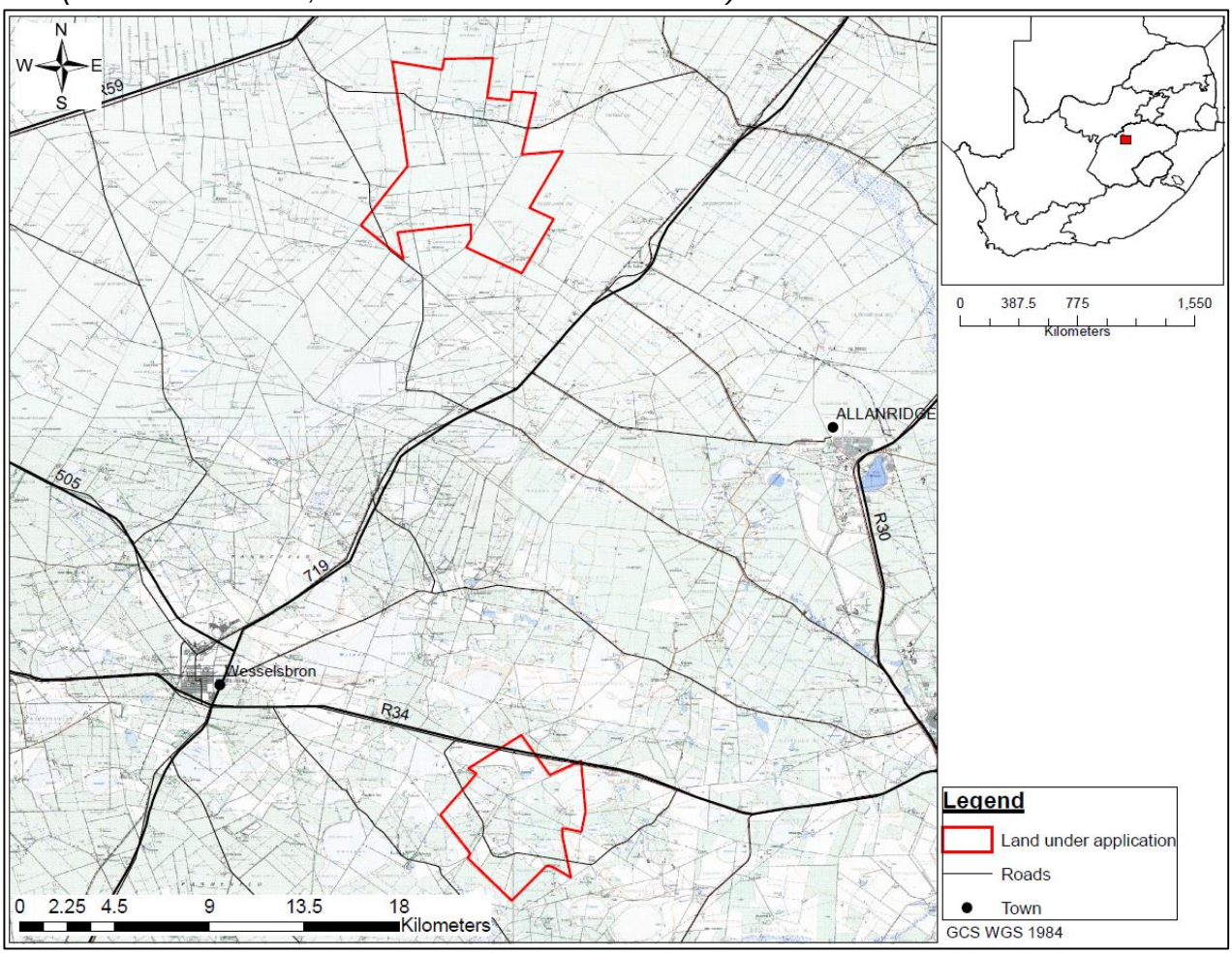
communicate the new impact and mitigation in terms of vibration and noise pollution to landowners.

**b) Location of the overall Activity**

| | |
|---|---|
| **Farm Name:** | Rotterdam 12, Welkom 20, Steenrots 188, Vrolijkheid 200, Welgegund 206, Trianon 218, Mariaspan 223, Steenrots 352, Abelsdam 371, Ado 973, Avondster 937, Ebenhaezer 59, Grootvaderbos 971, Lincoln 38, Middelspruit 1222, Ruiterbos 1223, Rustplaats 252, Sannie's Rust 254, Zamenkomst 270 |
| **Application area (Ha)** | 7811.2674 |
| **Magisterial district:** | Lejwaleputswa |
| **Distance and direction from nearest town** | 11 km east of Wesselsbron and 16 km west of Allanridge |
| **21 digit surveyor General Code for each farm portion** | |

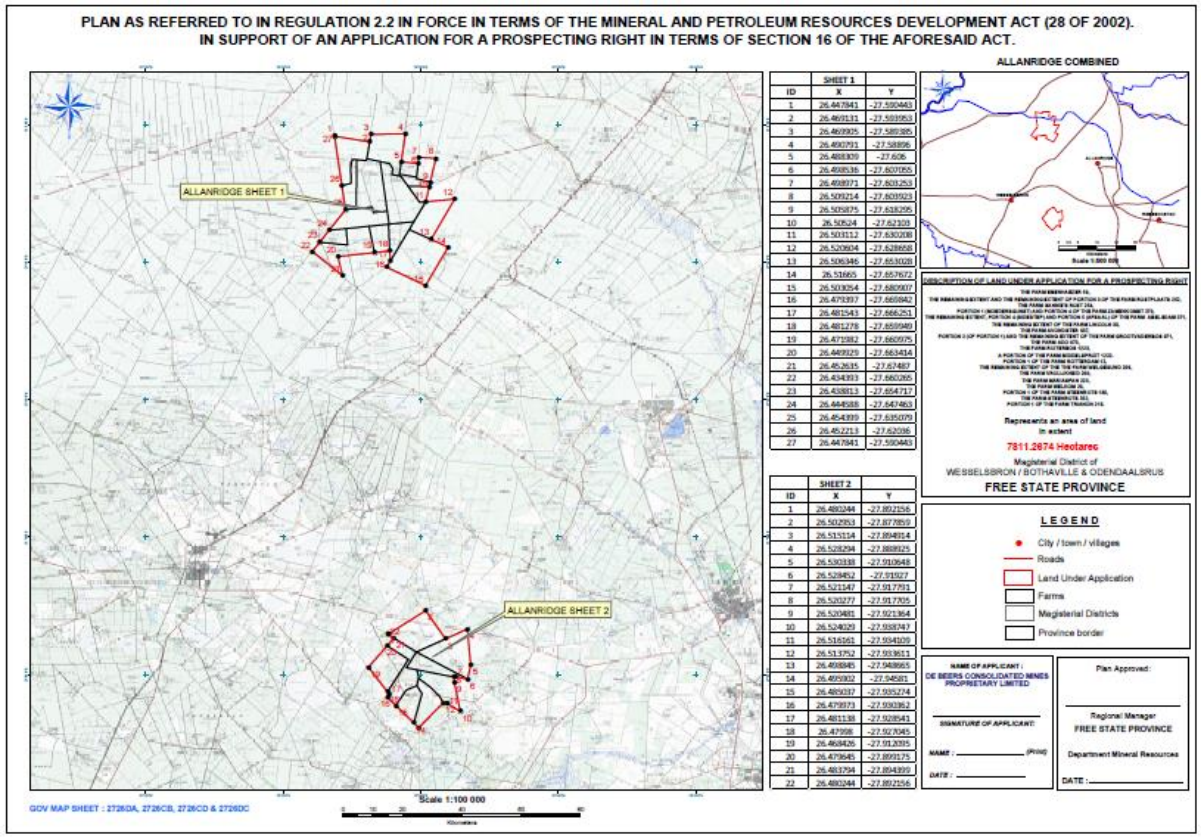
**c) Locality map**

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



**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.*




Prospecting for kimberlite is a dynamic and result-driven operation which proceeds in phases, the outcome of which cannot be predicted or predetermined. The programme could be stopped at any stage during the prospecting operation if the results are negative or non-economical. Prospecting activities to be undertaken include non-invasive (e.g. desktop studies and ground geophysical surveys) and invasive (e.g. drilling) techniques.

The environmental footprint of drilling is limited to less than 0.64 Ha per site, to which two (2) target are anticipated and the activities carried out will only require the clearing of shrubs and grass. It must be noted that no roots of both grass and shrubs to minimise erosion. Consequently the site will rapidly recover following completion of exploration activities.

Drilling water requirements fall within the “small industrial user” where the use of water is less than twenty cubic metres per day for prospecting. Therefore the water that will be used for the prospecting activities will be sourced on agreement from an existing authorized water user which could be either the land owner or local municipality. No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act no. 36 of 1998). Drilling may take a few days to two months to complete per site depending on the geology of the area, technical challenges and other factors.

**(i) Listed and specified activities**

| **NAME OF ACTIVITY** (**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 $m^2$** | **LISTED ACTIVITY Mark with an X where applicable or affected** | **APPLICABLE LISTING NOTICE (GNR 983, GNR 984 or GNR 985)** |
|---|---|---|---|
| Prospecting Right Application | 7811.2674ha | X | GN983, Activity 20 |
| Desktop studies, Further feasibility study investigations and mineral resource estimation | 7811.2674ha | - | Not listed |
| Drilling Programme - incl. Core drilling and Large diameter drilling | 0.64 Ha/site | X | GN983, Activity 20 |
| Water required for drilling * | n/a | - | Not listed |
| Sanitation requirements (Chemical toilets) | n/a | - | Not listed |
| Geological mapping and Geophysical surveying | 100 Ha/site | - | Not listed |

**(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)*

**Overview**

De Beers Consolidated Mines Proprietary Limited (De Beers) has lodged an application for a prospecting right over the properties described above. De Beers proposes to conduct prospecting activities in terms of listing 20 Regulation No. 983 of the Environmental Impact Regulation Listing Notice 1 of 2014.

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**Desktop Studies**

This involves the compilation of all available geological and related information, relevant to prospecting for diamonds hosted in kimberlites, available from both public and commercial sources, for the property. This information is then assessed by the geologist and other specialists (such as a geophysicist) as required, in order to determine the best prospecting techniques to be used in order to discover and subsequently test any kimberlites on the property. Note that this activity is repeated at the end of each phase of prospecting, by the interpretation and integration of new prospecting information with the existing information set, in order to inform a decision on whether further work is warranted and if so, the specific scope of this additional work.

**Ground Geophysical Surveys**

Ground geophysical surveys involve the systematic measurement of magnetic, gravitational and electromagnetic fields over target areas of interest within the property, using appropriate instruments. The individual survey areas vary between 500 x 500 m to 2 x 2 km depending on the inferred size of any target. Magnetic survey lines are spaced at a maximum of 50 m apart and readings will be taken at a minimum of 5 m intervals along the lines. Electromagnetic and gravity survey lines are spaced at a maximum of 100 m apart with readings taken at a maximum of 50 m along the lines. After data collection has been completed, data processing and visualization is carried out to allow the interpretation of the survey.

**Drilling**

Core drilling will be carried out on geophysical anomalies to test for the presence of kimberlite. If kimberlite is discovered, the primary objective for core drilling is for geological logging. The exploration drilling holes may be vertical or inclined, usually at a maximum angle of 60 degrees (from the horizontal). The borehole depth will be determined by the geologist and will depend on the type of anomaly and the geological conditions, including overburden (the thickness of material that overlies the target kimberlite). The maximum depth of such holes is typically 400 meters where the cover is thin, and 600 meters where the cover is thick, and 8 boreholes are anticipated to be drilled per target.

The size of core drilled will be determined by such factors as cost, proposed core sampling, the degree of logging required and proposed geotechnical investigations. Sizes commonly used are HQ (63.5 mm diameter core) and NQ (47.6 mm diameter core) or variations on these. The orientation and depth of core holes will vary depending on the drilling objective. In

the case of delineation drilling, angled core holes will be drilled to establish accurate kimberlite / country rock boundaries at depth (in other words, where the edge of the kimberlite is at depth). Vertical holes will be drilled for geological modelling and / or sampling of the core.

Core holes are also used as pilot holes for large diameter holes. The geological information provided by the core holes greatly reduces the risk of selecting inappropriate Large Diameter Drilling (LDD) hole locations. Core holes allow for maximum control on information such as overburden thickness, density, country rock dilution and likely kimberlite intersections, and therefore allow more accurate determinations of the position of likely Large Diameter Drilling holes for diamond recoveries.

Material derived from i.e. core will be examined on site for logging purposes and sampled for a variety of analyses as described below. Large Diameter Drilling (LDD), currently up to 610 mm diameter, provides good geological and especially grade data. LDD will be conducted when grade assessment is one of the primary objectives of the exercise. The sizes of the boreholes drilled will be determined by such factors as proposed sampling, availability of drilling equipment, cost and the volume of sample required. LDD will take place after pilot core drilling. The pilot hole will also be used as a guide for geological control and sample planning.

**e) Policy and Legislative Context**

| **APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT**<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)* | **REFERENCE WHERE APPLIED** | **HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTECT.**<br>*(e.g. In terms of the National Water Act & Water Use License has / has not been applied for)* |
|---|---|---|
| **Legislation** | | |
| Constitution of South Africa, specifically everyone has a right;<br>a. to an environment that is not harmful to their health or wellbeing; and<br>b. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:<br>i. prevent pollution and ecological degradation;<br>ii. promote conservation; and<br>iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. | Prospecting activities | The prospecting activities shall be conducted in such a manner that significant environmental impacts are avoided, where significant impacts cannot all together avoided be minimised and mitigated in order to protect the environmental right of South Africans. |

| | | |
|---|---|---|
| Minerals and Petroleum Development Resources Act, Act 28 of 2002<br>(MPRDA) section 16 ( as amended) | Prospecting activities | The conditions and requirements attached to the granting of the prospecting right will apply to the prospecting activities. |
| National Environmental Management Act, No 107 of 1998 (as amended) (NEMA) Listing Activity 20 of Listing Notice 1 in terms of Regulation 983 of 2014 | Prospecting activities | The appropriate environmental authorisation will be obtained before proceeding with any prospecting activities.<br>Measures will be implemented to prevent any pollution occurring during the drilling activities.<br>The disturbed area shall be rehabilitated in such a way that is stable, non-polluting, non-eroded, free from alien invasive species and suitable for agreed post closure land use. |
| National Water Act, Act 36 of 1998 (NWA): | N/A | **No water use license is required for this application**.<br>Any water required for drilling activities will be obtained from a legal source within the area or brought in via mobile water tanker. |
| | | Appropriate dust extractions / suppression equipment will be a condition imposed on the drill contractor for their drill rigs. |
| National Environmental Management: Waste Act, Act 59 of 2008<br>(NEMWA)NEM: WA (as amended) | Management measures environmental awareness plan | The generation of potential waste will be minimised through ensuring employees of the drilling contractor are subjected to the appropriate environmental awareness campaign before commencement of drilling.<br>All waste generated during the drilling activities will be disposed of in a responsible legal manner. Proof of legal disposal will be maintained on site. |
| National Heritage Resources Act, 25 of 1999 ("NHRA") | Management measures | Phase 1 Heritage Impact Assessment shall be conducted prior to drilling to ensure that significant impacts on heritage artefacts, heritage site and graves. No drilling activities will take place with 50m of any identified heritage |

| | | |
|---|---|---|
| | | resource such as a grave. |
| **Municipal Plans and Policies** | | |
| Lejwaleputswa | | Used to identify relevant socio-economic background information as well as spatial development information |
| **Standards, Guidance and Spatial Tools** | | |
| BGIS (www.bgis.sanbi.org) | Baseline environmental description | Used during desktop research to identify sensitive environments within the prospecting rights area. |
| SANS 10103:2008 The Measurement and Rating of Environmental Noise with Respect to Land Use, Health, Annoyance and to Speech Communication | Management / monitoring measures | Used to set the standard allowable for noise generation and control during drilling. |
| SANS 1929:2005 Edition 1.1 – Ambient Air Quality Limits for Common Pollutants | Management / monitoring measures | Used to set the standard for dust generation and control during drilling. |

**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 aim of the prospecting activities is to locate and evaluate diamond deposits hosted in, or locally derived from kimberlite, which as an igneous rock can in theory be found within any other older host rocks. As the peak ages of kimberlite intrusion in central South Africa were at roughly 120 Million Years Ago (Ma) and 90 Ma, any rocks older than these dates can host kimberlites. In addition it has been well established that diamonds are most commonly present in economic concentrations in kimberlites found within cratonic regions and related tectonic blocks.

The area applied for falls within the Kaapvaal Craton and thus has the generic potential to host diamondiferous kimberlites. Numerous kimberlites, including the diamond alluvial fields, are thus found in quite close proximity to the area applied for.

Kimberlites are known to occur in clusters, and hence the reason for applying for these prospecting activities as it occurs in close proximity to known diamond mines, e.g. Lace Mine. Prospecting activities are therefore needed to:

1. Confirm and obtain additional information concerning potential targets through non-invasive activities (e.g. desktop studies and ground geophysical surveys) and invasive (e.g. drilling) activities.
2. Assess if the resource can be extracted through future mining in an environmentally socially and economically viable manner.

Should prospecting activities prove that there are feasible minerals to allow for mining, a new mine may be developed which would generate extensive employment opportunities in an area where employment is needed.

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

Kimberlites typically occur as clusters within larger kimberlite fields. The area applied for is located within close proximity to known diamond mines, e.g. Lace mine, which is therefore considered highly prospective.

Geophysical methods and follow-up drilling have been proven very useful in detecting potential kimberlite targets and they will therefore be used to identify optimal locations of potential bodies of economic interest within the prospecting area.

**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;*
(f) *the option of not implementing the activity*.

**(a) the property on which or location where it is proposed to undertake the activity;**

Until such time that the non-invasive activities have been completed the exact location of the drill sites cannot be confirmed. However the following buffers will be applied to the final site selection:

- No drill site will be positioned within 500m of a structure.
- No drill site will be positioned within 100m of a water course or wetland.
- Where possible existing access roads will be utilised to access the drill sites.

**(b) the type of activity to be undertaken;**

In terms of the technologies proposed, these have been chosen based on the long term success of the company in terms of their prospecting history. The prospecting activities proposed in the Prospecting Works Programme is dependent on the preceding phase as previously discussed; therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

**(c) the design or layout of the activity;**

Alternative site layout is considered to ensure that resting place and ablution facilities are located away from the drilling activities to minimise the noise impacts. Site establishment are done with closure in mind to ensure that only the required size is disturbed.

Due to the location of the proposed drilling (close proximity to built-up areas, such as towns), no camp site will be required. The drilling contractor can make use of existing accommodation in the nearby town.

**(d) the technology to be used in the activity;**

The method and techniques employed for the investigation of potential targets and deposits are suitable for the proposed prospecting activities.

**(e) the operational aspects of the activity;**

Alternative time frames can be made to ensure that the impact on the day to day running of the inherent land use are minimise for example drilling on cultivated land can be rescheduled post harvesting. Prospecting activities will be conducted during daylight hours to minimize exposure to the risks. If necessary certain drill sites can be timed to occur during school terms or holidays as may be required in certain instances by stakeholders. The time of implementing drilling activities during the course of the day may also be reconsidered in consultation with landowners. Ideally drill activities will occur continuously until such time that a hole is completed. If necessary certain holes can be drilled for a 12 hour day, with no drilling occurring during the night.

**(f) the option of not implementing the activity.**

Drilling is required in order to investigate the potential and feasibility of a resource as well as being used to generate a SAMREC compliant mineral resource statement. There is no potential for any future investment in a mine without the confirmation of the mineral resources which can only be obtained from drilling activities.

Should the prospecting right be refused, effectively a potential diamond resource will be sterilised.

The socio-economic benefit and most notably the future employment potential of a mine development will also be lost if the prospecting activities are not implemented in order to determine the feasibility of any diamondiferous deposit that may occur within the area.

**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 following steps will be undertaken as part of the public participation process in order to notify interested and affected parties:

a. Potential I&APs will be identified through the use of an existing I&AP databases. The existing databases include landowners, neighbouring landowners, community

members and non-governmental organisations (NGOs) who have participated in previous EIA processes in the area.

b. Potential I&APs will be notified about the project by means of:

i. Letters of notification to directly affected landowners;

ii. Media advertisements and site notices; and

iii. Written notifications to other stakeholders including Local and District Municipalities (including tribal authorities where applicable).

c. Newspaper advertisements will be placed in the relevant regional and/or local newspapers to inform stakeholders of commencement of the BA process and invite the registration as stakeholders.

d. I&APs will have the opportunity to review and comment on the Draft Basic Assessment Report. Focus group meetings may be held the key stakeholders in the local area

e. I&APs will be notified of the environmental authorisation, once received and the appeal process to be followed.

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

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

| **Interested and Affected Parties**<br><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** |
|---|---|---|---|---|---|
| **AFFECTED PARTIES** | | | | | |
| **Landowner/s** | **X** | | | | |
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| **Lawful occupier/s of the land** | **X** | | | | |
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| **Landowners or lawful occupies on adjacent properties** | | | | | |
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| **Municipal Councillor** | X | | | | |
| **Municipality** | X | | | | |
| Organs of state (Responsible for infrastructure that may be affected Roads Department, **Eskom. Telkom, DWA.** | | | | | |
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| **Communities** | | | | | |
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| **Dept. Environmental Affairs** | | | | | |
| | | | | | |
| **Other Competent Authorities affected** | | | | | |
| | | | | | |
| | | | | | |
| **<u>OTHER AFFECTED PARTIES</u>** | | | | | |
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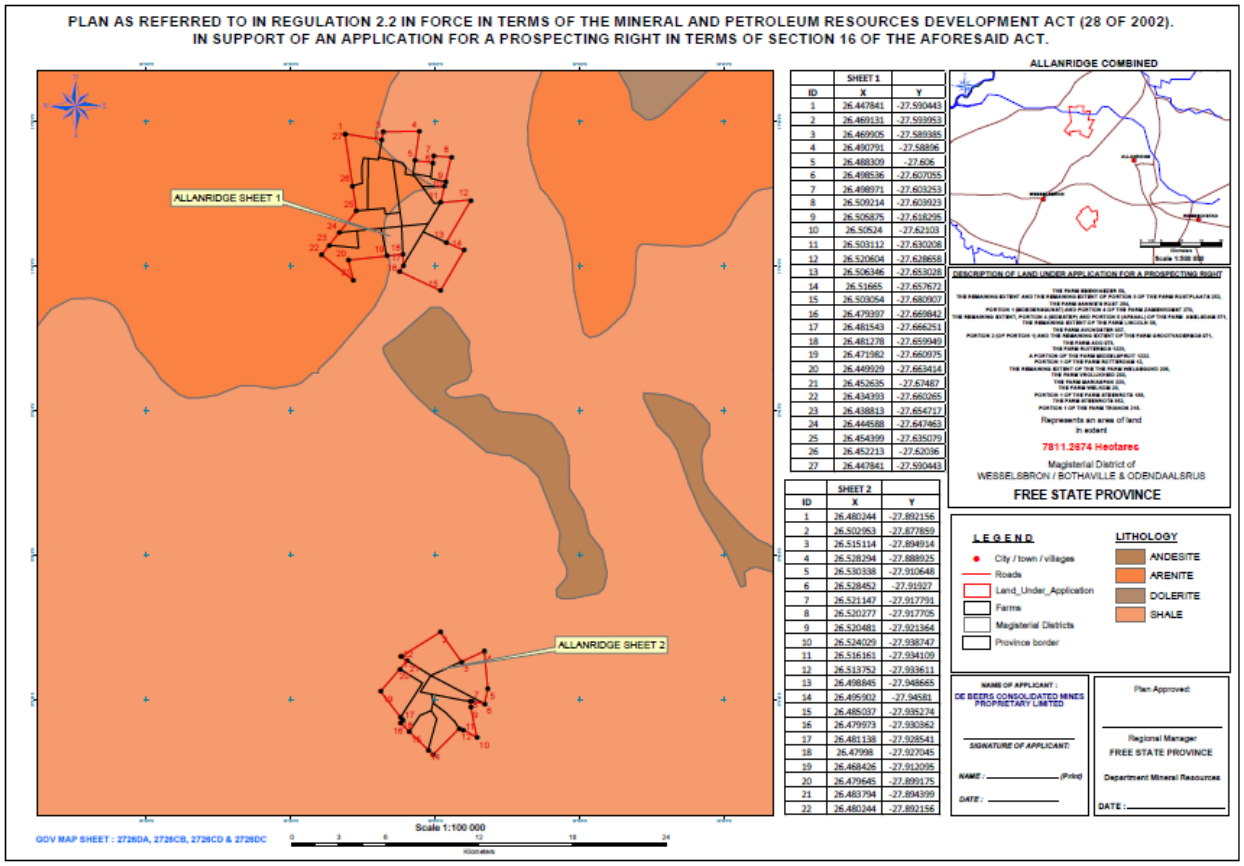
**iv) The Environmental attributes associated with the alternatives** *(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)*

**(1) Baseline Environment**

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

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

**Geology**

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| 7 | 26.521147 | -27.917791 |
| 8 | 26.520277 | -27.917705 |
| 9 | 26.520481 | -27.921364 |
| 10 | 26.524029 | -27.938747 |
| 11 | 26.516161 | -27.934109 |
| 12 | 26.513752 | -27.933611 |
| 13 | 26.498845 | -27.948665 |
| 14 | 26.495902 | -27.94581 |
| 15 | 26.485037 | -27.935274 |
| 16 | 26.479973 | -27.930362 |
| 17 | 26.481138 | -27.928541 |
| 18 | 26.47998 | -27.927045 |
| 19 | 26.468426 | -27.912095 |
| 20 | 26.479645 | -27.899175 |
| 21 | 26.483794 | -27.894399 |
| 22 | 26.480244 | -27.892156 |

The specific area applied for is underlain by andesites of the Allanridge Formation of the Ventersdorp Supergroup. The andesites are overlain by shale and arenites of the Ecca Group. Dolerite dykes, probably of Late Karoo age, intrude these basement rocks.

(The above plan is attached in larger format under **Appendix D**).

**Topography**

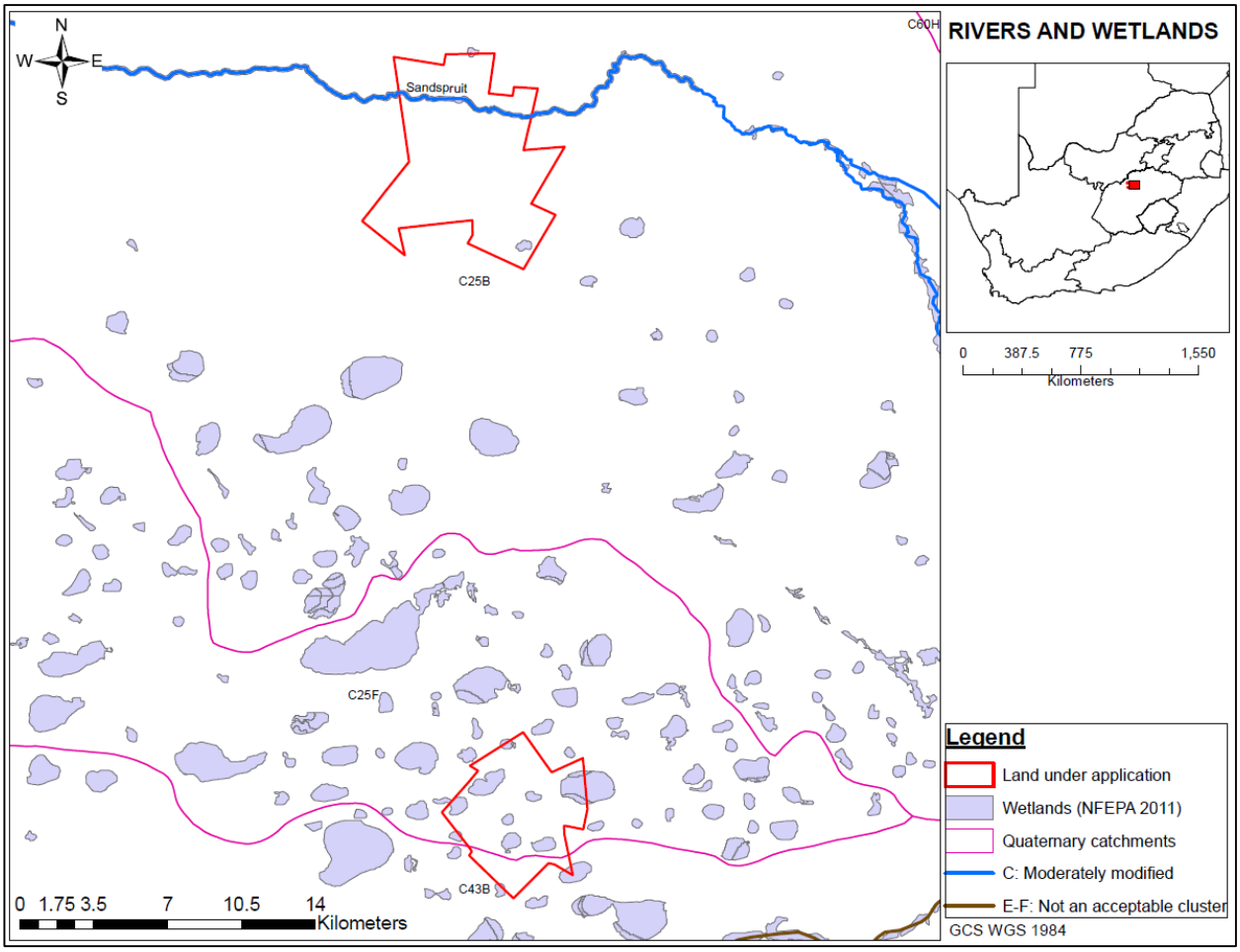
The Free State area is characterised by flat lying lowlands, with the series of dolerite koppies and ridges. The general area is relatively flat, at an average elevation of between 1300m and 1530m above sea level (Refer to 1:50,000 topographic map sheets 2726DA, CB, CD and DC).

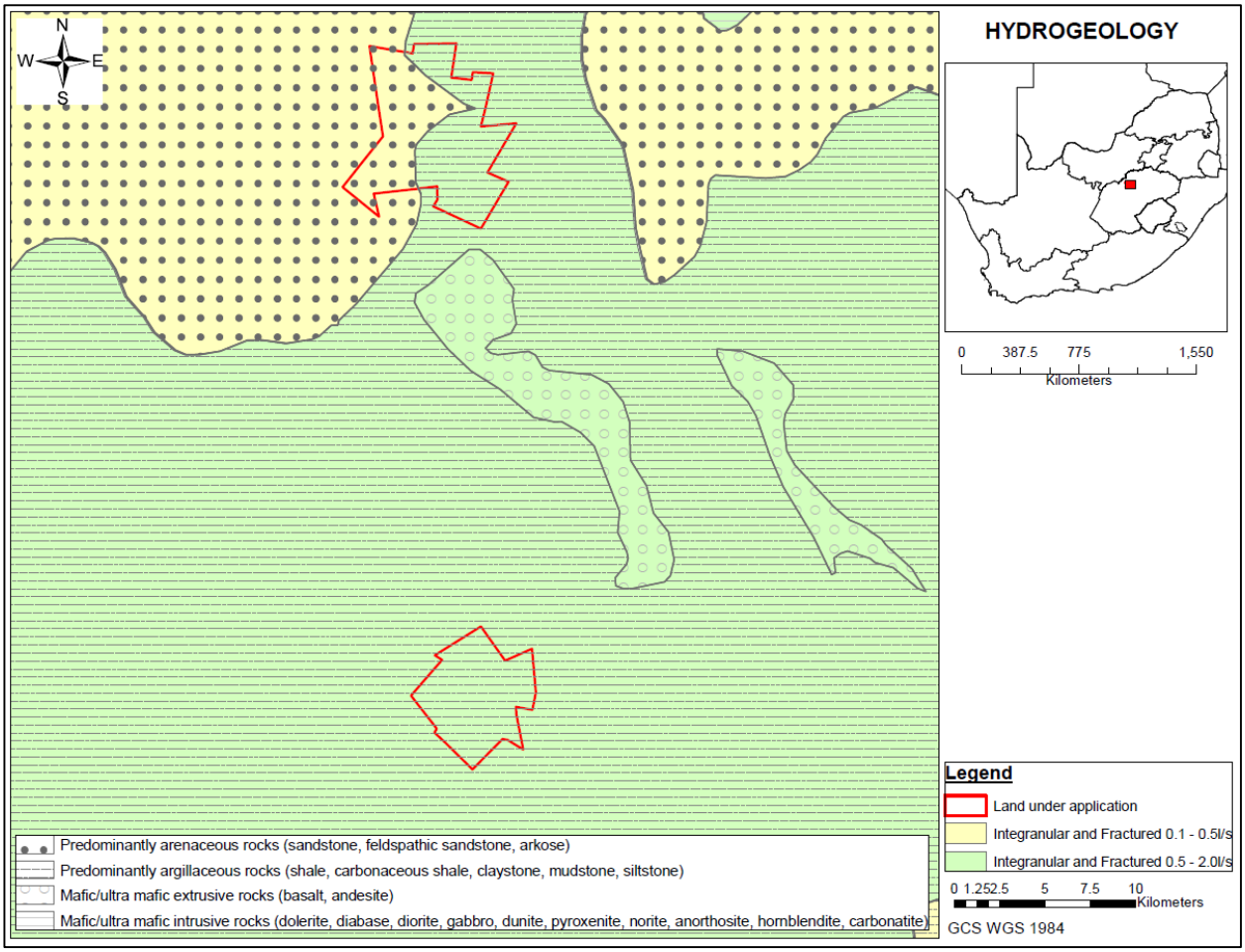
**Climate**

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

**Water Resources**

The proposed prospecting license areas are situated within the region of the Sandspruit River, which is a moderately modified river system (class C), and falls within the Quaternary Catchment Area C25B, C25F and C43B. There are quite a few notable dams and natural wetlands in proximity to the area of interest.

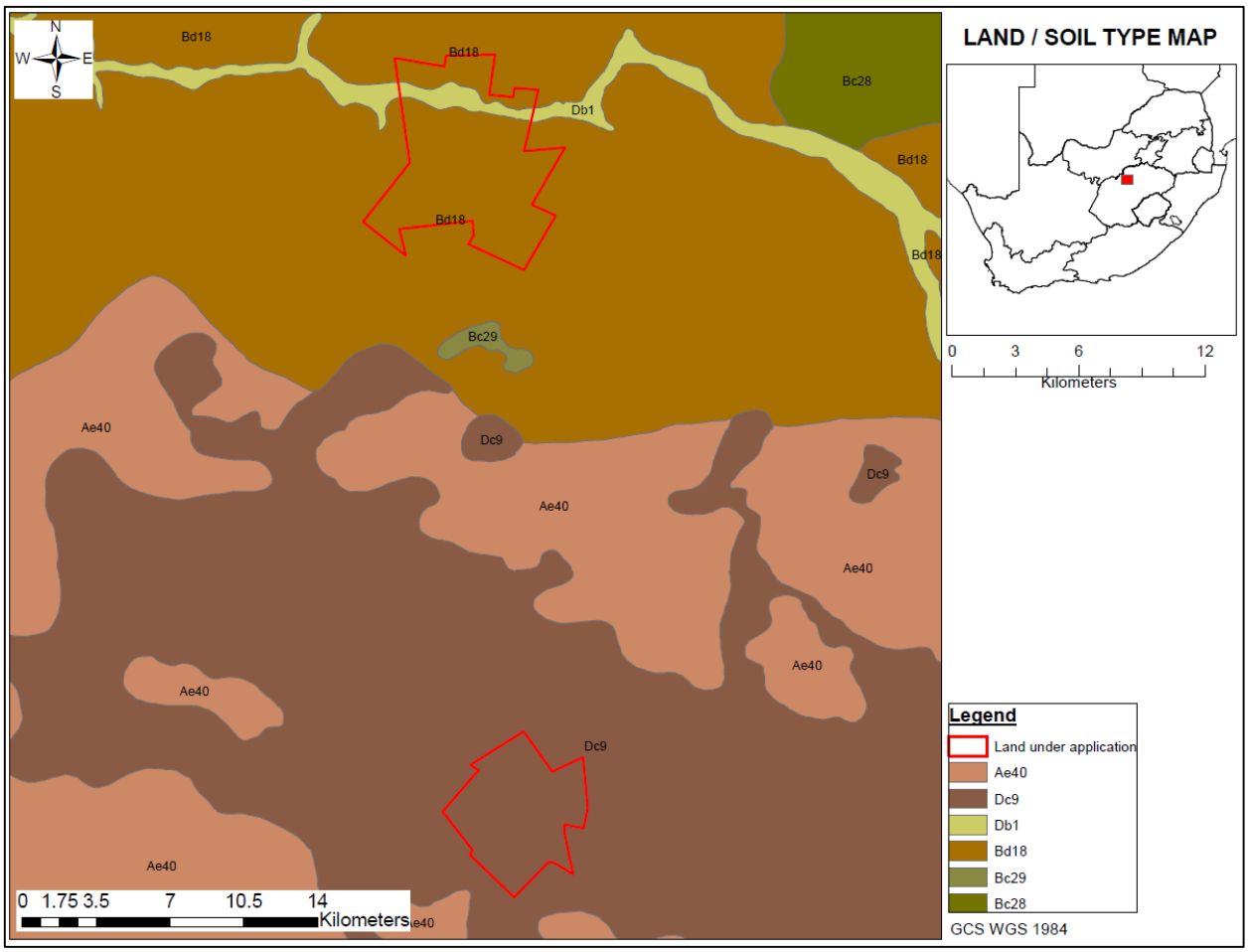




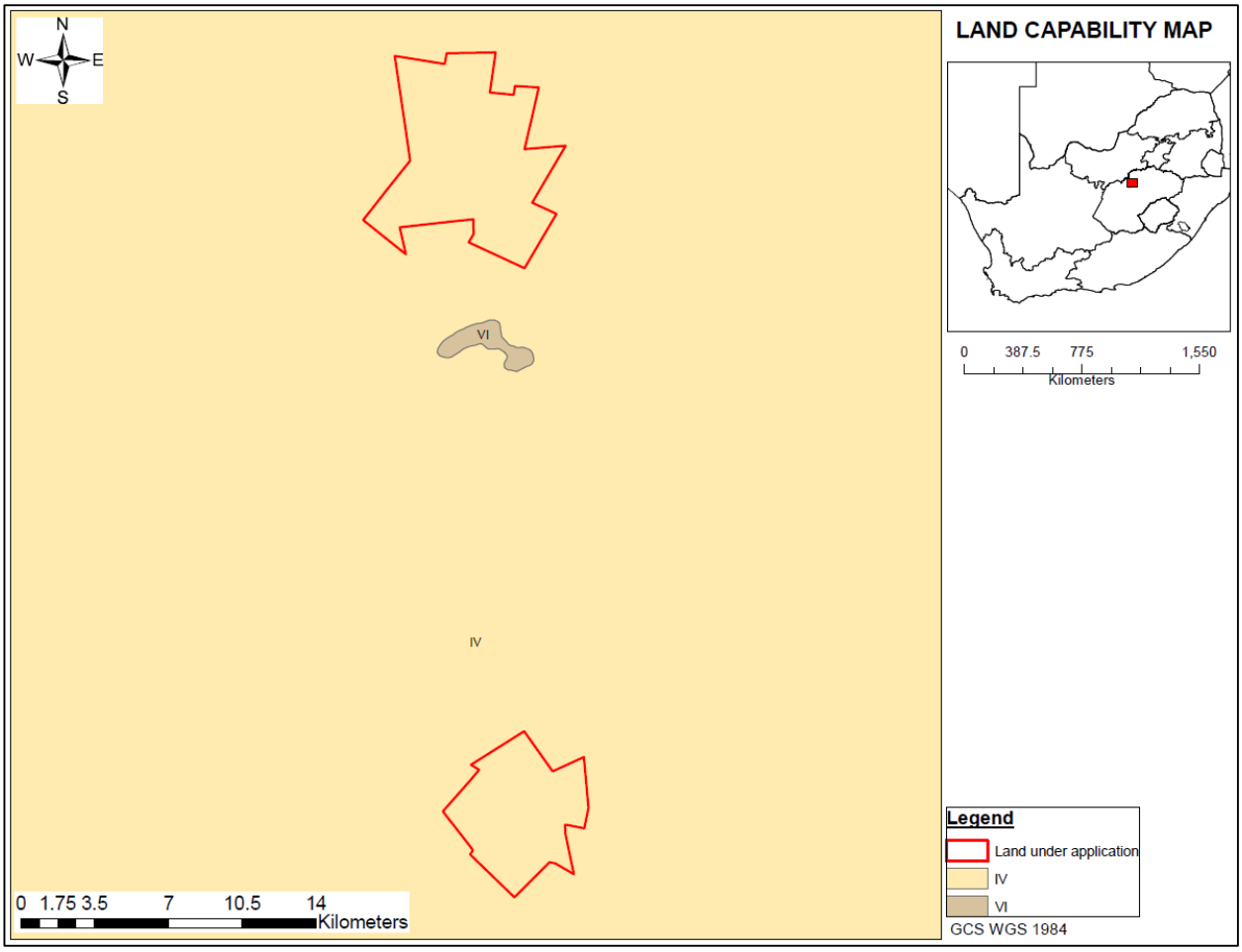

The area under application is underlain by intergranular and fractured lithology, of mafic and ultramafic extensive rocks, e.g. dolerites as well as arenaceous and argillaceous rocks such as sandstone, mudstone and shales.

**Soil and land capability**

The soil for the area which is applied for are comprised of three types of Prismacutanic soils which are horizon B dominated and contributed by Ecca sandstones, mudstones and shale with some dolerite (Db1, Bc28 and Dc9). There are two types of Plinthic red soils, contributed by Ecca sandstone, mudstone, shales, dolerite and calcrete (Bd18) and andesitic or basaltic lavas of the Ventersdorp Supergroup (Bc29). The final soil type is a red-yellow apedal soil of >300mm depth contributed by Ecca sandstone and mudstone.



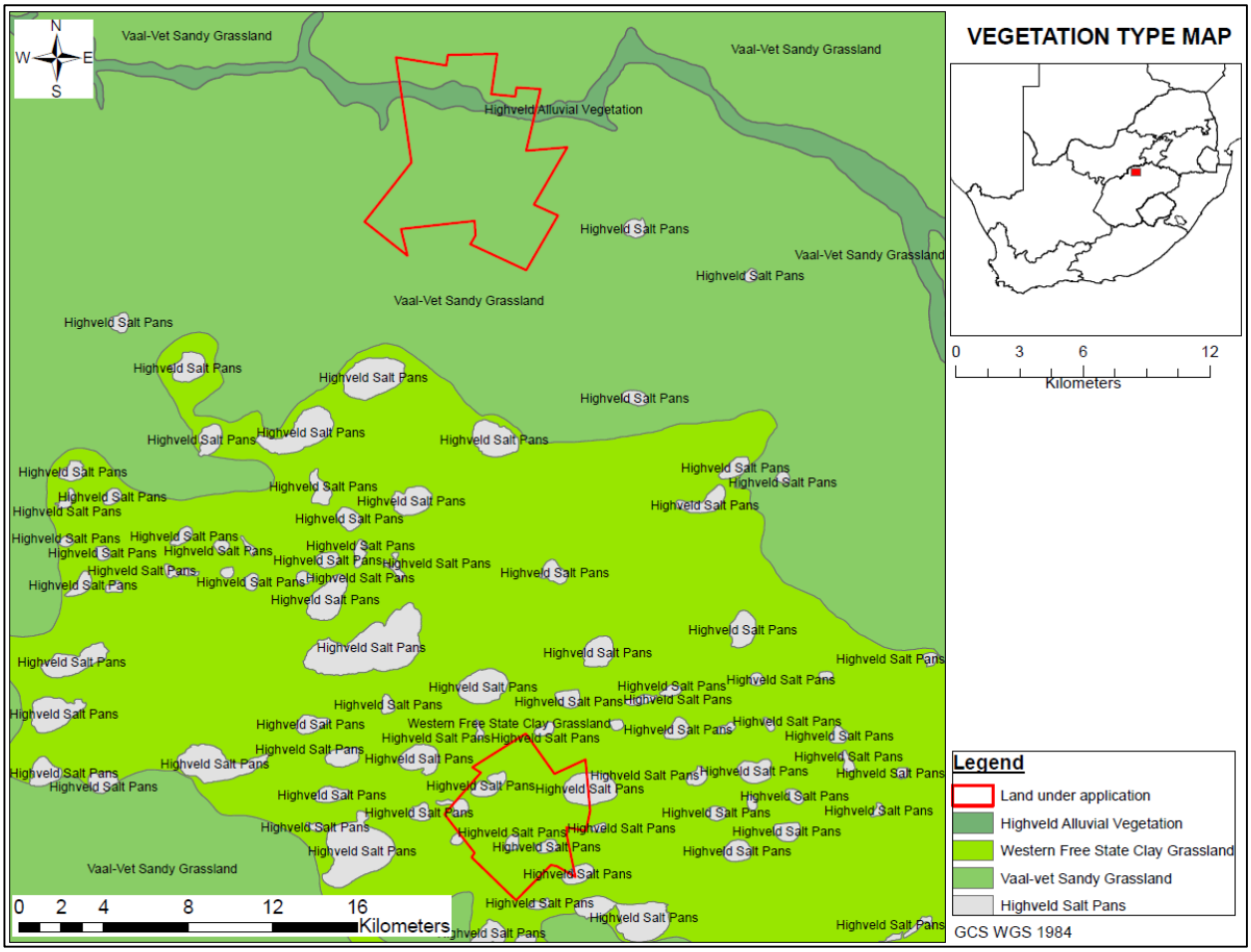

The area is mostly used for livestock grazing, with the largest part of the land under application characterised as arable with severe restrictions to vegetation growth and are limited for grazing purposes (IV) and some woodlands and wilderness areas (VI) The Land Capability map is provided below.



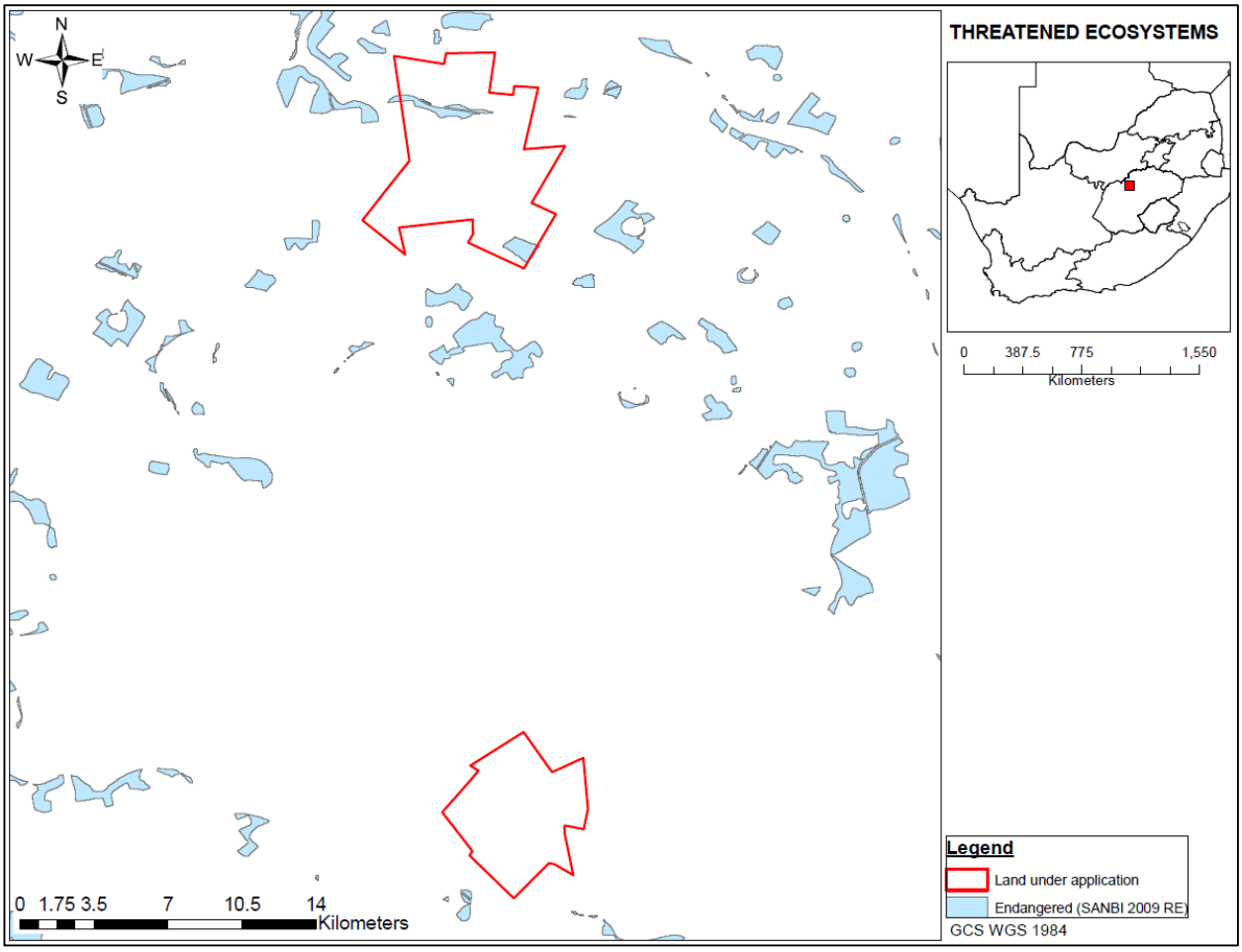

**Biodiversity**

The proposed prospecting area falls within the Grassland Biome and mainly consists of the Western Free State Clay Grassland (Gh9) and the Vaal-vet Sandy Grassland (Gh10). The area is also within the Azonal Vegetation Biome with Highveld Salt pans (AZi10) and the Highveld Alluvial Vegetation (AZa5).

The Grassland Biome vegetation (Gh10) is considered as endangered, with 0.3% statutorily being conserved in the Bloemhof Dam, and Soetdoring Nature Reserves, while the Azonal Vegetation Biome vegetation (AZi10 and AZa5) are the least threatened with conservation targets at 24%.




Although portions of each of the proposed prospecting areas may be transformed by cultivation, large areas remain untransformed and relatively undisturbed comprising natural habitat that is important in maintaining local flora and fauna communities and ecosystem processes. The area under application is situated within an endangered ecosystem which forms part of the Grassland Biome (Mucina and Rutherford's, 2006). Critical Biodiversity Areas and threatened ecosystems are shown in the figure below.




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

| Species category | English name | Scientific name | Reporting rate (%) |
|---|---|---|---|
| Critically endangered | Bittern | Botaurus stellaris | 6-12 |
| | Wattled Crane | Bugeranus carunculatus | 2-6 |
| Endangered | Saddlebilled Stork | Ephippiorhynchus senegalensis | 2-18 |
| | Bearded Vulture | Gypaetus barbatus | < 2 |
| | Botha's Lark | Spizocorys fringillaris | > 25 |
| Vulnerable | Pinkbacked Pelican | Pelecanus rufescens | < 2 |
| | Bald Ibis | Geronticus calvus | 2-29 |
| | Cape Vulture | Gyps coprotheres | 8-20 |
| | African Whitebacked Vulture | Gyps africanus | 2-18 |
| | Tawny Eagle | Aquila rapax | 2-13 |
| | Martial Eagle | Polemaetus bellicosus | 7-17 |
| | African Marsh Harrier | Circus ranivorus | 2-11 |
| | Lesser Kestrel | Falco naumanni | > 17 |
| | Blue Crane | Anthropoides paradiseus | > 22 |
| | Grey Crowned Crane | Balearica regulorum | 2-10 |
| | Kori Bustard | Ardeotis kori | 14-28 |
| | Ludwig's Bustard | Neotis ludwigii | > 25 |
| | Grass Owl | Tyto capensis | > 6 |

**Socio-economic**

The proposed prospecting area is located in the Matjhabeng and Nala Local Municipalities, which are two of five local municipalities within the Lejweleputswa District Municipality. The total extent of the Matjhabeng local Municipality is 515 548 ha, while Nala is 412270ha. The population, according to the 2011 community census is 406 461 and 81,220, with an average density of 0.79 and 0.20 persons per Ha for Matjabeng and Nala Local Municipalities respectively. This low distribution is due to the large underdeveloped area in the Free State Province. The population percentage living on farms is 2.26%, compared to the 97.7% living in urban areas.

The table below shows the population distribution per age break down for both the Lejweleputswa District Municipality and the Matjhabeng Local Municipalities.

| Age structure (Years) | Population percentage (%) | | |
|---|---|---|---|
| | Lejweleputswa District Municipality | Matjhabeng Local Municipality | Nala Local Municipality |
| Under 15 | 28.90% | 27.30% | 32.7% |
| 15 to 64 | 66.10% | 68.10% | 61.6% |
| Over 65 | 5.00% | 4.70% | 5.8% |
| Total population | 627 626 | 404 461 | 81,220 |

The population size for the 15 to 65 age group is greater in the Matjhabeng Local Municipality than the Lejweleputswa District Municipality, while for Nala Local Municipality is lower. Nala local municipality has the highest population form both under 15 and over 65 than both Matjhabeng local municipality and the district municipality while Matjhabeng local municipality has the lowest of the three. There are 98.3 and 91.80 males per 100 females in Matjhabeng and Nala respectively. The population growth rate, according to the 2011 census was -0.46% per annum in the Lejweleputswa District Municipality, -0.04% in the Matjhabeng Local Municipality and -1.9% in Nala Local Municipality, this could mainly be contributed by the large undeveloped land area.

**Economic active population and economic sectors**

The unemployment rate is 37% and 35.9%, with youth unemployment being 49.7% and 47.6% between the ages of 15 and 34 years for Matjhabeng and Nala respectively. The main economic sectors in the Matjhabeng Local Municipality are agriculture at 34.91% and mining at 40.51%. while the main economic activity for Nala Local Municipality is agriculture as it forms part of the “Maize triangle of South Africa. From 2001 to 2011 the average household income of less than R3500 per annum reduced by 2.66%, and the household income of R3500 to R12801 per annum grew by 9.84%, 16.09% have no income for the Matjhabeng. Approximately 12% of the Nala local Municipality has no income with about 5% earning less than 4800 and approximately 48% earning between R9 601 and R76 400 per annum.

**Education and literacy levels**

The Matjhabeng Local District literacy is characterised by a large population of 37% who are considered literate, with their education ranging from some secondary schooling to higher education level, i.e. matric. A further 4.6% have no schooling. 7.5% of the population of Nala Local Municipality has no education with about 5.7% with only high school and 22.2% with only metric.

**Health**

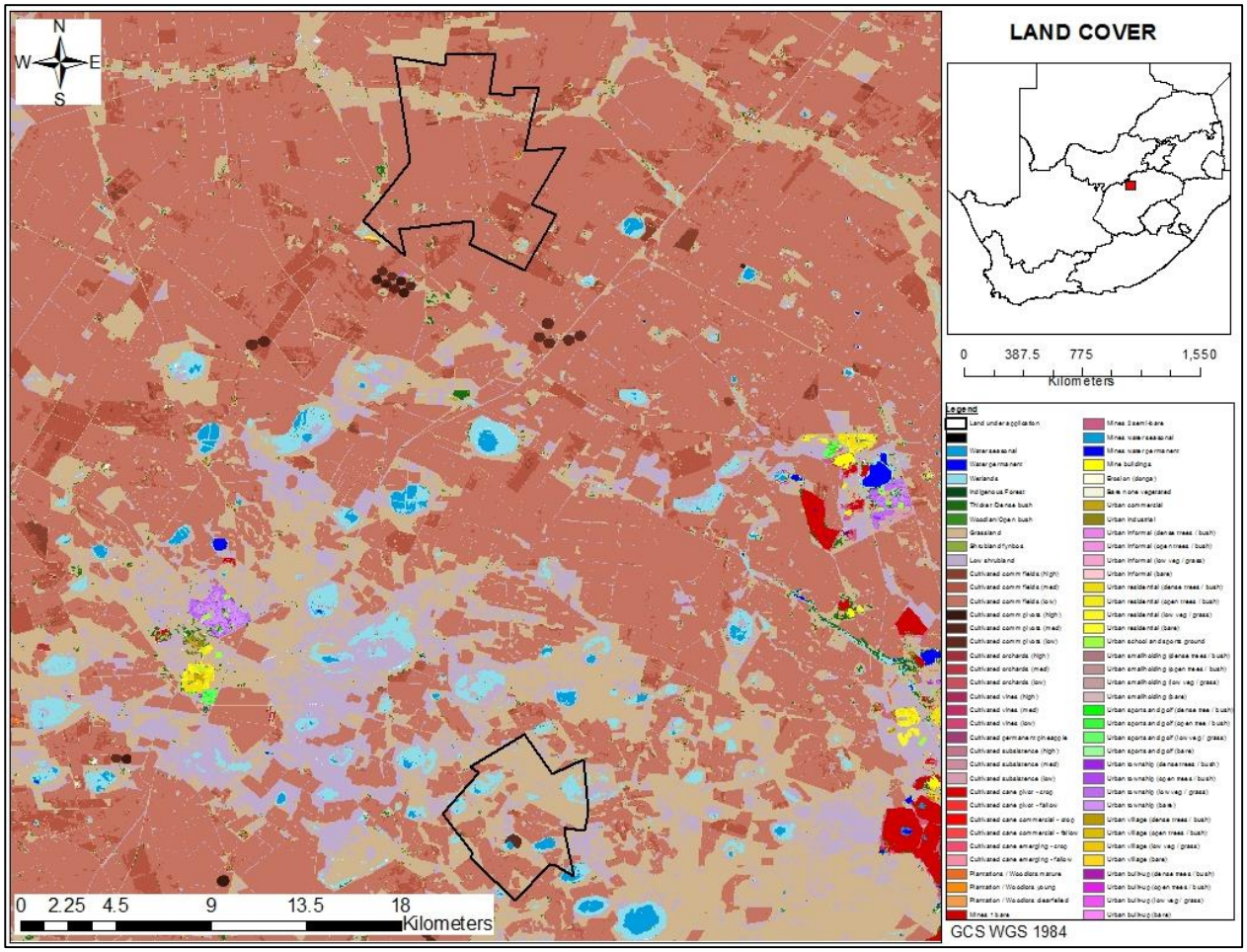
The South African population is negatively affected by HIV/AIDS; and poses some serious problems to the economic development. The importance of knowing the prevalence cannot be over emphasised. The Matjhabeng Local District has the second highest HIV infection rate in the country and Nala Local Municipality also has higher HIV prevalence.

**Cultural Heritage**

The sub-region is rich in heritage attributes relating back to the stone-age. Sites dating to the historic period can be related to early farming, infrastructure development, mining, industries and towns. These also include sites of conflict, e.g. dating to the Anglo-Boer War, cemeteries, etc. The importance of the above and other identified cultural heritage, archaeological site and artefacts cannot be over emphasised in order to ensure that they are preserved for current and future generations and for tourism. The area under application is not in close proximity to any cultural heritage sites.

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

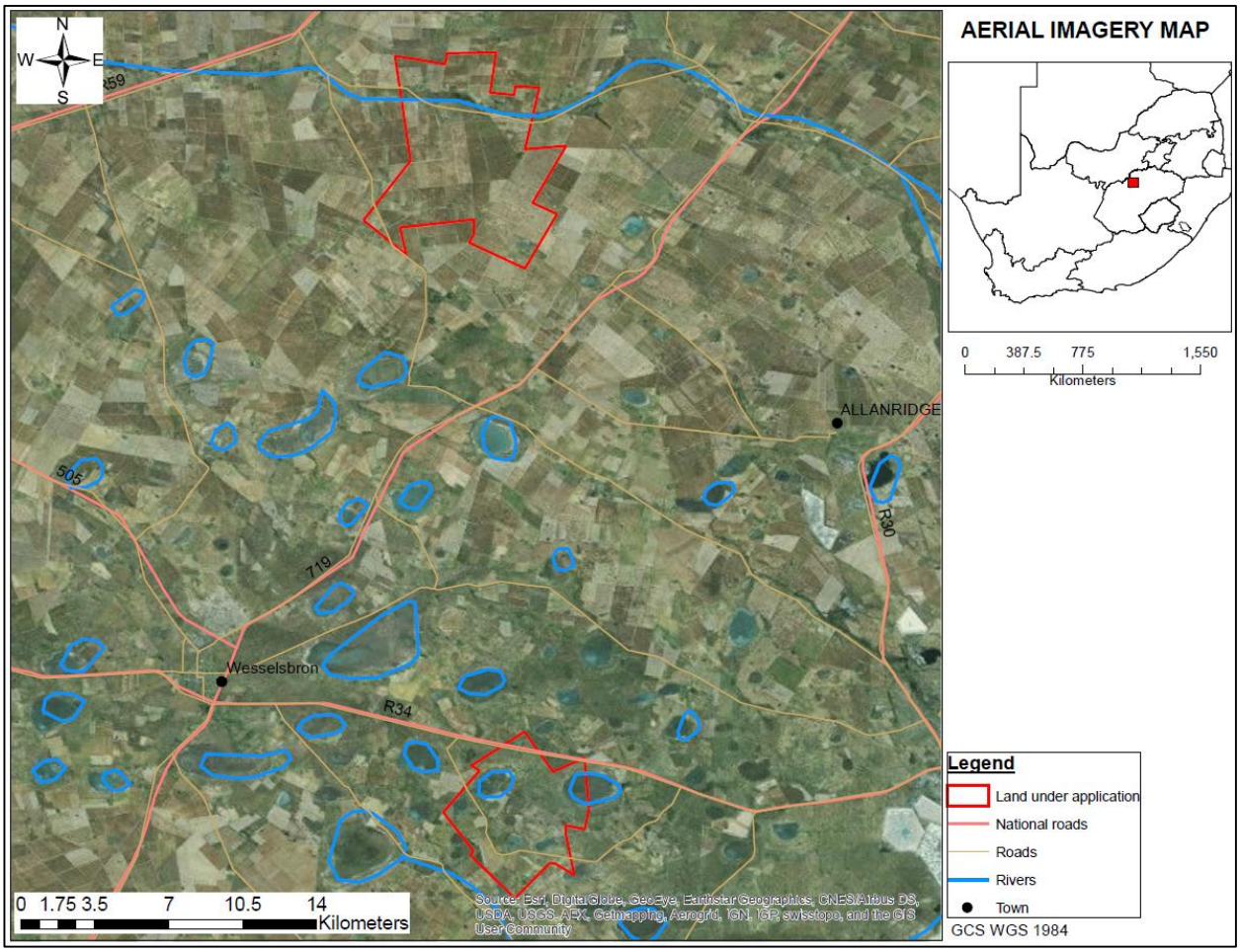
The land cover and uses associated with the proposed prospecting license area is shown in map below. The proposed prospecting right area is dominated by low shrubland and grassland, with minor woodlands / open bush, thicket / dense bush and cultivated fields. There are also areas of urban villages and townships, with low vegetation and grass, as well as urban school sports grounds. The area of interest is in close proximity to mining associated activities.




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

The Sandspruit is within the area of the proposed prospecting rights application areas, which is classified as class C-moderately modified river. Impacts on this river and other water sources should be appropriately managed and remedied. Based on the outcomes of the initial prospecting phases (non-invasive activities), the location of any invasive activities such as drilling will be determined and the impacts on the identified water courses will subsequently be determined. The area also contains a number of trees and thicket stands, which should also be avoided as far as possible. It is expected that for the invasive activities (drilling), that only localised clearing of grass and shrubs are required in order to prepare a drill pad.

A number of urban villages and townships, as well as farmstead dwellings, outbuildings and other farm infrastructure occur in the area and these will be avoided as far as possible. The area also has a number of national and secondary roads and farm tracks that traverse the site. The invasive activities will seek to use existing roads and tracks in order to access properties where needed, it is not expected that any new access roads will be opened up. The map below gives an overview of the sites and the main watercourses, settlements and roads that traverse the site.




**(d) Environmental and current land use map**

*(Show all environmental and current land use features)*

Please refer to the Land Cover Map shown under section "(b) Description of the current land uses. "

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

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

The potential environmental and social impacts include:

- ✓ Noise caused by the drilling rig travelling to and being established on each site, the diesel engine driving the drill, vehicles going to and from the drilling site.
- ✓ Visibility of the drilling rig;
- ✓ Dust generated by the drilling operation and vehicles travelling over unpaved areas;
- ✓ Disturbance of soil from drill pad preparation and compaction;

- ✓ Disturbance of flora and fauna
- ✓ Disturbance or damage to cultural and heritage resources such as graves or historic ruins;
- ✓ Potential contamination of soil, surface water and groundwater with hydrocarbons;
- ✓ Friction between local residents/landowners and prospecting personnel;
- ✓ If drilling is undertaken close to any residence, lodge, guest house or game farm, receptors may experience the noise, the visual appearance, the associated traffic and the presence of the drilling crew on the property as intrusive;
- ✓ It is not anticipated that the prospecting activities will have any lasting material effects on existing land uses on the prospecting areas or any other areas in their vicinity.

**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).*

Please refer to Impact Assessment Methodology described below.

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

The majority of the prospecting activities are non-invasive and hence will have limited environmental and social impact. The invasive activities that entail the drilling of approximately 4 exploration holes will have a minimal environmental and social impact as each drill site will be confined to an area of approximately 0.64 hectares. 2 drill sites are anticipated with total footprint of 1.28 ha, which need to be viewed in the context of the entire prospecting license area under application which covers 7811.2674 hectares.

All of the identified impacts will occur for a limited time and the extent of the impacts will be localised. All of the identified impacts can be suitably mitigated with the residual impact ratings being of ***low*** significance. After drilling activities have been completed and the drill pads rehabilitated to pre-drilling status, the impacts will cease to exist.

**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).*

Please refer to Impact Assessment Methodology described below.

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

As discussed in previous sections, the proposed prospecting right area is targeted as, historically, several kimberlite occurrences in the areas are known as well as historic diamond

mining activities. The proposed prospecting license area is therefore regarded as the preferred site and alternative site have not been considered.

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

As discussed in previous sections, each of the prospecting phases is dependant in the results of the preceding phase. The location and layout of drill sites will be determined based on information derived from the desktop and geophysical surveys (non-invasive activities). Proposed drill sites will be selected so as to avoid known heritage sites, water courses, dwellings and infrastructure where practicable.

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

**Environmental Impact Assessment (EIA) Methodology:**

**5x5 Risk Matrices**
5x5 Risk Matrix is a systematic methodology that has been adopted to evaluate the risk of each respective impacts/unwanted event. The risk of each impacts/unwanted events is determined for Safety, health and Environment.

The fundamental principle of Risk Matrices is to recognise that it is simply a tool to prioritise risks and the actions required to manage the risk to an acceptable level. It is a risk ranking tool that provides a qualitative means to determine the significance of risks and the required effort to address priorities in addressing the risk.

A minimum of two factors are considered for each risk identified:

- **Likelihood**: chance/probability that the risk will occur within a time period
  The definition of likelihood provides time based frequency guideline for evaluating risks associated with (repeat) events on a 5 point scale.

- **Consequence**: The impact the risk will have, should it materialise
  Given the types of headline risks that the Family of Companies encounters, the consequences/ impact of these risks are categorised across the following areas:
  - Environmental
  - Legal
  - Social /community
  - Reputational

*Note: The risk are categorised into low, medium, significance and high. Anglo American has adopted a ranking approach from 1 to 25, meaning there are unique Risk Numbers for each risk rated:*
Low: 1 -5: Medium: 6 to 12: Significant: 12 to 20 and High: 21 to 25

Note: When rating significance of environmental aspects the duration and extent of impact must be taken into consideration as follows:

- For Pollution impacts – Toxicity, Volume and nature of the substance in question.
- For habitat disturbance – sensitivity of the habitat, the size of the area affected and the ability of the environment to rehabilitate (Assimilative capacity).
- For biodiversity impact – red data rating of the species and the range of the species.
- For resource use – amount of resource used, resource availability and whether it is renewable or not.

| Impact | | | | 1 – Insignificant | 2 - Minor | 3 - Moderate | 4- Significant | 5 - High |
|---|---|---|---|---|---|---|---|---|
| Environmental | | | | Lasting days or less; affecting small area (metres); receiving environmental highly altered with no sensitive habitats and no biodiversity value (e.g. urban/ industrial areas) | Lasting weeks; affecting limited area (hundreds of metres); receiving environment altered with little natural habitat and low diversity value | Lasting months; affected extended area (kilometres); receiving environment comprising largely natural habitat and moderate biodiversity value | Lasting years; affecting area on sub-basin scale; receiving environment classified as having sensitive natural habitat with high biodiversity value | Permanent impact; affecting area on a whole basin or regional scale; receiving environment classified as highly sensitive natural habitat with very high biodiversity value |
| Legal & Regulatory | | | | Technical non compliance. No warning received; no regulatory reporting required | Breach of regulatory requirements. Report/ involvement of authority. Attracts administrative fine | Minor breach of law; report/ investigation by authority. Attracts compensation/ penalties/ enforcement action | Breach of the law, may attract criminal prosecution, penalties/ enforcement action. Individual licence temporary revoked. | Significant breach of the law. Individual or company law suits; permit to operate substantially modified or withdrawn |
| Social/ Communities | | | | Minor disturbance of culture/ social structures | Some impacts on local population, mostly repairable. Single stakeholder complaint in reporting period | On going social issues. Isolated complaints from community/ members/ stakeholders | Significant social impacts. Organised community protests threatening continuity of operations | Major widespread social impacts. Community reaction affecting business continuity. "License to operate" under jeopardy |
| Reputation | | | | Minor impact – public awareness may exist but no public concern | Limited impact – concern/ complaints from certain groups/ organizations (e.g. NGO's) | Local impact, public concern/ adverse publicity localised within neighboring communities | Suspected reputational damage; local/ regional public concern and reactions | Noticeable reputational damage – national/ international public attention and repercussions |
| | | | | Risk Rating | | | | |
| Likelihood/Probability | 5 Almost Certain | 99% | The unwanted event has occurred frequently; occurs in order of 1 or more x per year & is likely to reoccur within 1 year | 11 (M) | 16 (S) | 20 (S) | 23(H) | 25 (H) |
| | 4 Likely | 60% | The unwanted event has occurred infrequently; occurs in order of less than 1 x per year & is likely to reoccur within 3 years | 7 (M) | 12 (M) | 17 (S) | 21(H) | 24 (H) |
| | 3 Possible | 30% | The unwanted event has happened in the business at some time; or could happen within 10 years | 4 (L) | 8 (M) | 13 (S) | 18(S) | 22(H) |
| | 2 Unlikely | 15% | The unwanted event has happened in the business at some time; or could happen in 30 years | 2 (L) | 5 (L) | 9 (M) | 14(S) | 19(S) |
| | 1 Rare | 7.5% | The unwanted event has never been known to occur in the business; or it is highly unlikely that it will occur within 30 years | 1 (L) | 3 (L) | 6 (M) | 10(M) | 15(S) |

**Environmental Impact Assessment (EIA):**

As described earlier in this report, the prospecting activities will comprise of desktop and geophysical activities (non-invasive) and dependant on the outcome of these phases, targets will be established for drilling activities (invasive). The impact assessment therefore focuses only on the invasive aspects (drilling and associated activities) as these will have the potential to impact on the biophysical and social environment.

The impact assessment is furthermore separated into two distinct phases, namely:

- ✓ Site establishment; and
- ✓ Operational phase.
- ✓ Decommissioning

**Site Establishment**

- **Cultural and Heritage Resources**

  This stage entails clearing a maximum of 0.64ha per site to cater for the drill rig setup including associated equipment. The total anticipated area for this proposed prospecting application is 1.28 ha. It must be noted that work to date, demonstrated that approximately 25% of the targets will require testing through drilling. This activity has the potential to impact on heritage artefacts, heritage sites and grave yards. The impacts could potentially be **significant (13(S)).** The following mitigation measures will be implemented to reduce the potential impact to ***low (5(L)***:

  - ✓ Heritage Impact Assessment shall be conducted by an independent competent specialist prior the drilling site establishment. This will ensure that all impacts on artefacts, heritage sites and graveyards in order to establish and implement mitigation measure to avoid significant impacts, where such significant impact cannot be avoided be minimised and mitigated.
  - ✓ All De Beers and contractor personnel involved in the construction activities will be made aware of the locations of all identified heritage resources, the necessity of avoiding impacts on such resources and the penalties for damaging them (once drill sites have been identified, these sites will be screened by a qualified archaeologist/cultural heritage specialist);
  - ✓ Personnel will be informed about the consequences of unlawful removal of cultural and historical remains and artefacts associated with heritage sites. It will be emphasised that archaeological artefacts such as potsherds, stone tools, grinding stones, etc. must be left in situ and undisturbed;
  - ✓ A safe distance of at least 50 metres will be maintained between the identified heritage resource and the construction activities. The heritage feature should be cordoned off with stakes and Chevron tape; and
  - ✓ If any heritage resources are discovered as a result of the construction/set-up activities, such activities will cease with immediate effect and a qualified archaeologist will be commissioned to assess their significance and determine appropriate mitigation measures. This may include obtaining authorisation (permits) from SAHRA to conduct mitigation measures if any heritage resources have been affected. Authorisation must be obtained from SAHRA before any mitigation measures are implemented.

- **Noise**

  Typical noise levels generated by various types of construction equipment are listed in Table 6. Conservative attenuation conditions, related to intervening ground conditions and screening, have been applied.

**Table 1: Typical noise levels generated by construction equipment**

| Equipment | Typical operational Noise level at given offset (dBA) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 5m | 10m | 25m | 50m | 100m | 250m | 500m | 100M |
| **Air compressor** | 91 | 85 | 77 | 71 | 65 | 57 | 51 | 46 |
| **Crane (mobile)** | 93 | 87 | 79 | 73 | 67 | 59 | 53 | 47 |
| **Dozer** | 95 | 89 | 81 | 75 | 69 | 61 | 55 | 49 |
| **Pump** | 86 | 80 | 72 | 66 | 60 | 52 | 46 | 40 |
| **Rock Drill** | 108 | 102 | 94 | 88 | 82 | 74 | 68 | 62 |
| **Trucks** | 87 | 81 | 73 | 67 | 64 | 60 | 57 | 54 |

In South Africa, the noise impact on human receptors is evaluated in terms of the SANS 10103 guidelines for sound pressure levels as listed in 7.

**Table 2: Noise level standards for various districts**

| Type of District | Equivalent continuous rating level $L_{Req.T}$ for ambient noise - dBA | | | | | |
|---|---|---|---|---|---|---|
| | Outdoors | | | Indoors with windows open | | |
| | Day-night | Daytime | Night | Day- | Daytime | Night- |
| Rural districts | 45 | 45 | 35 | 35 | 35 | 25 |
| Suburban district | 50 | 50 | 40 | 40 | 40 | 30 |
| Urban traffic | 55 | 55 | 45 | 45 | 45 | 35 |
| Urban districts | 60 | 60 | 50 | 50 | 50 | 40 |
| Central business district | 65 | 65 | 55 | 55 | 55 | 45 |
| Industrial district | 70 | 70 | 60 | 60 | 60 | 50 |

Daytime and night-time refer to the hours from 06h00 to 22h00 and 22h00 to 06h00 respectively.

Taking into account the existing background noise levels of the general area which is rural in nature, the significance of the noise caused by the drilling rig travelling to and being established on each site, vehicles going to and from each drilling site and the voices of the construction crew, the impact is assessed as being ***Low (4(l))*** significance before mitigation. Although mitigation measure are put in place the significance rating remains the same at low ***(4(l))*** significance by limiting the site establishment activities to daylight hours (06h00 to 18h00) and not undertaking such activities at all on Sundays and public holidays, as well as by applying a separation distance of a minimum 500m, but preferably 1000m between drill sites and any dwellings. The vehicles on site are limited to three LDVs and one water truck. It must be noted that the speed limit for driving within a community and prospecting right shall be limited to 60Km/h.

- **Visual**

  The visual impact of the construction / setup activities is assessed as being of ***Significant (16(S))*** significance before mitigation. The impact can be reduced to one of ***medium (12(M))*** significance by taking into account available vegetation screening, the locations of

visual receptors on the prospecting areas and adjacent properties and locating the drilling rig in a way that it is screened from points of visual reception wherever possible.

- **Dust fall**
  Acceptable dust fall rates In terms of the National Dust Control Regulations (GN R. 827 of 1 November 2013) are presented in Table 8. In terms of these regulations, the local air quality officer may prescribe a dust fall monitoring programme, the implementation of dust control measures and continuous ambient air quality monitoring for $PM_{10}$.

**Table 3: Acceptable dust fall rates**

| Restriction Areas | Dust fall rate (D) (mg/m$^2$/Day, 30-day average) | Permitted frequency of exceeding dust fall rate |
|---|---|---|
| Residential area | D < 600 | Two within a year, not sequential months |
| Non-residential area | 600 < D < 1 200 | Two within a year, not sequential months |

The method to be used for measuring dust fall rate and the guideline for locating sampling points shall be ASTM D1739: 1970, or equivalent method.

It is important to note that people experience dust deposition as a nuisance effect, and that there are no direct human health implications because the dust is not inhaled. Heavy dust deposition can have detrimental effects on plants if the leaves are smothered to the extent where transpiration and photosynthesis are affected.

The proposed operation falls within the boundaries of the Bojanala Platinum and Ngaka Modiri Molema District Municipality's and De Beers may be required to operate within the air quality requirements of the Municipality's Air Quality Management Plan.

The impact of dust generation by vehicles travelling over unpaved areas is assessed as being of ***medium (8(M))*** significance before mitigation. The impact can be reduced to one of ***low (2(l))*** significance by wet suppression and enforcement of low vehicle speeds.

- **Soil and vegetation disturbance**
  The impact in areas where drilling (drill pad clearing and compaction) is to be done is assessed as being of ***medium (8(M))*** significance before mitigation. The impact can be reduced to one of ***low (5(L))*** significance by limiting the activities and clearance to the smallest area that is necessary and rehabilitating the disturbed area as soon as possible. Furthermore, that no clear scraping (dozing) be carried out unless absolutely necessary to establish a level drill pad. Rather that surface vegetation be cleared to make way for the drilling rig leaving the roots intact so that vegetation can coppice and regrow.

- **Soil, surface water and groundwater contamination**
  The impact of contamination with hydrocarbons is assessed as being of ***medium (12(M))*** significance before mitigation. The impact can be reduced to one of ***low (5(L))*** significance by keeping a spill kit on site, ensuring proper maintenance of vehicles, taking appropriate care during refuelling and immediate clean-up of any spillages.

- **Conflict between local residents/landowners and construction personnel**

The prospecting sites are located in a rural farming area with farm dwellings and some tourist accommodation such as game lodges. Some landowners cherish the peaceful and quiet lifestyle of the area and friction between local residents and a crew of strangers is very possible. The potential for conflict is assessed as being of ***high (22(H)) significance***, but it can be reduced to one of ***significant (18(S))*** significance by taking appropriate social management measures as set out further below in this section.

**Operational phase**

- **Cultural and Heritage Resources**

  Drilling shall only be conducted on the target in which the heritage impact assessment was conducted and measure to mitigate implemented and therefore the impact could be of ***low (4(L))*** significance. The significant rating will remain the same after mitigation measures at ***low (4(L).***

  - ✓ Drilling equipment moving on site will, where ever possible, be confined to established roads and tracks. Where this is not possible, access routes will be walked prior to entry of equipment to ensure that there are no graves present. Should graves be identified, the access route will be realigned to avoid such heritage resources, which will then be clearly marked with stakes and Chevron tape to minimise risk of accidental damage.
  - ✓ Efforts to achieve satisfactory prospecting results will employ appropriate methodologies aimed at the protection and conservation of heritage resources;
  - ✓ All De Beers and contractor personnel involved in the prospecting activities will be made aware of the locations of all identified heritage resources, the necessity of avoiding impacts on such resources and the penalties for damaging them;
  - ✓ Personnel will be informed about the consequences of unlawful removal of cultural and historical remains and artefacts associated with heritage sites. It will be emphasised that archaeological artefacts such as potsherds, stone tools, grinding stones, etc. must be left in situ and undisturbed.
  - ✓ A safe distance of at least 50 metres will be maintained between the identified heritage resource and drilling rig or any other infrastructure associated with the prospecting activities; and
  - ✓ Where necessary, directional drilling will be practised to assess ore reserves situated below identified heritage resources, without affecting such resources;
  - ✓ If any heritage resources are discovered as a result of the prospecting activities, such activities will cease with immediate effect and a qualified archaeologist will be commissioned to assess their significance and determine appropriate mitigation measures. This may include obtaining authorisation from SAHRA to conduct mitigation measures if any heritage resources have been affected. Authorisation must be obtained from SAHRA before any mitigation measures are implemented.

- **Noise**

  The noise impact caused by the operation of the drilling rig, vehicles travelling to and from each drilling site and the voices of the drilling crew is assessed as being of ***medium (8(M))*** significance. The impact can be reduced to one of ***low (4(L))*** significance by limiting the prospecting activities to daylight hours (07h00 to 18h00) and not undertaking such activities at all on Sundays and public holidays. Furthermore, a separation distance of minimum 500m, but preferably 1000m should be maintained between drill sites and dwellings as far as possible.

- **Visual**
  The visual impact of the prospecting activities is assessed as being of ***Significant (16(S))*** significance. It can be reduced to one of ***medium (12(M))*** significance by appropriate location of the drilling rig as described above for the construction/setup phase.

- **Dust fall**
  The impact of dust generated by the drilling operation and vehicles travelling over unpaved areas is assessed as being of ***Medium (8(M))*** significance, but it can be readily mitigated to one of ***low (2(L))*** significance by wet suppression and enforcement of low vehicle speeds, as well as by applying a separation distance of a minimum 500m, but preferably 1000m between drill sites and any dwellings.

- **Disturbance of soil and vegetation**
  Disturbance of soil and vegetation in areas where trenching is done is rated as being of ***Low (5(L))*** significance. The impact can be reduced to one of ***low (2(L))*** significance by prior delineation of the drill site area via geophysical characterisation and drilling in order to minimise the area that needs to be cleared. Furthermore, that no clear scraping (dozing) be carried out unless absolutely necessary to establish a level drill pad. Rather that surface vegetation be cleared to make way for the drilling rig leaving the roots intact so that vegetation can coppice and regrow.

- **Soil, surface water and groundwater contamination**
  The potential contamination of soil, surface water and groundwater with hydrocarbons is assessed as an impact of ***Medium (8(M))*** significance. The impact can be reduced to one of ***low (5(L))*** significance by implementing the measures recommended for the construction phase. Drilling muds will contained in lined drill sumps and this material will be removed from site and disposed in a licensed disposal facility.

- **Friction between local residents/landowners and construction personnel**
  The potential for conflict between local residents/landowners and prospecting personnel is assessed as being of ***High (22(H))*** significance, but it can be reduced to one of ***High (18(S))*** significance by taking appropriate social management measures – see Table 6 below. **Decommissioning phase**: Decommissioning of borehole sites will take place immediately after each borehole has been completed and the drilling rig is moved to the next site.

**Assessment of potential cumulative impacts**

The cumulative impact assessment considers a scenario where more than one drilling rig and drill site is in operation at any point in time throughout the duration of the prospecting programme.

- The cumulative noise impact of the proposed prospecting operations on the above sensitive receptors is assessed as being of ***significant (17(S))*** significance before mitigation. The impact can be reduced to one of ***Medium (8(M))*** significance by limiting the construction / setup activities to daylight hours (06h00 to 18h00) and not undertaking such activities at all on Sundays and public holidays;

- The cumulative visual impact on the above sensitive receptors is assessed as being of ***Significant (16(S))*** significance prior to mitigation;
- Without mitigation, the potential cumulative impact of dust generation on the above sensitive receptors is assessed as being of ***Medium (8(M))*** significance;
- A total of 2 boreholes are anticipated to be drilled within the proposed prospecting target with the footprint of 0.64 ha per borehole. This combined footprint area would total a maximum of 1.28 hectares at the end of the prospecting programme once all holes have been drilled and then rehabilitated, this needs to be considered in the context of the entire proposed prospecting right area of more than 7811.2674 hectares. It must be noted that work to date, demonstrated that approximately 25% of the targets will require testing through drilling and therefore total area to be used for financial guarantee is 1.28 ha. In the event that the success exceeds expectations/assumptions, the financial guarantee will be reviewed annually and variation in the planned work programme will be revised in line with Section 102 of the MPRDA.
- Without mitigation, the potential cumulative impact of soil, surface water and groundwater contamination, as experienced by the sensitive receptors, is assessed as being of ***medium (8(M))*** significance.

**Proposed mitigation measures to minimise adverse impacts**

- **List of actions, activities, or processes that have sufficiently significant impacts to require mitigation**

Although none of the unmitigated impacts have been assessed as being of ***high (above 21(H))*** significance, the following potential impacts do require mitigation:

- Once drill sites have been identified, these sites will be screened by a qualified archaeologist/cultural heritage specialist in order to identify any cultural/heritage features;
- Generation of noise near residential areas, lodges and guest houses must be avoided to ensure a lack of intrusive noise levels and compliance with the standards for rural areas as indicated in Table 7;
- Establishment of the drill sites or exploration camp in areas that are visually exposed when near residential areas, lodges and guest houses;
- Dust fall, particularly near residential areas, lodges, guest houses and growing crops;
- Disturbance of soil and vegetation – at all the prospecting drill sites (once drill sites have been identified, then an ecology screening survey will need to be undertaken in order to identify any red data/species of concern that need to be avoided);
- Contamination of soil, surface water and groundwater – at all the prospecting drill sites; and
- Friction between local residents and prospecting / drilling contractor personnel.

**Concomitant list of appropriate technical or management options**

The following mitigation measures will be implemented:

- **Cultural and heritage**
  - ✓ Once drill sites have been identified, these sites will be screened by a qualified archaeologist/cultural heritage specialist in order to identify any cultural/heritage features;
  - ✓ Efforts to achieve satisfactory prospecting results will employ appropriate methodologies aimed at the protection and conservation of heritage resources;
  - ✓ All De Beers and contractor personnel involved in the prospecting activities will be made aware of the locations of all identified heritage resources, the necessity of avoiding impacts on such resources and the penalties for damaging them;
  - ✓ Personnel will be informed about the consequences of unlawful removal of cultural and historical remains and artefacts associated with heritage sites. It will be emphasised that archaeological artefacts such as potsherds, stone tools, grinding stones, etc. must be left in situ and undisturbed;
  - ✓ A safe distance of at least 50 metres will be maintained between the identified heritage resource and drilling rig or any other infrastructure associated with the prospecting activities;
  - ✓ Where necessary, directional drilling will be practised to assess ore reserves situated below identified heritage resources, without affecting such resources;
  - ✓ If any heritage resources are discovered as a result of the prospecting activities, such activities will cease with immediate effect and a qualified archaeologist will be commissioned to assess their significance and determine appropriate mitigation measures. This may include obtaining authorisation (permits) from SAHRA to conduct mitigation measures if any heritage resources have been affected. Authorisation must be obtained from SAHRA before any mitigation measures are implemented.

  Diligent implementation of the above measures is expected to reduce the potential impacts from a ***significant (13 (S))*** significance to a ***low (5(L))*** significance.

- **Noise**
  - ✓ Construction/setup, operational and decommissioning activities will be limited to daylight hours (07h00 to 18h00) on Mondays to Saturdays and will not be undertaken at all on Sundays and public holidays;
  - ✓ A separation distance of a minimum 500m, but preferably 1000m should be maintained between drill sites and dwellings as far as possible;
  - ✓ Noise abatement equipment, such as mufflers on diesel engines, will be maintained in good condition; and
  - ✓ If intrusive noise levels are experienced by any person at any point, the source of the noise will be moved if practical, or it will be placed in an acoustic enclosure, or an acoustic barrier will be erected between the source and the recipient.

  The above measures should reduce the significance of the potential noise impacts from ***Medium (8(M))*** to ***low (2(L))***.

- **Visual**
  - ✓ The drilling rig and other visually prominent items on the site will be located in consultation with the landowner;
  - ✓ Make use of existing vegetation as far as possible to screen the prospecting operations from view; and
  - ✓ If necessary, the operations can be screened from view by erecting a shade cloth barrier.

  The above measures should reduce the significance of the potential visual impacts from ***Significant (16(S))*** to ***Medium (12(M))***.

- **Dust fall**
  - ✓ Low vehicle speeds will be enforced on unpaved surfaces;
  - ✓ A separation distance of a minimum 500m, but preferably 1000m should be maintained between drill sites and dwellings as far as possible; and
  - ✓ Wet suppression will be applied to ensure that no visible dust is raised by any of the prospecting operations.

  The above measures should reduce the significance of the potential dust fall impacts from ***Medium (8(M))*** to ***low (2(L))***.

- **Disturbance of soil and vegetation**
  - ✓ The soil disturbance and clearance of vegetation at drill pad areas will be limited to the absolute minimum required; and
  - ✓ Disturbed areas will be re-vegetated with locally indigenous species as soon as possible.
  - ✓ No clear scraping (dozing) be carried out unless absolutely necessary to establish a level drill pad. Rather that surface vegetation be cleared to make way for the drilling rig leaving the roots intact so that vegetation can coppice and regrow.

  The above measures are expected to reduce the significance of the potential impact from ***medium (8(M))*** to ***Low (5(L))***.

- **Contamination of soil, surface water and groundwater**
  - ✓ Proper vehicle maintenance;
  - ✓ Refuelling will be done with care to minimise the chance of spillages;
  - ✓ Drilling muds will contained in lined drill sumps and this material will be removed from site and disposed in a licensed disposal facility;
  - ✓ A spill kit will be available on each site where prospecting activities are in progress; and
  - ✓ Any spillages will be cleaned up immediately.

  The above measures should reduce the significance of the potential impacts from ***medium (8(M))*** to ***low (5(L))***.

- **Friction between local residents/landowners and construction/operations personnel.**
  - ✓ All operations will be carried out under the guidance of a strong, experienced manager with proven skills in public consultation and conflict resolution;

- ✓ All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and the fact that some of the local residents may not welcome the prospecting activities in the area;

The above measures should reduce the potential for conflict between prospecting personnel and local residents from ***high (22(H))*** to ***low (8(M)***.

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

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

| **NAME OF ACTIVITY** *(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc* | **POTENTIAL IMPACT** *(Including the potential impacts for cumulative impacts)* | **ASPECTS AFFECTED** | **PHASE** **In which impact is anticipated** *(E.g. Construction, commissioning, operational Decommissioning, closure, post-closure)* | **SIGNIFICANCE if not mitigated** | **MITIGATION TYPE** *(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation.* | **SIGNIFICANCE if mitigated** |
|---|---|---|---|---|---|---|
| <u>Site establishment activities:</u> Vegetation clearance - Topsoil stripping & stockpiling - Drill pad compaction - Erection of office, toilets, fuel storage (if not by road tanker), water | Cultural and Heritage | Destruction or loss of Cultural and Heritage Resources | Construction / Set-up | 13(S) | All De Beers and contractor personnel will be made aware of the locations of all identified heritage resources, the necessity of avoiding them<br><br>Personnel will be informed about the consequences of unlawful removal of cultural and historical remains and artefacts associated with heritage sites.<br><br>A safe distance of at least 50 | *5(L)* |

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| tanker, core storage.<br>- Vehicle movements<br>- Waste management | | | | | metres will be maintained between the identified heritage resource and prospecting activities;<br><br>Where necessary, directional drilling will be practised to assess ore reserves situated below identified heritage resources.<br><br>A heritage survey by qualified archaeologist is required prior to any site activities on undisturbed land or access routes. If any heritage resources are discovered as a result of the prospecting activities, such activities will cease with immediate effect and a qualified archaeologist will be commissioned to assess their significance and determine appropriate mitigation measures. | |
| | Noise | Noise Generation | Construction / Set-up | *4(L)* | Construction/setup, operational and decommissioning activities will be limited to daylight hours on Mondays to Saturdays and no activities on Sundays and public holidays;<br><br>Separation of distance of minimum 500m, but | *4(L)* |

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| | | | | | preferably 1000m to be maintained between drill sites and dwellings;<br><br>Noise abatement equipment, such as mufflers on diesel engines, will be maintained in good condition; and<br><br>If intrusive noise levels are experienced by any person at any point, the source of the noise will be moved if practical, or it will be placed in an acoustic enclosure, or an acoustic barrier will be erected between the source and the recipient. | |
| | Visual | Visual intrusion | Construction / Set-up | 16(S) | The drilling rig and other visually prominent items on the site will be located in consultation with the landowner;<br><br>Make use of existing vegetation as far as possible to screen the prospecting operations from view; and<br><br>If necessary, the operations can be screened from view by erecting a shade cloth barrier. | 12(M) |
| | Dust fall | Dust fall & nuisance from activities | Construction / Set-up | 8(M) | Wet suppression will be applied to ensure that no visible dust is raised by any | 2(L) |

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| | | | | | of the prospecting operations;<br><br>Separation of distance of minimum 500m, but preferably 1000m to be maintained between drill sites and dwellings; and<br><br>Low vehicle speeds will be enforced on unpaved surfaces. | |
| | Soil and vegetation | Soil and vegetation disturbance from drill pad preparation | Construction / Set-up | 8(M) | The soil disturbance and clearance of vegetation at drill pad areas will be limited to the absolute minimum required;<br><br>An ecology screening survey will be required on undisturbed land and access routes in order to identify any red data / species of concern prior to any site activities being undertaken;<br><br>No clear scraping (dozing) be carried out unless absolutely necessary to establish a level drill pad. Rather that surface vegetation be cleared to make way for the drilling rig leaving the roots intact so that vegetation can coppice and regrow; and<br><br>Disturbed areas will be re- | 5(L) |

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| | | | | | vegetated with locally indigenous species as soon as possible. | |
| | Soil, surface water and groundwater | Soil, surface water and groundwater contamination from hydrocarbons | Construction / Set-up | 12(M) | Proper vehicle maintenance;<br><br>Refuelling will be done with care to minimise the chance of spillages;<br><br>A spill kit will be available on each site where prospecting activities are in progress;<br><br>Any spillages will be cleaned up immediately; and<br><br>Drilling muds will contained in lined drill sumps and this material will be removed from site and disposed in a licensed disposal facility. | 5(L) |
| | Social | Friction between local residents/land owners and construction personnel | Construction / Set-up | 22(H) | All operations will be carried out under the guidance of a strong, experienced manager with proven skills in public consultation and conflict resolution;<br><br>All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and the fact that some of the local residents may not welcome the prospecting activities in the area; | 12(M) |

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| | | | | | There will be a strict requirement to treat local residents with respect and courtesy at all times. | |
| Exploration drilling:<br>- Drilling<br>- Drill maintenance & refuelling<br>- Core sample collection & storage<br>- Vehicle movements<br>- Waste generation & management | Cultural and Heritage | Destruction or loss of Cultural and Heritage Resources | Operations | 4(L) | All De Beers and contractor personnel will be made aware of the locations of all identified heritage resources, the necessity of avoiding them<br><br>Personnel will be informed about the consequences of unlawful removal of cultural and historical remains and artefacts associated with heritage sites.<br><br>A safe distance of at least 50 metres will be maintained between the identified heritage resource and prospecting activities;<br><br>Where necessary, directional drilling will be practised to assess ore reserves situated below identified heritage resources.<br><br>A heritage survey by qualified archaeologist is required prior to any site activities on undisturbed land or access routes. If any heritage resources are discovered as | 4(L) |

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| | | | | | a result of the prospecting activities, such activities will cease with immediate effect and a qualified archaeologist will be commissioned to assess their significance and determine appropriate mitigation measures. | |
| | Noise | Noise Generation | Operations | 8(M) | Construction/setup, operational and decommissioning activities will be limited to daylight hours on Mondays to Saturdays and no activities on Sundays and public holidays;<br><br>Separation of distance of minimum 500m, but preferably 1000m to be maintained between drill sites and dwellings;<br><br>Noise abatement equipment, such as mufflers on diesel engines, will be maintained in good condition; and<br><br>If intrusive noise levels are experienced by any person at any point, the source of the noise will be moved if practical, or it will be placed in an acoustic enclosure, or an acoustic barrier will be erected between the source | 4(L) |

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| | | | | | and the recipient. | |
| | Visual | Visual intrusion | Operations | 16(S) | The drilling rig and other visually prominent items on the site will be located in consultation with the landowner;<br><br>Make use of existing vegetation as far as possible to screen the prospecting operations from view; and<br><br>If necessary, the operations can be screened from view by erecting a shade cloth barrier. | 12M |
| | Dust fall | Dust fall & nuisance from activities | Operations | 8(M) | Wet suppression will be applied to ensure that no visible dust is raised by any of the prospecting operations;<br><br>Separation of distance of minimum 500m, but preferably 1000m to be maintained between drill sites and dwellings; and<br><br>Low vehicle speeds will be enforced on unpaved surfaces. | 2(L) |
| | Soil and vegetation | Soil and vegetation disturbance from drill pad preparation | Operations | 5(L) | The soil disturbance and clearance of vegetation at drill pad areas will be limited to the absolute minimum required; | 2(L) |

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| | | | | | Conduct an ecology screening survey of sites and access for undisturbed land in order to identify any red data / species of concern, prior to site activities being undertaken;<br><br>No clear scraping (dozing) be carried out unless absolutely necessary to establish a level drill pad. Rather that surface vegetation be cleared to make way for the drilling rig leaving the roots intact so that vegetation can coppice and regrow; and<br><br>Disturbed areas will be re-vegetated with locally indigenous species as soon as possible. | |
| | Soil, surface water and groundwater | Soil, surface water and groundwater contamination from hydrocarbons | Operations | 8(M) | Proper vehicle maintenance;<br><br>Refuelling will be done with care to minimise the chance of spillages;<br><br>A spill kit will be available on each site where prospecting activities are in progress;<br><br>Any spillages will be cleaned up immediately; and<br>Drilling muds will contained in lined drill sumps and this | 5(L) |

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| | | | | | material will be removed from site and disposed in a licensed disposal facility. | |
| | Social | Friction between local residents/land owners and construction personnel | Operations | 22(H) | All operations will be carried out under the guidance of a strong, experienced manager with proven skills in public consultation and conflict resolution;<br><br>All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and the fact that some of the local residents may not welcome the prospecting activities in the area;<br><br>There will be a strict requirement to treat local residents with respect and courtesy at all times. | 18(S) |
| **Assessment of Potential Cumulative Impacts** | | | | | | |
| | Noise | Noise generation | Construction / set-up and Operation | 17(S) | As above | 8(M) |
| | Visual | Visual intrusion | Construction / set-up and Operation | 16(S) | As above | 4(L) |
| | Dust fall | Dust fall & nuisance from activities | Construction / set-up and Operation | 8(M) | As above | 2(L) |
| | Soil and vegetation | Soil and vegetation | Construction / set-up and Operation | 8(M) | As above | 5(L) |

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| | | disturbance from drill pad preparation | | | | |
| | Soil, surface water and groundwater | Soil, surface water and groundwater contamination from hydrocarbons | Construction / set-up and Operation | 8(M) | As above | 5(L) |

**k) Summary of specialist reports.**

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

| **LIST OF STUDIES UNDERTAKEN** | **RECOMMENDATIONS OF SPECIALIST REPORTS** | **SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)** | **REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED** |
|---|---|---|---|
| No specialist studies have been undertaken. A desktop analysis has been followed that informs the compilation of this assessment. | N/A | | |
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## l) Environmental impact statement

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

The majority of the prospecting activities are non-invasive and hence will have no environmental or social impact. The invasive activities that entail the drilling of approximately 8 exploration holes will have a minimal environmental and social impact as each drill site will be confined to an area of approximately 0.64 hectares. A total of two targets are anticipated and therefore the total anticipated area for disturbance is anticipated at 1.28 Ha which need to be viewed in the context of the entire prospecting license area under application which covers more than 7811.2674 hectares. However the assumption made is that approximately 25% of the targets will require testing through drilling; hence an area of 1.28 ha will be used for financial provision calculations.

The assessed impact ratings after implementation of the mitigation measures described above are as follows:

- ✓ Cultural and heritage – ***low (5(L))*** *significance*;
- ✓ Noise – ***low (2(L))*** *significance*;
- ✓ Visual impact – ***medium (12(M))*** *significance*;
- ✓ Dust fall – ***low (2(L))*** *significance*;
- ✓ Disturbance of soil and vegetation – ***medium (8(M))***, reducing to ***low (5(L))*** during the decommissioning phase;
- ✓ Contamination of soil, surface water and groundwater – ***low (5(L))***; and
- ✓ Friction between local residents and prospecting personnel – ***medium (8(M))***.

All of the identified impacts will occur for a limited and the extent of the impacts will be localised. All of the identified impacts can be suitably mitigated with the residual impact ratings being of ***low*** significance.

After drilling activities have been completed and the drill pads rehabilitated to pre-drilling status, the impacts will cease to exist.

### (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 D*

Please refer to **Appendix D** for the Environmental Sensitivities Map including the area of interest (AOI) for proposed prospecting activities.

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

- Destruction or loss of Cultural and Heritage Resources during the construction/set-up phase as well as during the operational phase as drilling commencing;
- Noise Generation from construction / set-up and operational activities of drilling;
- Visual intrusion caused by the drilling activities in the largely rural setting;
- Dust fall & nuisance from construction / set-up and drilling activities;
- Soil and vegetation disturbance from drill pad preparation during the construction / set-up and operational phase as contractors rehabilitate one site and move to the next site and prepare it;
- Soil, surface water and groundwater contamination from hydrocarbons during the construction / set-up and operational activities which include drill rig operation and use of vehicles on site; and
- Friction between local residents/landowners and construction personnel during the course of the construction / set-up and operational drilling activities.

**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 EMPr will be to:

- Provide sufficient information to strategically plan the prospecting activities as to avoid unnecessary social and environmental impacts.
- Provide sufficient information and guidance to plan prospecting activities in a manner that would reduce impacts (both social and environmental) as far as practically possible.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management plan that is effective and practical for implementation.

Through the implementation of the proposed mitigation measures it is anticipated that the identified social & environmental impact s can be managed and mitigated effectively. Through the implementation of the mitigation and management measures it is expected that:

- Heritage/cultural resources can be managed by avoidance of known resources and though consultation with landowners/stakeholders. Contractor personnel will also be briefed of these sensitivities and consequences of any damage/removal of such features;
- Noise generation can be managed through consultation and restriction of operating hours and by maintaining equipment and applying noise abatement equipment if necessary;

- Visual intrusion can be managed through consultation with landowners/stakeholders and by suitable siting of drill pads and use of screens (natural vegetation or shade cloth etc);
- Dust fall can be managed by application of wet suppression on exposed surfaces and use of water during drilling;
- Soil disturbance and clearance of vegetation at drill pad areas will be limited to the absolute minimum required and disturbed areas will be re-vegetated with locally indigenous species as soon as possible;
- Soil, surface water and groundwater contamination by hydrocarbons can be managed by conducting proper vehicle maintenance, refuelling with care to minimise the chance of spillages and by having a spill kit available on each site where prospecting activities are in progress;
- Social friction with landowners can be managed by employing strong, experienced personnel with proven skills in public consultation and conflict resolution during stakeholder consultation phases. All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and that they treat local residents with respect and courtesy at all times.

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

*Any aspects which must be made conditions of the Environmental Authorisation*

It is the opinion of the EAP that the following conditions should form part of the authorisation:

- Maintain a buffer of 100m from a water course;
- Maintain a minimum 500m (preferably 1000m) buffer from any infrastructure or dwelling;
- Conduct a heritage survey of the identified drill sites and access routes once these are known and prior to any activities being undertaken at these sites;
- Conduct an ecology survey of any identified drill sites and access routes that may fall within any critical endangered ecosystems as reflected on the map contained in **Appendix D**; and
- Landowners and land occupiers should be engaged (re-consulted) at least 1 month prior to any site activities being undertaken once drill sites are known.

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

*(Which relate to the assessment and mitigation measures proposed)*

The location of drill sites is not yet known and will be identified through the phased approach of the prospecting programme. This assessment is therefore based on a desktop approach at a broad scale and assuming that drilling could occur anywhere within the proposed prospecting license area. Once drill sites have been identified, then it is recommended that focus should be given to these sites in order to identify any cultural or heritage resources of significance, any ecologically significant areas that may occur as well as re-engaging land owners regarding the intention to access and conduct drilling activities on their property.

**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.**

It is the opinion of the EAP that the proposed prospecting activities should be authorised.

- The environmental impacts associated with the limited drilling activities are minimal provided that the proposed mitigation is implemented;
- The spatial extent of the physical impact is 0.64 hectare per drill site over a prospecting right license area of more than 7811.2674hectares; a maximum of 8 drill sites will be established in total throughout the duration of the drilling programme and therefore the maximum anticipated footprint is 1.28 ha;
- In the event that the success exceeds expectations/assumptions, the financial guarantee will be reviewed annually and variation in the planned work programme will be revised in line with Section 102 of the MPRDA.
- With appropriate care and consideration the impacts resulting from drilling can be suitably avoided, minimised or mitigated ;
- With implementing the appropriate rehabilitation activities, the impacts associated with the drilling activities can be reversed.
- Without implementation of prospecting activities the knowledge concerning the potential mineral resource within the prospecting right area will not be confirmed.

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

It is the opinion of the EAP that the following conditions should form part of the authorisation:

- Maintain a buffer of 100m from a water course;
- Maintain a 500m (preferably 1000m) buffer from any infrastructure or dwelling;
- Conduct a heritage survey of the identified drill sites and access routes across undisturbed land once these are known and prior to any activities being undertaken at these sites;
- Conduct an ecology survey of any identified drill sites and access routes across undisturbed land that may fall within any critical endangered ecosystems as reflected on the map contained in **Appendix D**; and
- Landowners and land occupiers should be engaged (re-consulted) at least 1 month prior to any site activities being undertaken once drill sites are known.

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

The authorisation is required for the duration of the prospecting right which is an initial 5 years plus a potential to extend the right by an additional 3 years. Therefore a total period of **8 years** is required.

**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.*

An undertaking is provided at the end of this report.

## s) Financial Provision

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

A financial provision of approximately **R 177,757** has been budgeted for the prospecting programme over 5 years, which includes rehabilitation activities for. A breakdown of these costs is presented in the Table below.

| No. | Description | Unit | A Quantity | B Master Rate | C Multiplication factor | D Weighting factor 1 | E=A*B*C*D Amount (Rands) |
|---|---|---|---|---|---|---|---|
| 1 | Dismantling of processing plant and related structures (including overland conveyors and powerlines) | m3 | 0 | 13 | 1 | 1 | 0 |
| 2 (A) | Demolition of steel buildings and structures | m2 | 0 | 180 | 1 | 1 | |
| 2(B) | Demolition of reinforced concrete buildings and structures | m2 | 0 | 266 | 1 | 1 | 0 |
| 3 | Rehabilitation of access roads | m2 | 0.00 | 30 | 1 | 1 | 0 |
| 4 (A) | Demolition and rehabilitation of electrified railway lines | m | 0 | 313 | 1 | 1 | 0 |
| 4 (A) | Demolition and rehabilitation of non-electrified railway lines | m | 0 | 171 | 1 | 1 | 0 |
| 5 | Demolition of housing and/or administration facilities | m2 | 0 | 361 | 1 | 1 | 0 |
| 6 | Opencast rehabilitation including final voids and ramps | ha | 0 | 189071 | 1 | 1 | 0 |
| 7 | Sealing of shafts adits and inclines | m3 | 0 | 97 | 1 | 1 | 0 |
| 8 (A) | Rehabilitation of overburden and spoils | ha | 0 | 126047 | 1 | 1 | 0 |
| 8 (B) | Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential) | ha | 0 | 156989 | 1 | 1 | 0 |
| 8 ( C ) | Rehabilitation of processing waste deposits and evaporation ponds (polluting potential) | ha | 0 | 455971 | 1 | 1 | 0 |
| 9 | Rehabilitation of subsided areas | ha | 0 | 105545 | 1 | 1 | 0 |
| 10 | General surface rehabilitation | ha | 1.28 | 99851 | 1 | 1 | 127809.28 |
| 11 | River diversions | ha | 0 | 99851 | 1 | 1 | 0.00 |
| 12 | Fencing | m | 0 | 114 | 1 | 1 | 0.00 |
| 13 | Water management | ha | 0 | 37966 | 1 | 1 | 0.00 |
| 14 | 2 to 3 years of maintenance and aftercare | ha | 0 | 13288 | 1 | 1 | 0.00 |
| 15 (A) | Specialist study | Sum | 0 | | | 1 | 0.00 |
| 15 (B) | Specialist study | Sum | | | | 1 | 0.00 |
| | | | | | Sub Total 1 | | 127809.28 |
| 1 | Preliminary and General | | 15337.1136 | | weighting factor 2: 1 | | 15337.11 |
| 2 | Contingencies | | 12780.928 | | | | 12780.93 |
| | | | | | Subtotal 2 | | 155927.32 |
| | | | | | VAT (14%) | | 21829.83 |
| | | | | | **Grand Total** | | **177757** |

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

The drilling contractor will be responsible for rehabilitating the drill pad once the drilling activities have been completed at each exploration hole. This is typically a contractual arrangement between De Beers and the drilling contractor employed to implement drilling activities which include construction / set-up of drill pad, operational drilling activities and the rehabilitation of the drill site after drilling has ceased.

The financial guarantee was calculated using the DMR official financial quantum calculator.

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

Funding for prospecting up to and including phase 5 of the work programme of approximately R 56 million is to be obtained internally and is allocated on an annual basis as part of the working cost budget of DBCM. Work is approved on a phase by phase basis, dependent on the results obtained i.e. although prospecting work may be provided for financially in the budget for a specific year, it will only take place if justified. Funding for work beyond phase 5 will be allocated on a project by project basis if investment criteria are met. The amount is also reflected in the Prospecting Work Programme submitted to the DMR.

| | YEAR 1 | YEAR 2 | YEAR 3 | YEAR 4 | YEAR 5 |
|---|---|---|---|---|---|
| **ACTIVITY** | **Expenditure (R')** | **Expenditure (R')** | **Expenditure (R')** | **Expenditure (R')** | **Expenditure (R')** |
| PHASE 1 – Desktop Study (6 months) | 21 520 | | | | |
| PHASE 1 – Desktop Study (6 months) | 567 497 | | | | |
| PHASE 2 – Target delineation (6 months) | | 4 991 971 | | | |
| PHASE 3 – Testing of Targets & micro-diamond testing (12 months) | | | 5 337 605 | | |
| PHASE 4 – Kimberlite delineation & micro-diamond testing (10 months) | | | 6 110 069 | 8 726 065 | |
| PHASE 5 – Deposit Test: First phase macro-diamond sampling (10 months) | | | | 12 963 478 | 17 870 065 |
| PHASE 6 – Deposit Assessment: Second phase macro-diamond sampling (15 months) | 7811 | 11 717 | 15 622 | 19 528 | 23 433 |
| **Annual Total** | **596 828** | **5 003 688** | **11 463 296** | **21 709 071** | **17 893 498** |
| | | | | Total Budget Years 1 to 5 | **56 666 380** |

**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*** *.*

A full consultation process is being implemented during the environmental authorisation process. The purpose of the consultation is to provide affected persons the opportunity to raise any potential concerns. As part of the consultation process the land claims commissioner will be contacted to identify if there are any claims on land covered by this application.

Concerns raised will be captured and addressed within the public participation section of this report once finalised and submitted to the authorities. As the final positioning of the drill sites cannot be confirmed without completion of phase 1 of the prospecting programme, a recommendation has been made to ensure that the directly affected landowners are re-consulted a minimum of 1 month prior to implementing invasive activities (drilling). The purpose of the re-consultation is to ensure that socio-economic impacts on directly affected persons can be raised and where possible addressed.

**(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).*

Due to the fact that the positioning of the drill sites will only be determined after phase 1 of the prospecting works programme, and in order to ensure that there is no impact on unknown heritage sites, a recommendation has been made to undertake a heritage survey of the drill sites once these are known in order to identify any cultural or heritage resources of significance. Mitigation measures proposed in this report include that no drill site will be located within 50m of any identified heritage site (which may occur during the prospecting programme). Furthermore, from desktop studies undertaken, no heritage states have been identified to occur in the area; however these need to be confirmed by site surveys.

**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*** *4).*

The proposed prospecting activities (including the drilling) requested as part of this authorisation is the only current viable manner in which a mineral resource can be

identified and used to generate a SAMREC compliant resource which is a minimum requirement to determine whether it is viable to invest in a future mine.

## PART B
## ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

**1) Draft environmental management programme.**

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

This has already been covered. Refer to Part A, Section 1(a) of this document.

**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).*

This has already been covered. Refer to Part A, Section 1(h) of this document.

**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)*

This has already been covered. Refer to Part A as well as **Appendix D** of this document.

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

The main management objectives for the invasive drilling activities are:

- Avoid potential impacts by positioning the drill sites in a manner which avoids / minimise potential impacts. This can be achieved by implementing appropriate buffer zones;
- Reduce impacts through implementing realistic operational management measures such as imposing restrictions on the time of day when drilling can take place and adherence to the site EMP; and
- Ensure that chemical and hydrocarbon spillages are avoided, where they cannot all together avoided minimised and mitigated.
- Establisgh approriate waste management system
- Restore the physical impact of drilling through implementation of concurrent rehabilitation as and when drilling at one site is completed.

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

After prospecting is complete at each drill site, will be rehabilitated to be safe, stable, re-vegetated, non-polluting, non-eroded and in a state that is suitable for agreed post-closure land use.

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

The drilling activities will use between 5 000L to 10 000L per day which falls withing “small industrial user” where the use is less than twenty cubic metres per day for prospecting. Therefore the water that will be used for the prospecting activities will be sourced on agreement from an existing authorized water user which could be either the land owner or local municipality. No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act no. 36 of 1998).

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

No – Based on the limited water needs of the proposed prospecting activities, water from a legal source will be brought to the drill sites by mobile water tanker as and when required.

**iv) Impacts to be mitigated in their respective phases**

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

| **ACTIVITIES** *(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)* | **PHASE** *(of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).* | **SIZE AND SCALE of disturbance** *(volumes, tonnages and hectares or m²)* | **MITIGATION MEASURES** *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)* | **COMPLIANCE WITH STANDARDS** *(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)* | **TIME PERIOD FOR IMPLEMENTATION** *Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.* |
|---|---|---|---|---|---|
| Site establishment activities:<br>- Vegetation clearance<br>- Topsoil stripping & stockpiling<br>- Drill pad compaction<br>- Placement of temporary | Construction / set-up phase & Operational phase | Max. 0.64 Ha per drill site | • Undertake heritage survey prior to site activities in order to identify cultural/heritage features.<br>• Avoid cultural/heritage | Heritage Act | Before and during drilling activities |

| | | | | | |
|---|---|---|---|---|---|
| portable toilets and resting place.<br>- Vehicle movements<br>- Waste management<br><br><u>Exploration drilling:</u><br>- Drilling<br>- Drill maintenance & refuelling<br>- Core sample collection & storage<br>- Vehicle movements<br>- Waste generation & management | | | impacts by maintaining 50m buffer from any identified heritage feature and marking these off.<br>• Any buried artefacts that may be uncovered during site activities will require such activities to stop and a qualified archaeologist will be commissioned to assess their significance and determine appropriate mitigation measures. | | |
| | Construction / set-up phase & Operational phase | 0.64 Ha per drill site | • Control noise generation by maintaining equipment.<br>• Limited to daylight hours on Mondays to Saturdays and no activities on Sundays and public holidays.<br>• Maintain a buffer of 500m between drill sites and dwellings.<br>• The resting place shall be located outside of the 82dB Zone of the drill site. | SANS 10103 guideline | Before and during drilling activities |
| | Construction / set-up phase & | 0.64 Ha per drill site | • The drilling rig and other visually prominent items on the site will be located | n/a | Before and during drilling activities |

| | | | | | |
|---|---|---|---|---|---|
| | Operational phase | | in consultation with the landowner;<br>• Make use of existing vegetation as far as possible to screen the prospecting operations from view; and<br>• If necessary, the operations can be screened from view by erecting a shade cloth barrier. | | |
| | Construction / set-up phase & Operational phase | 0.64 Ha per drill site | • Control dust emission by ensuring drill rig employs dust suppression system.<br>• Low vehicle speeds will be enforced on unpaved surfaces.<br>• Maintain a buffer of 500mbetween drill sites and dwellings. | GN R. 827 (NEM:AQA) | Before and during drilling activities |
| | Construction / set-up phase & Operational phase | 0.64 Ha per drill site | • The soil disturbance and clearance of vegetation at drill pad areas will be limited to the absolute minimum required and will not be dozed or scraped with vegetation roots left intact for later re-growth ; and<br>• Disturbed areas will be re-vegetated with locally | n/a | Before and during drilling activities |

| | | | | | |
|---|---|---|---|---|---|
| | | | indigenous species as soon as possible. | | |
| | Construction / set-up phase & Operational phase | 0.64 Ha per drill site | • All chemicals and hydrocarbons shall be stored within 110% bund wall capacity<br>• Underneath the drill rig or any equipment with potential oil spillages shall be lined with plastic liner to prevent soil and water contamination.<br>• Avoid hydrocarbon spills by employing proper vehicle maintenance;<br>• Refuelling will be done with care to minimise the chance of spillages;<br>• A spill kit will be available on each site where prospecting activities are in progress; and<br>• Any spillages will be cleaned up immediately.<br>• Drill muds to be contained in lined sump and disposed of off-site at licensed facility. | GN R. 704 (NWA) | Before and during drilling activities |
| | Construction / set-up phase & Operational phase | 0.64 Ha per drill site | • All operations will be carried out under the guidance of a strong, | NEMA | Before and during drilling activities |

| | | | | | |
|---|---|---|---|---|---|
| | | | experienced manager with proven skills in public consultation and conflict resolution, including environmental coordinator where applicable;<br>• All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and the fact that some of the local residents may not welcome the prospecting activities in the area;<br>• There will be a strict requirement to treat local residents with respect and courtesy at all times. | | |

**e) Impact Management Outcomes**

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

| **ACTIVITY** *(whether listed or not listed).* *(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).* | **POTENTIAL IMPACT** *(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)* | **ASPECTS AFFECTED** | **PHASE** **In which impact is anticipated** *(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)* | **MITIGATION TYPE** *(modify, remedy, control, or stop) through* *(e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)* *E.g.* *- Modify through alternative method.* *- Control through noise control* *- Control through management and monitoring* *- Remedy through rehabilitation.* | **STANDARD TO BE ACHIEVED** *(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.* |
|---|---|---|---|---|---|
| Site establishment activities:<br>- Vegetation clearance<br>- Topsoil stripping & stockpiling | Cultural and Heritage | Destruction or loss of Cultural and Heritage Resources | Construction / set-up phase &<br>Operational phase | • Undertake heritage survey prior to site activities in order to identify cultural/heritage features and cordon | Heritage Act |

| | | | | | |
|---|---|---|---|---|---|
| - Drill pad compaction<br>- Erection of office, toilets, fuel storage (if not by road tanker), water tanker, core storage.<br>- Vehicle movements<br>- Waste management<br><br>Exploration drilling:<br>- Drilling<br>- Drill maintenance & refuelling<br>- Core sample collection & storage<br>- Vehicle movements<br>- Waste generation & management | | | | these off with Chevron tape.<br>• Avoid cultural/heritage impacts by maintaining 50m buffer from any identified heritage feature.<br>• Any buried artefacts that may be uncovered during site activities will require such activities to stop and a qualified archaeologist will be commissioned to assess their significance and determine appropriate mitigation measures. | |
| | Noise | Noise Generation | Construction / set-up phase & Operational phase | • Control noise generation by maintaining equipment.<br>• Limited to daylight hours on Mondays to Saturdays and no activities on Sundays and public holidays.<br>• Maintain a buffer of 500m-1000m between drill sites and dwellings.<br>• If intrusive noise levels are experienced by any person at any point, the | SANS 10103 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | source of the noise will be moved if practical, or it will be placed in an acoustic enclosure, or an acoustic barrier will be erected between the source and the recipient. | |
| | Visual | Visual intrusion | Construction / set-up phase & Operational phase | • The drilling rig and other visually prominent items on the site will be located in consultation with the landowner;<br>• Make use of existing vegetation as far as possible to screen the prospecting operations from view; and<br>• If necessary, the operations can be screened from view by erecting a shade cloth barrier. | n/a |
| | Dust fall | Dust fall & nuisance from activities | Construction / set-up phase & Operational phase | • Control dust emission by ensuring drill rig employs dust suppression system.<br>• Low vehicle speeds will be enforced on unpaved surfaces.<br>• Maintain a buffer of 500m-1000m between drill sites and dwellings. | GN R. 827 (NEM:AQA) |
| | Soil and vegetation | Soil and | Construction / set-up phase & | • The soil disturbance and | n/a |

| | | | | | |
|---|---|---|---|---|---|
| | | vegetation disturbance from drill pad preparation | Operational phase | clearance of vegetation at drill pad areas will be limited to the absolute minimum required and will not be dozed or scraped with vegetation roots left intact for later re-growth; and<br>• Disturbed areas will be re-vegetated with locally indigenous species as soon as possible. | |
| | Soil, surface water and groundwater | Soil, surface water and groundwater contamination from hydrocarbons | Construction / set-up phase &<br>Operational phase | • Avoid hydrocarbon spills by employing proper vehicle maintenance;<br>• Refuelling will be done with care to minimise the chance of spillages;<br>• A spill kit will be available on each site where prospecting activities are in progress;<br>• Any spillages will be cleaned up immediately and contaminated material will be dis[posed as licenced hazardous waste site;<br>• Drill muds to be contained in lined sump and disposed of off-site | GN R. 704 (NWA) |

| | | | | | |
|---|---|---|---|---|---|
| | | | | at licensed facility. | |
| | Social | Friction between local residents/land owners and construction personnel | Construction / set-up phase & Operational phase | • All operations will be carried out under the guidance of a strong, experienced manager with proven skills in public consultation and conflict resolution;<br>• All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and the fact that some of the local residents may not welcome the prospecting activities in the area;<br>• There will be a strict requirement to treat local residents with respect and courtesy at all times. | NEMA |

**f) Impact Management Actions**

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

| **ACTIVITY** *(whether listed or not listed).* *(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).* | **POTENTIAL IMPACT** *(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)* | **MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. □ Modify through alternative method. □ Control through noise control □ Control through management and monitoring Remedy through rehabilitation. | **TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case | **COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| | | | may be. | |
| Site establishment activities:<br>- Vegetation clearance<br>- Topsoil stripping & stockpiling<br>- Drill pad compaction<br>- Erection of office, toilets, fuel storage (if not by road tanker), water tanker, core storage.<br>- Vehicle movements<br>- Waste management<br><br>Exploration drilling:<br>- Drilling<br>- Drill maintenance & refuelling<br>- Core sample collection & storage<br>- Vehicle movements<br>- Waste generation & management | Cultural and Heritage | • Undertake heritage survey prior to site activities in order to identify cultural/heritage features and cordon these off with Chevron tape.<br>• Avoid cultural/heritage impacts by maintaining 50m buffer from any identified heritage feature.<br>• Any buried artefacts that may be uncovered during site activities will require such activities to stop and a qualified archaeologist will be commissioned to assess their significance and determine appropriate mitigation measures. | Before and during drilling activities | Heritage Act |
| | Noise | • Control noise generation by maintaining equipment.<br>• Limited to daylight hours on Mondays to Saturdays and no activities on Sundays and public holidays.<br>• Maintain a buffer of 500m-1000m between drill sites and dwellings.<br>• If intrusive noise levels are experienced by any person at any point, the source of the noise will be moved if practical, or it will be placed in an acoustic enclosure, or an acoustic barrier will be erected between the source and the recipient. | Before and during drilling activities | SANS 10103 |

| | | | | |
|---|---|---|---|---|
| | Visual | • The drilling rig and other visually prominent items on the site will be located in consultation with the landowner;<br>• Make use of existing vegetation as far as possible to screen the prospecting operations from view; and<br>• If necessary, the operations can be screened from view by erecting a shade cloth barrier. | Before and during drilling activities | n/a |
| | Dust fall | • Control dust emission by ensuring drill rig employs dust suppression system.<br>• Low vehicle speeds will be enforced on unpaved surfaces. | Before and during drilling activities | GN R. 827 (NEM:AQA) |
| | Soil and vegetation | • The soil disturbance and clearance of vegetation at drill pad areas will be limited to the absolute minimum required and will not be dozed or scraped with vegetation roots left intact for later re-growth; and<br>• Disturbed areas will be re-vegetated with locally indigenous species as soon as possible. | Before and during drilling activities<br>Disturbed areas to be re-vegetated as soon as possible | n/a |
| | Soil, surface water and groundwater | • Avoid hydrocarbon spills by employing proper vehicle maintenance;<br>• Refuelling will be done with care to minimise the chance of spillages;<br>• A spill kit will be available on each site where prospecting activities are | Before and during drilling activities | GN R. 704 (NWA) |

| | | | | |
|---|---|---|---|---|
| | | in progress;<br>• Any spillages will be cleaned up immediately; and<br>• Drill muds to be contained in lined sump and disposed of off-site at licensed facility. | | |
| | Social | • All operations will be carried out under the guidance of a strong, experienced manager with proven skills in public consultation and conflict resolution;<br>• All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and the fact that some of the local residents may not welcome the prospecting activities in the area;<br>• There will be a strict requirement to treat local residents with respect and courtesy at all times. | Before and during drilling activities | NEMA |

**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.**

After prospecting is complete at each drill site, the land will be rehabilitated to be safe, stable, non –eroded, non-polluting and suitable for agreed post closure land use

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

The closure objectives have been captured within the draft BAR which has been made available to all registered interested and affected parties.

**(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.**

After drilling has been completed in one area, the drilling team will ensure the site is reverted back to its original state by carrying out the following:

- Removing all infrastructures, including the drill rig, the temporary office, the mobile diesel tank, the mobile water tank and the chemical toilet.
- Capping the boreholes as per legal requirements.
- Ensure that no foreign matter is left behind on the drill site.
- Refilling the sump required for the drilling activities. Initially the plastic lining will be removed and disposed of in a registered landfill site and the soil returned to in order to rehabilitate the area.
- The whole drill site will be inspected for any signs of hydrocarbon pollution. Any identified soil which has been polluted as a result of the drilling activities will be removed and disposed of in a registered landfill site.
- Any area compacted as a result of the drill rig will be ripped and any ruts created by accessing or leaving the site for the drilling activity will be filled in to ensure that no future erosion shall occur on site.
- Applicable landowner will be requested to inspect the rehabilitated area.

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

The closure objectives are to return the land disturbed by drilling activities back to its original condition. The rehabilitation plan above provides the detail on how this will be achieved. Through experience, we can confirm that effective rehabilitation of drill sites is possible and achievable with the rehabilitation plan set out above.

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

As per Part A, Section (s) (i) of this report.

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

As per Part A, Section (s) (ii) of this report.

**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

| 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 |
|---|---|---|---|---|
| All Prospecting Activities | N/A | Ensure that the prospecting programme is being implemented in line with the approved prospecting works programme | De Beers Geologist | Submit an annual prospecting progress report to DMR |
| | All commitments contained in the BA Report and accompanying EMPr | Ensure commitments made within the approved BAR and EMPr are being adhered to. | Internal environmental control officer and independent EAP | Undertake and submit an environmental performance audit every two years to DMR |
| Drilling Activities | Cultural Heritage Resources | Monitor groundwater quality and level within 500m from a drill site (If any).<br>Weekly inspections will cover the following:<br>- Implementation of effective waste management<br>- Establish and implement a stakeholder compliant register on site and ensure that all complaints are responded to | Appointed drilling contractor | Weekly inspection and reporting |
| | Noise | | | |
| | Dust fall | | | |
| | Visual | | | |
| | Soil & Vegetation | | | |
| | Soil, Surface Water & Groundwater | | | |
| | Social | | | |
| | Housekeeping & maintenance | | | |

| | | | | |
|---|---|---|---|---|
| | Waste management<br>Rehabilitation | promptly.<br>- Ensure that an oil spill kit is readily available.<br>- Ensure that all chemicals and hydrocarbons are stored within bundwalls<br>- Ensure that the fire brake is maintained.<br>- Rehabilitation of drill pads<br>- Records of water intersections on borehole logs<br>- Control and minimise the development of new access tracks<br>- Appropriate storage and handling of topsoil | | |
| Post Drilling | Groundwater<br>Revegetation<br>Stability<br>Soil erosion<br>Alien invasive species | Monitor the external boreholes within 500m from drill post drilling (if any).<br>The Drill site shall be monitored six monthly until closure certificate is obtained. | Environmental Coordinator | Monitoring report |

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

Annual environmental performance audit report will be undertaken alternating between internal and independent environmental assessment practitioner (EAP) after the granting of the prospecting right and authorisation.

**m) Environmental Awareness Plan**

De Beers Environmental Awareness Training is part of its Induction process and environmental Management System (EMS). The induction includes:

- Awareness training for contractors and employees;
- Job specific training – training for personnel performing tasks which could cause potentially significant environmental impacts;
- EMS training;
- Comprehensive training – on emergency response, spill management, etc;
- Specialised skills; and
- Training verification and record keeping.

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

Before commencement of the prospecting activities all employees and contractors who are involved with such activities should attend relevant induction and training. It is standard practice for employees and the employees of contractors that will be working on a new project or at a new site to attend an induction course where the nature and characteristics of the project and the site are explained.

The training course should include key information abstracted from the EMP pertaining to the potential environmental impacts, the mitigation measures that will be applied, the monitoring activities that will be undertaken and the roles and responsibilities of contractors' and De Beers personnel.

The full EMP document is also made available to attendees.

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

Environmental risks and how to manage them are dealt with in the induction course referred to in section (m) (i) above. If an incident of environmental pollution or damage does occur it is analysed and appropriate prevention and/or mitigation measures are developed. These measures are added to the EMP and conveyed to the relevant personnel.

All unplanned incidents with the potential to cause pollution or environmental degradation or conflict with local residents will be reported to The Mineral Resources Manager within 24 hours.

**Hydrocarbon Spills**

Hydrocarbon spills that are considered to be emergency incidents are large-scale spills (cover a surface area >1m2), resulting from situations such as; a leaking diesel bowser, an oil drum that is knocked over, large spillages from equipment, etc. Activities that are involved in the clean-up of such instances include:

- The containment of the spill,
- The removal of all contaminated material, and
- The disposal (at a licenced hazardous disposal facility) or bioremediation (at a licenced facility) of this material.

**Fire**

There is the potential for fire to occur in the following locations of the drill site:

- Veld fires across vegetated areas; and
- Vehicles and equipment.

***Veld fires***: Any person who observes the fire must report it to the fire brigade immediately and then to their supervisor. If possible, additional personnel may be sent to contain the fire, but only if the lives of the personnel will not be endangered.

***Vehicles and Equipment***: Fire extinguishers will be available at the site where drilling activities will take place and in the vehicles. All staff members will be trained in the use of fire-fighting equipment.

**n) Specific information required by the Competent Authority**

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

Not applicable at this stage.

**2) UNDERTAKING**

The EAP herewith confirms

**a)** the correctness of the information provided in the reports [X]

**b)** the inclusion of comments and inputs from stakeholders and I&APs; [X]

**c)** the inclusion of inputs and recommendations from the specialist reports where relevant; and [X]

**d)** that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein. [X]

_____

Signature of the environmental assessment practitioner:

_____

Name of company:

_____

Date

**-END-**