



**mineral resources**

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

**NAME OF APPLICANT:** De Beers Consolidated Mines Proprietary Limited

**REFERENCE NUMBER:** NC 30/5/1/1/2/11445 PR

**ENVIRONMENTAL MANAGEMENT PLAN**

**SUBMITTED**

**IN TERMS OF SECTION 39 AND OF REGULATION 52 OF THE MINERAL  
AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002,  
(ACT NO. 28 OF 2002) (The Act)**

## **STANDARD DIRECTIVE**

Applicants for prospecting rights or mining permits, are herewith, in terms of the provisions of Section 29 (a) and in terms of section 39 (5) of the Mineral and Petroleum Resources Development Act, directed to submit an Environmental Management Plan strictly in accordance with the subject headings herein, and to compile the content according to all the sub items to the said subject headings referred to in the guideline published on the Departments website, within 60 days of notification by the Regional Manager of the acceptance of such application. This document comprises the standard format provided by the Department in terms of Regulation 52 (2), and the standard environmental management plan which was in use prior to the year 2011, will no longer be accepted.

**IDENTIFICATION OF THE APPLICATION IN RESPECT OF WHICH THE ENVIRONMENTAL MANAGEMENT PLAN IS SUBMITTED.**

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## **1 REGULATION 52 (2): Description of the environment likely to be affected by the proposed prospecting or mining operation**

### **1.1 The environment on site relative to the environment in the surrounding area.**

#### **1.1.1 Land Use**

The land in the property is being used for commercial farming (grazing of livestock), game farming and hunting. The area is also used as residence for surface owners and farm workers as well as their respective families, with supporting infrastructure such as water points supplied by wind pumps, shed, farmhouse and enclosures (kraals). The closure objective will be to return the land to its current state of land use.

#### **1.1.2 Topography and drainage**

The general area is relatively flat, at an average elevation of between 1224m and 1282m above sea level (Refer to 1:50,000 topographic map sheets 2924AC and 2924AD). The area applied for is approximately 32.5km east of the Orange River.

#### **1.1.3 Soils**

The soil for the area which is applied for are two types of red yellow Apedal freely drained soil of approximately 300mm deep. The first type (code Ag146) is contributed by shales and/or mudstones of the Ecca Group along with dolerite, the second type (code Ag135) is contributed by alluvium and aeolian sand on calcrete, shale of the Ecca Group and dolerite.

### SOIL TYPE OF THE LAND UNDER APPLICATION

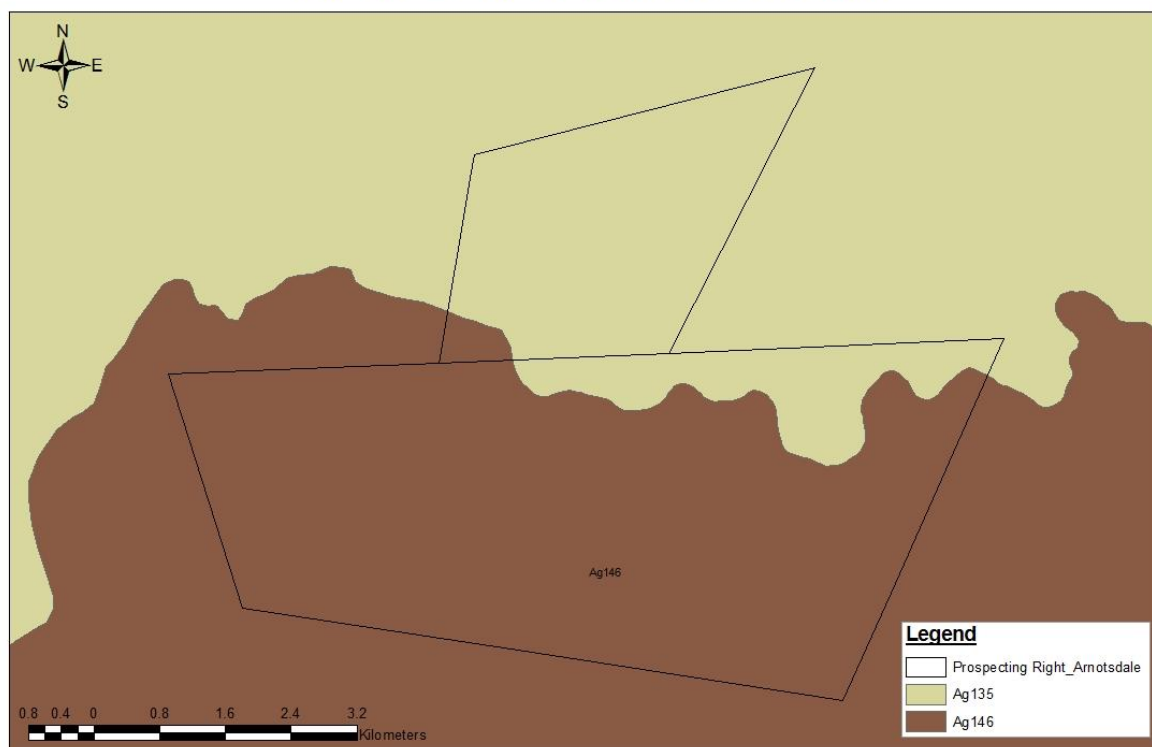


Figure 1: Soil types of the area under application.

#### 1.1.4 Groundwater levels

The depth of the water table has been reported by the surface owner to be at a depth of between 30m and 50m. The actual depth of water table will be recorded during drilling and included in the progress report if water is intersected during drilling.

#### 1.1.5 Vegetation

The Northern Cape consists mainly of grasslands, shrubs, a minor amount of acacia thorn trees, as well as some Karoo vegetation. The vegetation of the area applied for belongs to the Nama-Karoo Biome; Northern Upper Karoo (Figure 2). The following sections describe each of the vegetation types mentioned above.

#### **NORTHERN UPPER KAROO (CODE NKu3)**

This vegetation is classed as least threatened with conservation target of 21%. Erosion is moderate (46.2%), very low (32%) and low (20%). *Prosopis glandulosa* regarded as one of the 12 agricultural most important invasive alien plants in South Africa is widely distributed in this vegetation type. The important taxa of this vegetation type are described below:

## Important Taxa

Small Trees: *Acacia mellifera* subsp *detinens*, *Boscia albitrunca*.

Tall shrubs: *Lycium cinereum* (d), *L. horridum*, *L. oxycarpum*, *L. schizocalyx*, *Rhigozum trichotomum*.

Low Shrubs: *Chrysocoma ciliate* (d), *Pentzia calcarea* (d), *P. globosa* (d), *P. incana* (d), *Amphiglossa triflora*, *Aptosimum marlothii*, *A. spinescens*, *Asparagus glaucus*, *Barleria rigida*, *Berkheya annectens*, *Eriocephalus ericoides subspericoides*, *Eglandulosus*, *Espinescens*, *Europs asparagoides*. *Felecia muricata*, *Helichrysum lucilioides*, *Hermannia spinosa*, *Leucas capensis*, *Limeum aethiopicum*, *Microloma armatum*, *Osteospermum leptolobum*, *O. spinescens*, *Pegolettia retrofracta*, *Pentzia lanata*, *Phyllanthus maderaspatensis*, *Plinthus karoicus*, *Pteronia glauca*, *P. sordida*, *Selago geniculate*, *S. saxatilis*, *Tetragonia arbuscula*, *Zygophyllum lichtensteinianum*.

Succulent Shrubs: *Hertia pallens*, *Salsola calluna*, *S. glabrescens*, *S. rabieana*, *S. tuberculata*, *Zygophyllum flexuosum*.

Semiparaitic Shrub: *Thesium hystrix* (d).

Herbs: *Chamaesyce inaequilatera*, *Convolvulus sagittatua*, *Dicoma capensis*, *Gazania Krebsiana*, *Hermannia comosa*, *Indigofera alternans*, *Lessertia pauciflora*, *Radyera urens*, *Sesamum capense*, *Sutera pinnatifida*, *Tribulus terrestris*, *Vahlia capensis*

Succulent Herbs: *Psilocaulon coriarium*.

Geophytic Herbs: *Moraea pallida*.

Graminoids: *Aristida adscensions* (d), *A. congesta*, *A. diffusa* (d), *Enneapogon desvauxii* (d), *Eragrostis lehmanniana* (d), *E. obtuse* (d), *E. truncate* (d), *Sporobolus fimbriatus* (d), *Stipagrostis obtuse* (d), *Eragrostis bicolor*, *E. porosa*, *Fingerhuthia africana*, *Heteropogon contortus*, *Stipagrostis ciliate*, *Themeda triandra*, *Tragus berteonianus*, *T. koelerioides*, *T racemosus*.

## Biographically Important Taxa

Herb (western distribution limit): *Convolvulus boedeckerianus*.

Tall Shrubs: (southern distribution limit): *Gymnosaporina szyszyłowiczii* subsp. *namibiensis*

## Endemic Taxa

Succulent Herbs: *Lithops hokeri*, *Stomatium pluidens*  
 Low Shrubs: *Atriplex spongiosa*, *Galena exigua*  
 Herb: *Manulea deserticola*

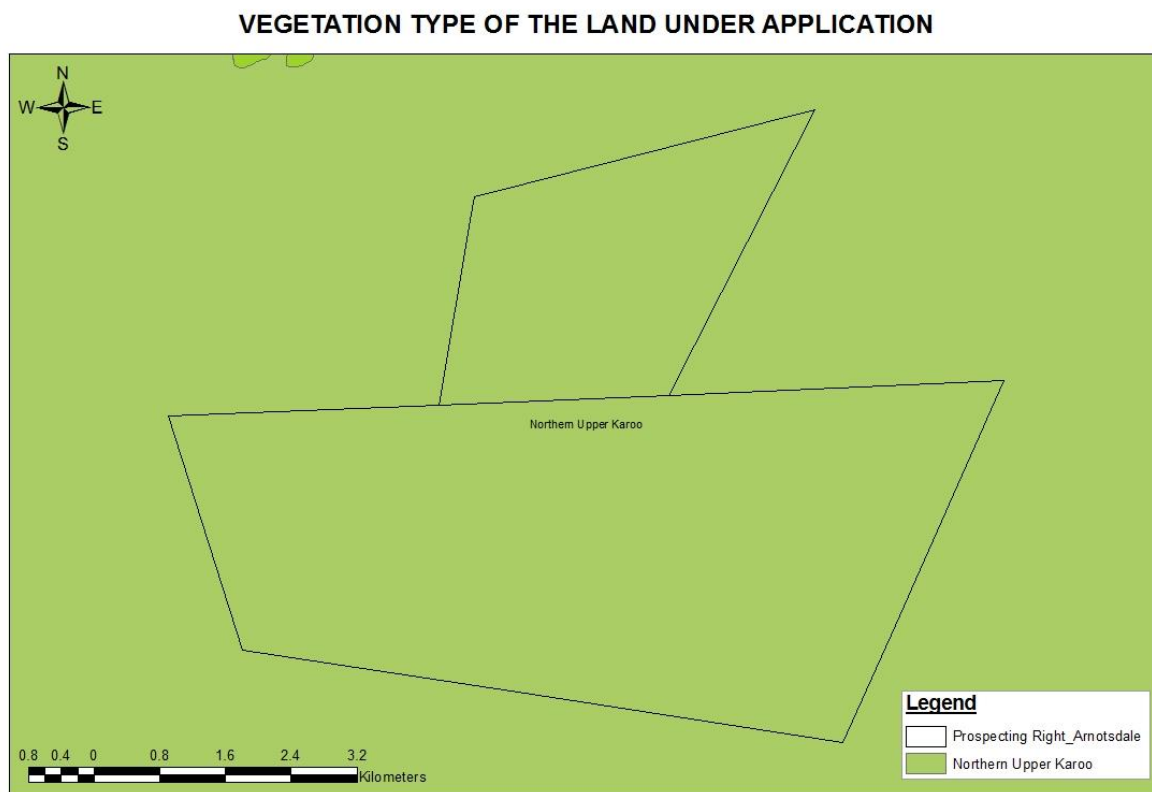


Figure 2: Vegetation type of the area under application.

Source: Mucina, L. and Rutherford, M.C. (editors), 2006. *The Vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

No specific protected trees have been reported. The above list is applicable to vegetation types as a whole, thus it is not known whether the particular species are found in the area applied for.

### 1.1.6 Fauna

Naturally, the area would support a large variety of grazers found in the region, but due to the farming activities, the area now supports a lesser variety of reptiles (snakes & lizards), birds and mammals. Mammal species that are known to naturally occur in the region as a whole are summarized in Table 1 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). No specific protected animal species were reported.

Table 1: Mammal species that occur in the area

<b>Common name</b>	<b>Scientific name</b>
<u>Carnivores</u>	
African Wild Dog	<i>Lycaon pictus</i>
African Wild Cat	<i>Felis lybica</i>
<u>Herbivores</u>	
African Elephant	<i>Loxodonta Africana</i>
<u>Ungulates</u>	
Kudu	<i>Tragelaphus stesiceros</i>
Springbok	<i>Atidorcas marsupialis</i>
Mountain Reedbuck	<i>Redunca fulvorufula</i>
Black Wildebeest	<i>Connochaetes gnou</i>
Red Hartebeest	<i>Alcelaphus caama</i>
White Rhinoceros	<i>Ceratotherium simum</i>
Buffalo	<i>Syncerus caffer</i>
Zebra	<i>Equus quagga</i>
Eland	<i>Taurotragus oryx</i>
Giraffe	<i>Giraffa camelopardalis</i>

Based on the distribution of Red Data Bird species, the following list of birds may be present (Table 2), (Source: The Eskom red data book of birds of South Africa, Lesotho and Swaziland, Barnes K.N, 2000).

Table 2: List of birds known to occur in the area

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

The planned prospecting is unlikely to have a significant impact on these animals, due to its limited footprint and the fact that much of the area is used for farming purposes.

### 1.1.7 Protected Areas

There are farm houses present, although their ages are unknown, and graves may be present near these. No graves were however reported by the surface owners.

However, the greatest extent of the area is used for farming. Initial geophysical surveying may be within 50m of a farmhouse and/or grave but these activities have no impact; however heritage and archaeological impact assessment will be done if the prospecting project proceeds to advanced phases and if graves are found to be present will be reported in the progress report.

## **1.2 The specific environmental features on the site applied for which may require protection, remediation, management or avoidance.**

Due to the fairly dry nature of the area and the existing land use, the vegetation, soil and groundwater are the main elements that need protection in general. In particular, damage to small farm dams and water boreholes (wind pumps) must be avoided. Prospecting activities will be well away (at least 50 metres) from afore mentioned sites. Damage to farmhouses (with existing/associated graves) and other structures such as fences, gates, farm roads or tracks should be avoided.

During drilling activities water strike depth is noted and any significant changes in water volumes are recorded. Plugging of the hole will be investigated as an option in the case where drilling goes through an aquifer. Moreover, during extensive drilling water quality can be monitored to mitigate contamination of water. Ground water pollution must be avoided through the use of only environmentally friendly drilling additives and the proper closing of boreholes on completion.

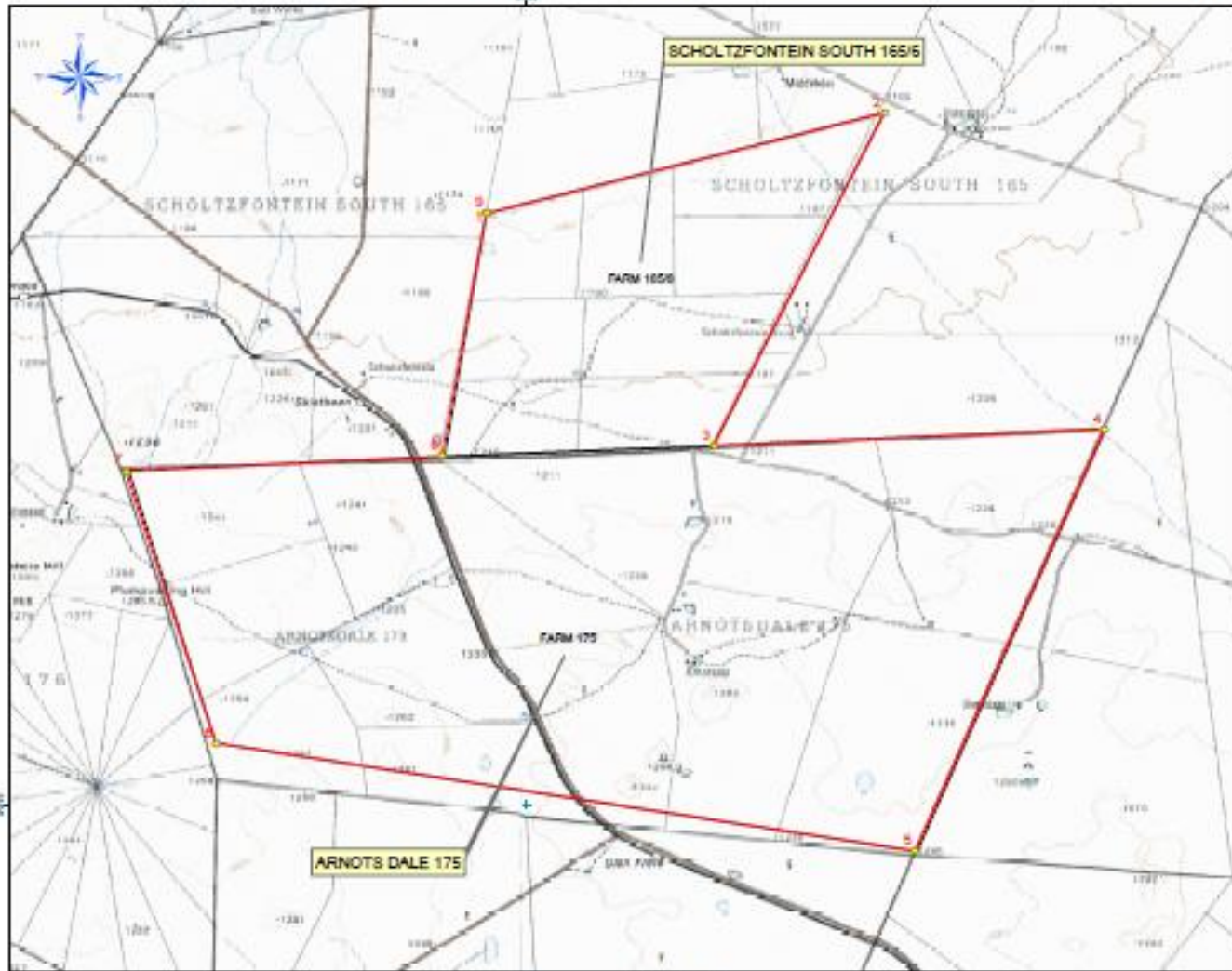
Other aspects to be addressed in all our prospecting work (although not raised directly) through the Environmental Management Plan include:

- Avoiding soil pollution - preventing and controlling oil or hydraulic fluid spills.
- Avoiding grass fires - no fires to be used when prospecting, precautions and controls in place for machinery.
- Avoiding littering - proper waste removal and disposal to be practiced.
- Minimising vegetation destruction - by limiting the creation of new tracks, clearing minimal areas for drilling and rehabilitating effectively. Disturbed areas may need to be fenced off to allow vegetation recovery.
- Avoiding excessive noise & dust - this will require specific measures depending on the nature of work. Prospecting is mostly restricted to daylight hours so noise will be limited to these periods. Dust suppression measures can be taken where this is a problem.
- Impact on fauna - as prospecting takes place in a limited area for a relatively short duration, impacts on fauna will be minimal.

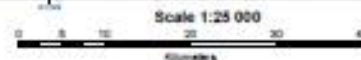
## **1.3 Map showing the spatial locality of all environmental, cultural/heritage and current land use features identified on site.**

The Regulation 2.2 plan attached shows the general features of the area, such as farm dams, wind pumps, buildings, ruins and roads/tracks; no other specific features have been identified.

**PLAN AS REFERRED TO IN REGULATION 2.2 IN FORCE IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (28 OF 2002).  
IN SUPPORT OF AN APPLICATION FOR A PROSPECTING RIGHT IN TERMS OF SECTION 16 OF THE AFORESAID ACT.**



GOV MAP SHEET : 2924AC AND 2924AD



**ARNOTS DALE 175 & OTHERS**



**DESCRIPTION OF LAND UNDER APPLICATION FOR A PROSPECTING RIGHT**

The farm Arnots Dale 175,  
A Portion B (Vasthoeweg) (a Portion of Portion 2) of the farm Scholtzfontein South 165

The figure numbered :  
1, 2, .. 9, 1

Represents an area of land  
in extent

**3788.8338 Hectares**

Magisterial District of  
HERBERT

**NORTHERN CAPE PROVINCE**

**LEGEND**

- City / town / villages
- Roads
- Land Under Application
- Farms
- Magisterial Districts
- Province border

**NOTES**

- 1) Please see Table 2 for any specific servitudes registered against the title deeds.
- 2) Coordinates for polygon of land under application: refer to accompanying listing file for details.

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

**SIGNATURE OF APPLICANT:**

**NAME :** \_\_\_\_\_ (Print)

**DATE :** \_\_\_\_\_

Plan Approved:

\_\_\_\_\_  
Regional Manager  
NORTHERN CAPE PROVINCE

Department Mineral Resources

**DATE :** \_\_\_\_\_

## Part D of Form B Annexure 1, Application for Prospecting Right

Coordinates referred to in plan. Coordinates based on Geographic, WGS84 (Datum)

<b>NODE ID</b>	<b>X</b>	<b>Y</b>
1	24.246271	-29.277846
2	24.283606	-29.26838
3	24.267583	-29.299623
4	24.304267	-29.298085
5	24.286474	-29.337625
6	24.220904	-29.32752
7	24.212446	-29.302039
8	24.242101	-29.300611
9	24.246271	-29.277846

**1.4 Confirmation that the description of the environment has been compiled with the participation of the community, the landowner and interested and affected parties.**

During the consultation process, the parties were asked about the land use and the environment, both verbally and in the form of a short questionnaire. Please refer to the report on consultation.

**2 REGULATION 52 (2) (b): Assessment of the potential impacts of the proposed prospecting or mining operation on the environment, socio-economic conditions and cultural heritage.**

**2.1 Description of the proposed prospecting or mining operation**

Prospecting for kimberlite is a dynamic, result driven operation which proceeds in phases, the outcome of which cannot be predicted or predetermined. Excepting the first phase, the scope of each subsequent phase is dependent on the results of earlier phases. The results of the reconnaissance sampling and geophysics will indicate the areas over which the subsequent phases of work are required. These subsequent phases can include drilling and first stage bulk sampling as well as activities such as detailed drilling, geophysical surveys and further bulk sampling to gather the additional information required in support of feasibility studies. The sites for the follow-up phases of work cannot be identified in advance nor can the phases be quantified in advance although some estimates are presented in this work programme, as presented below. Note that these estimates can be considered as being reasonably accurate for the first year of work only. The prospecting will take place in phases as described in the prospecting work plan (PWP) summary in Table 3 below.

Table 3: Summary of the prospecting activities.

Phase	Activity (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required (refers to the competent personnel that will be employed to achieve the required results)	Timeframe (in months for the activity)	Outcome (What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome (deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g. geologist, mining engineer, surveyor, economist, etc)
1	<b>Desktop Study</b> a) Review of available information b) Gap analysis c) Identify potential target areas d) Identify appropriate prospecting techniques	Geologist & geophysicist	1 month  1 month  3 months  1 month	Report on specific targets with sampling and/or survey plan	Month 6	Geologist
2	<b>Target delineation</b> a) Geological mapping b) Ground geophysical surveying (magnetic and gravity methods) c) Integration & interpretation of new	Geologist & geophysicist, field officer, laboratory technicians	1 month 3 months  2 months	Geophysical survey data Geophysical 2D model report Targets for drilling Drilling plan	Month 12	Geologist and Geophysicist

	information					
3	<p><b>Testing of targets and initial diamond testing</b></p> <p>a) Detailed geophysical surveying using various techniques (delineation of kimberlites)</p> <p>b) Core drilling (up to 63.5 mm), maximum depth 600 m. Logging of core</p> <p>c) Drill sample analysis (petrography, mineral chemistry, physical properties)</p> <p>d) Possible initial micro diamond sampling and recovery (at least 600kg of sample)</p> <p>e) Integration &amp; interpretation of new information, planning</p>	Geologist, field officer, drill contractors, laboratory technicians, petrologist, geophysicist	<p>2 months</p> <p>3 months</p> <p>3 months</p> <p>3 months</p> <p>1 month</p>	<p>Geological report with drill logs</p> <p>Analytical results of samples, initial micro-diamond stone density</p> <p>Integrate drill data to refine geophysical model</p> <p>Asses if further work may be required</p>	Month 24	Geologist, Petrologist and Geophysicist
4	<p><b>Kimberlite delineation and diamond testing</b></p> <p>a) Detailed ground geophysical surveys &amp;</p>	Geologist, field officer, drill contractors, laboratory	1 month	<p>Initial geophysical pipe shape model</p> <p>Geological report with drill logs, initial 3D</p>	Month 34	Geologist, Geophysicist, Diamond specialist

	modeling b) Core drilling to a maximum of 600 m (3x core holes) c) Drill sample analysis (petrography, density, micro-diamond content) d) Integration & interpretation of new information, planning	technicians, petrologist, micro-diamond specialist, geophysicist	3 month  4 months  2 months	geological model Micro-diamond grade potential estimate Analytical results of samples Mini-bulk sampling plan		and Petrologist
5	<b>Mini Bulk Sampling</b> a) Large diameter drilling to extract approx. 200 tonne sample b) Transport & processing of 200 tonne sample c) Diamond recovery and examination d) Integration & interpretation of new information and planning	Geologist, field officer, drill contractors, laboratory technicians, diamond specialist.	2 months  4 months  3 months  1 month	Analytical results of samples Drill report and initial diamond grade estimate Asses if further work may be required	Month 44	Geologist, Mineral Resource Manager, Advanced Project Manager Diamond specialist



6	<b>Full Bulk Sampling</b> a) Large diameter drilling (2x holes) b) Processing of approximate 400 tonne sample (depends on requirement) c) Micro- and macro-diamond recovery and examination d) Integration & interpretation of new information	Project Manager, Geologists, field officers, drill contractors, laboratory technicians, plant operators, micro-diamond specialist, diamond specialist, mineral resource manager.	4 months 3 months 4 months 4 months	Analytical results of samples Geological report with drill logs, revised model, diamond grade and value estimate Decision on pre-feasibility studies (decision on application for renewal of prospecting right)	Month 59	Project Manager, Advanced Project Manager and Mineral Resource Manager
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### **2.1.1 The main prospecting activities (e.g. access roads, topsoil storage sites and any other basic prospecting design features).**

Access to the site will be by foot and vehicles using existing tracks on the property, thus creating minimal impacts on vegetation. The storage and processing of rock samples will have no impact on the natural environment as it is done off site.

Geological mapping of possible areas of interest is carried out in conjunction with ground geophysical surveys. Geological mapping and geophysical survey work has minimal impact on the environment. Geophysical surveys may be conducted by air (helicopters or fixed wing aircraft) or on the ground. If airborne surveys are planned, surface owners will be consulted beforehand to assess the problems that could arise due to noise, so that the survey plans can be adjusted accordingly.

The method of temporary site marking for ground surveys shall be by means of biodegradable material tied next to survey stations which are removed once the survey is completed. Survey areas will vary between 500m x 500m to 2km x 2km depending on the size of the targeted block, and survey lines will be spaced at maximum of 100m and minimum of 20m interval between the lines. Geophysical surveys are carried out on foot, usually by teams consisting of two people or more. All geophysical instruments are powered by rechargeable batteries and have minimal impact on the environment.

Any rocks that are suspected to be kimberlitic will be collected for petrographic studies. The samples will be collected manually by using geological hammers and would not exceed 2kg in mass. The process has no significant impact on the natural environment.

If the prospecting techniques above indicate that there are kimberlites on the property, small diameter drilling will be conducted to test for their presence and economic potential. Boreholes will be sited on a practical basis, in consultation with the land owner.

Core drilling will be carried out on indicator mineral or geophysical anomalies to test for the presence of kimberlite. The holes may be vertical or inclined, usually at a maximum angle of 60 degrees to horizontal. The borehole depth will be determined by the geologist and will depend on the type of anomaly and geological conditions, including overburden. The diameter of core drilled doesn't usually exceed 120mm and it is determined by factors such as cost, proposed core sampling and purpose. Core holes might also be used as pilot holes for large diameter drilling holes. Core holes allow more accurate determination of geology of the kimberlite.

Core drilling normally uses a truck or trailer mounted rig and compressor, each with its own diesel generated power. No local power sources are used. Drilling is short

term and drilling at any anomaly is usually completed in two weeks or less with core drilling taking up to two months, but this depends on the target.

### **2.1.2 Plan of the main activities with dimensions.**

The plan of completed activities above phases 1 and 2 will be incorporated in the annual progress report. Further plan will depend on the results of the testing of targets as per Table 3 above.

The footprint of each activity is typically as follows:

- Core drilling: 20 x 20 m per site (1 x drillhole)
- Core drilling: 20 x 20 m per site (3 x drillholes)
- Large diameter drilling: 40 x 40 m per site (1 x drillhole: Mini Bulk sampling)
- Large diameter drilling: 40 x 40 m per site (2 x drillholes: Full Bulk sampling)

### **2.1.3 Description of construction, operational, and decommissioning phases.**

No construction will be carried out during prospecting activities.

Operations of the prospecting project are conducted in phases (refer to Table 3 and section 2.1.1 above).

Prospecting activities are in phases where decision to carry on to the next phase is dependent on the outcomes of the previous phase. During the closure phase of the project, a final report outlining work done, results and areal coverage of prospecting activities is submitted to the Department of Mineral Resources in terms of Section 43(4) of the Mineral and Petroleum Resources Development Act 28 of 2002.

A closure plan with description of activities, methods for mitigation, closure costs is submitted with final assessment of environmental management plan and environmental risk report. Monitoring of rehabilitated areas forms part of the decommissioning phase and continues until a closure certificate is obtained.

### **2.1.4 Listed activities (in terms of the NEMA EIA regulations).**

There are no listed activities during the early stages. The phases of work that may include NEMA listed activities are in phases 5 and 6, depending on the scale of any vegetation clearing required or access tracks created, in certain geographical areas of the country. However as this site in general is not a protected or sensitive area and is currently used for commercial farming, no current listed activities have been identified. However the NEMA EIA process will be applied ahead of work in phase 5

and beyond, to ensure that local sensitive sites are avoided and impacts properly managed.

### **2.1.5 Identification of potential impacts**

Refer to the baseline risk assessment, Appendix I

### **2.1.6 Potential impacts per activity and listed activities.**

Please refer to the baseline risk assessment attached as Appendix I. The main impacts of concern across all the work planned are use of resources, damage to vegetation and potential pollution to soil and water. The main activities that can create such impacts are drilling and the use of vehicles and other machinery, in phases 3 to 6 as per Table 3 above.

### **2.1.7 Potential cumulative impacts.**

If a kimberlite is found, the successive phases of work (from 3 through to 6) could create a cumulative impact on vegetation and soil at the much localised site identified, as well as on access tracks where prospecting activities may contribute to creation of dust; in extreme cases dust suppression may be required. Disturbance and removal of soil has the potential to directly and indirectly impact on vegetation in the prospecting area and also impact wildlife by removing habitat that is used for foraging, burrowing/nest, and breeding.

### **2.1.8 Potential impact on heritage resources**

There are no specific heritage aspects identified; the area comprises a privately owned farm used for commercial and game farming purposes; the owners also use the farm for residential purposes. Prospecting activities could impact on graves but usually it is quite practical to stay well away (at least 50 metres) from such sites. Should graves etc. be within an area planned for drilling (from phase 3 onwards), then a Heritage Impact Assessment should be conducted. No graves were reported by the surface owner.

### **2.1.9 Potential impacts on communities, individuals or competing land uses in close proximity.**

There is no community in or near the area and there will be no impact due to close proximity. The area applied for is located 40km north east of Hopetown.

Some impact on land use may be expected from phase 3 onwards, as the damage to vegetation, although limited in spatial extent, will somewhat reduce the grazing

available to the farmers. Noise and dust impacts will be minimal as these are localised to the drill site and access tracks, for a short duration only.

From phase 3 there may also be an impact on the state of farm tracks, when heavier vehicles enter the property. Depending on the sites to be accessed, some impact on gates and fences may also be of concern. Dust and noise will be a concern in this case. Water or soil pollution would have an impact on the farming.

The area is accessed by means of a public road, then by private farm tracks which pass through gates in the fences. Aside from the tracks and fences, there are wind pumps, small reservoirs, sheds/barns, farmhouses and enclosures (kraals) which are of avoidance.

#### **2.1.10 Confirmation that the list of potential impacts has been compiled with the participation of landowners and interested and affected parties.**

The issue of the potential impacts on grazing and environment in general was discussed with the property owners. It was made clear that it will be De Beers' responsibility to rehabilitate drilling sites, including any fencing-off that may be required to achieve this.

The main concerns are generally around safety of the livestock and security. Safety and security concerns will be addressed by controlling access through appointments and by providing the names and ID numbers of staff coming to work on the farms. De Beers's employees must endure to Company rules and policies which state that they may not damage the environment, litter, leave gates open and temper with the livestock. Prospecting activities are conducted during the day. The farmers were also concerned about the impacts prospecting might have on the farmers' livelihood.

Water is a major concern for the land owners. Water will be used for drilling and will have to be sourced either externally or from a strong borehole in the area, provided the water use permission can be obtained from the surface owner. The water sourced from the property is paid at a rate of a litre to the surface owner.

#### **2.1.11 Confirmation of specialist report appended**

If the project progresses to advanced work (phases 4 to 6) it is recommended that Heritage and Archaeological Impact Assessments be carried out for specific sites where large diameter drilling is planned. Should listed activities under NEMA be considered, then specialist studies may be required in support of Basic Assessment or full Environmental Impact Assessment, whichever is required.

### **3 REGULATION 52 (2) (c): Summary of the assessment of the significance of the potential impacts and the proposed mitigation measures to minimise adverse impacts.**

#### **3.1 Assessment of the significance of the potential impacts.**

Please refer to baseline risk assessment of the potential impacts.

##### **3.1.1 Criteria of assigning significance to potential impacts.**

The criteria applied were a combination of severity and probability of the potential impact. Severity was based on how long the impact would last combined with the extent of that impact relative to the site of the specific activity and the property as a whole. Probability was based on the frequency of the activity taking place combined with the frequency of the unwanted event or situation arising, based on normal operations (track record). Note that these ratings are made with existing mitigation considered.

##### **3.1.2 Potential impact of each main activity in each phase, and corresponding significance assessment.**

Please refer to baseline risk assessment in Appendix I and the phases in Table 3 above.

Phase 1 – no impacts.

Phase 2 – impacts on soil and water from vehicle use during access to site, as well as potential fire hazard impacting on vegetation, from vehicles or other accidental causes. These are not rated as significant and will be minimal during this phase.

Phases 3 & 4 – impacts on soil and water from vehicle use during access to site; on soil, water and vegetation from drilling as well as potential fire hazard impacting on vegetation, from vehicles, drill rigs or other accidental causes. Dust and noise will be created but will be fairly minor. These are not rated as significant and will be limited to a small area and short duration during these phases.

Phases 5 & 6 - impacts on soil and water from vehicle use during access to site, including heavy vehicles; on soil, water and vegetation from drilling and plant operation as well as potential fire hazard impacting on vegetation, from vehicles, drill rigs or other accidental causes. Dust and noise generation will be more substantial than in the earlier phases. Although these impacts are not individually rated as significant, their cumulative impact on vegetation at the specific site(s) and on the state of access tracks could be considered significant.

### **3.1.3 Assessment of potential cumulative impacts.**

If a kimberlite is found, the successive phases of work (3 to 6) could create a cumulative impact on vegetation at the specific site(s) involved, as well as on the state of access tracks. This could become significant if not properly managed.

## **3.2 Proposed mitigation measures to minimise adverse impacts.**

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

With reference to Appendix I, although all individual impacts are rated as insignificant, this is because existing mitigation procedures are in place to achieve this rating. These procedures must be followed to avoid these impacts becoming significant.

The potentially significant impacts of advanced drilling & bulk sampling (phases 5 and 6) on the vegetation will require proper management of the specific mitigation required to enable the recovery of the land to allow its original use to resume within a reasonable timeframe.

### **3.2.2 Concomitant list of appropriate technical or management options.**

Existing operational procedures EXP-PR-02, 03 and 06 are attached (Appendix II to IV). These document the requirements for technical actions with regard to the different activities. With regard to the potentially significant impact on vegetation in phases 5 and 6 of the work programme, the rehabilitation procedure EXP-PR-06 is most relevant (Appendix IV).

### **3.2.3 Review the significance of the identified impacts**

Provided that the relevant procedures are followed, the significance of all impacts should be low as per Appendix I.

## **4 REGULATION 52 (2) (d): Financial provision.**

### **4.1 Plans for quantum calculation purposes.**

This application is not for mining. As prospecting takes a phased approach, no plans can be provided in this regard.

### **4.2 Alignment of rehabilitation with the closure objectives.**

The rehabilitation actions form part of each operational phase of prospecting. This ensures that should prospecting stop at any stage, based on the results not being encouraging, the initial physical rehabilitation work has already been completed. Thereafter only monitoring and remedial actions, if required, will need to be carried out to obtain the closure objectives.

### 4.3 Quantum calculations.

Calculation of the quantum of the financial provision required to manage and rehabilitate the environment, in accordance with the guideline prescribed in terms of regulation 54 (1) in respect of each of the phases are summarised below:

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	10.87	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	151.42	1	1	
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	223.14	1	1	0
3	Rehabilitation of access roads	m2	0.00	27.1	1	1	0
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	262.98	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	143.45	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	302.83	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	158747.3	1	1	0
7	Sealing of shafts adits and inclines	m3	0	81.29	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	105831.5	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	131811.2	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	382842.3	1	1	0
9	Rehabilitation of subsided areas	ha	0	88617.95	1	1	0
10	General surface rehabilitation	ha	0.64	83836.41	1	1	53655.30
11	River diversions	ha		83836.41	1	1	0.00
12	Fencing	m	0	95.63	1	1	0.00
13	Water management	ha	0	31876.96	1	1	0.00
14	2 to 3 years of maintenance and aftercare	ha	0	11156.92	1	1	0.00
15 (A)	Specialist study	Sum	0			1	0.00
15 (B)	Specialist study	Sum				1	0.00
						Sub Total 1	53655.30
1	Preliminary and General		6438.636288			weighting factor 2 1	6438.64
2	Contingencies			5365.53024			5365.53
						Subtotal 2	65459.47
						VAT (14%)	9164.33
						Grand Total	74624

- Phase 1 – no costs (desktop work)
- Phase 2 – no costs (surficial sampling and geophysical survey work)
- Phase 3 – narrow diameter drilling requires cleaning up of chips/tailings and capping of hole.



- Phase 4 – narrow diameter core drilling with sumps requires cleaning up of spoil, capping of hole, refilling of sumps and levelling topsoil.
- Phase 5 and 6 – large diameter drilling requires sumps cleaning up and capping of the hole, refilling and levelling topsoil.

A financial provision of R 74,624 is calculated.

Note:

Activity	Surface area affected	Number of drillholes	Hectares
Core drilling	20m x 20m	1	0.04
Core drilling	20m x 20m	3	0.12
Large diameter (Mini Bulk Sampling)	40m x 40m	1	0.16
Large diameter (Full Bulk Sampling)	40m x 40m	2	0.16
			<b>0.64 ha</b>

As per the quantum calculator the total surface area affected is 0.64 ha. All phases of prospecting activities have been included in the quantum calculation. The prospecting activities are in stages and result driven where one stage of work is dependent on the result of the previous stage (refer to PWP). The quantum of this provision will be reviewed annually as required and adjusted should the project progress beyond phase 6 or should the planned scope of work change.

During Phase 1 to 4 the following apply:

- Minimal access road opening, generally use existing tracks.
- Mainly rehabilitating drill sites or excavations.
- Monitoring of borehole site every 6 month until DMR inspection. If DMR is satisfied it will grant closure certificate.
- HIA studies to be conducted once per drilling site.
- Botany study to be carried out where 50% of the vegetation is threatened (protected)
- Water quality will be tested before and after extensive drilling if the drilling is conducted in close proximity to the water bodies.

#### **4.4 Undertaking to provide financial provision.**

The required financial provision of R 74,624 for phases 1 to 6 of the work programme, during the first two years of prospecting activities, will be provided in the form of a bank guarantee, through Standard Bank Kimberley, should this prospecting right be granted.

Consultation with the surface owners and review of existing information including satellite imagery (Figure 3) over the area did not reveal legacy environmental liabilities and thus no anticipated cumulative impact have been catered for in the financial provision calculations.

**PLAN AS REFERRED TO IN REGULATION 2.2 IN FORCE IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (28 OF 2002).  
IN SUPPORT OF AN APPLICATION FOR A PROSPECTING RIGHT IN TERMS OF SECTION 16 OF THE AFORESAID ACT.**

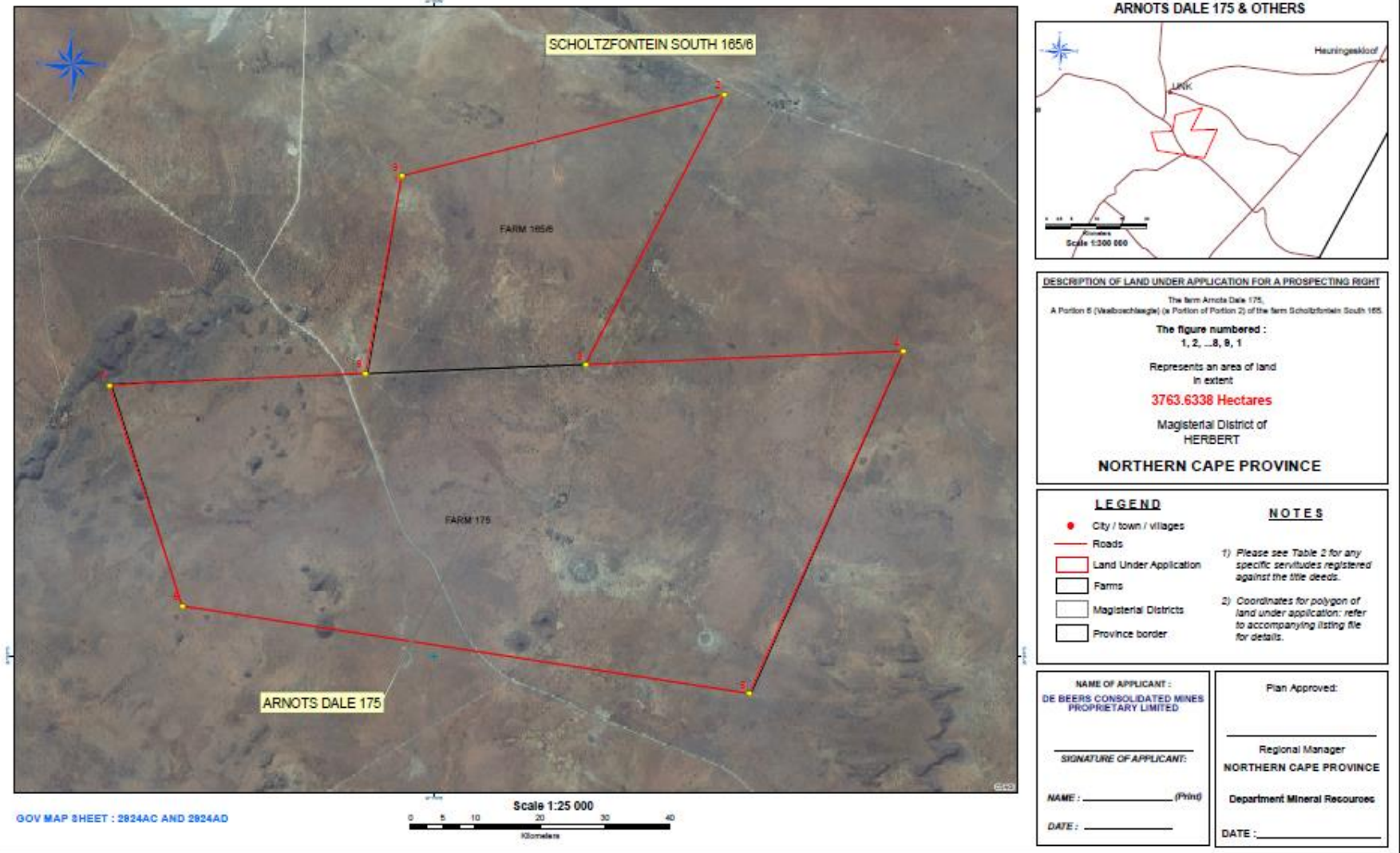


Figure 3: Google Earth satellite imagery for the land under application.

## **5 REGULATION 52 (2) (e): Planned monitoring and performance assessment of the environmental management plan.**

### **5.1 List of identified impacts requiring monitoring programmes.**

Damage to vegetation and tracks will require monitoring, thus drill sites will be monitored to observe the growth of vegetation, and to ensure that the area is safe, stable, non-eroded and in a state that is usable for grazing or any agreed final land use post drilling.

### **5.2 Functional requirements for monitoring programmes.**

Site visits by the project geologist and/or environmental officer will be required. Photographic evidence will be used to document the state of drilling sites and access tracks.

### **5.3 Roles and responsibilities for the execution of monitoring programmes.**

The environmental officer must check on the state of rehabilitation of drilling sites and access tracks, either in person or based on photographs of the sites combined with contact with interested and affected parties.

### **5.4 Committed time frames for monitoring and reporting.**

Routine monitoring and reporting will take place at six monthly intervals. The results of this work will be incorporated in the annual assessment report for this Environmental Management Plan.

Should a problem of invasive plants arise, specific monitoring and remedial actions to deal with this will take place on an annual basis as per the procedure EXP-PR-06 (Appendix IV).

## **6 REGULATION 52 (2) (f): Closure and environmental objectives.**

### **6.1 Rehabilitation plan (areas and aerial extent of the main prospecting activities, including the anticipated prospected area at the time of closure).**

If the project is planned to progress further, any locality map showing location of the prospecting activities will be provided in the annual progress report and Assessment of Environmental management plan. Considering the low impact of the prospecting activities conducted to date, no additional rehabilitation work is required. The rehabilitated drill sites to ensure the area is safe, stable, non-eroded and in a state that is usable for grazing or any agreed final land use post drilling.

## **6.2 Closure objectives and their extent of alignment to the pre-mining environment.**

Early phase activities (phases 1 & 2) cause no or little disturbance to the existing land use. As the project advances to the next stages with minimal disruption to the environment, the closure objective is to ensure that the rehabilitated area is re-vegetated (and/or soil erosion measures), safe, stable, non-polluting, non-eroded and in a state that is suitable for the grazing and other existing land use.

## **6.3 Confirmation of consultation.**

The post-prospecting land use has been discussed with the land owner and the aim is to continue with game and commercial farming on the property, unless an application for a mining right is to be made. The surface owners did not report any other plans for developing the land use.

## **7 REGULATION 52 (2) (g): Record of the public participation and the results thereof.**

Please note that the full report on public participation was submitted on the 18<sup>th</sup> of November 2014. The information submitted in the full report is repeated below for ease of reference. All supporting documentation forms part of the attached full report (Appendix V).

### **7.1 Identification of interested and affected parties.**

All affected and interested parties were consulted and involved during the process with regard to the proposed prospecting activities.

#### **7.1.1 Identification of community.**

There is no community present on or adjacent to the site. This was confirmed by asking the farm owners. Only farmworkers and their respective families reside on the farm.

#### **7.1.2 Community as landowner.**

There is no community present; this was confirmed by asking farm owners.

### 7.1.3 Land Affairs notification.

A letter was hand delivered to Land Affairs (Rural Development and Land Reform) on the 15th October 2014, and no response has been received to date. Farmers confirmed that none of the workers have residential rights.

### 7.1.4 Land claims.

### 7.1.5 Traditional Authority.

There is no traditional authority identified as there is no community onsite and adjacent areas.

### 7.1.6 Landowners

HERBERT DISTRICT, NORTHERN CAPE PROVINCE NC 30/5/1/1/2/11445 PR					
	FARM	PTN	SURFACE OWNER	SURFACE TITLE	AREA (Ha)
1	Scholtzfontein South 165 (Vaalboschlaagte)	6	Johann Sonnekus Kindertrust (JW Sonnekus)	T1200/2001	850.0389
2	Arnotsdale 175	Farm	Arnotsdale Boerdery cc (GJD Scholtz)	T3801/1997	2913.5949

### 7.1.7 Lawful occupiers of the land.

Same as listed in 7.1.6.

### 7.1.8 Whether other persons' socio-economic conditions will be affected.

All interested and affected parties were consulted. Main access to the farms is by means of gravel public road, then private farm tracks which pass through gates in the fences, so there is no reason for the proposed prospecting to directly impact on their socio-economic conditions. Prospecting operations may create a limited amount of noise and dust, but this will be limited to parts of the properties where drilling takes place. Provided that the usual precautions are taken to avoid disruption to ground water and to prevent fires, there should be no impact by the prospecting on their socio-economic conditions.

**7.1.9 Local Municipality.**

Siya Temba Local Municipality; Herbert District of Northern Cape Province.

**7.1.10 Relevant government departments, agencies and institutions.**

Department of Mineral Resources

Land Claims Commissioner

Department of Rural Development and Land Reform

South African Heritage Resources Agency

Department Tourism Environment & Nature Conservation

Siya Temba Local Municipality

Government Departments	Contact details
Department of Mineral Resources	Regional Manager Northern Cape Region Department: Mineral Resources Private Bag X60 KIMBERLEY 8301
Department of Land Affairs	New Public Building 6th Floor, Cnr Knights and Stead Street KIMBERLEY 8301 E-MAIL: <a href="mailto:OBMVULA@ruraldevelopment.gov.za">OBMVULA@ruraldevelopment.gov.za</a> FAX: 053 832 8137
South African Heritage Resources Agency	Head Office 111 Harrington Street CAPE TOWN 8001
Department Tourism Environment & Nature Conservation	MetLife Towers 4th Floor C/O Market Square and Stead KIMBERLEY 8301 E-MAIL: <a href="mailto:bbotes@ncpg.gov.za">bbotes@ncpg.gov.za</a> FAX2EMAIL: 086 625 6470
Land Claims Commissioner	4 - 8 Main Road Hyesco Arcade Building KIMBERLEY 8301 E-MAIL: <a href="mailto:RBaulackey@ruraldevelopment.gov.za">RBaulackey@ruraldevelopment.gov.za</a> FAX: (053)831-6501
Siya Temba Local Municipality	The Municipal Manager Siya Temba Local Municipality Siya Temba Local Municipality P.O. Box 16 Prieska 8940 E-MAIL: <a href="mailto:mm@siyathemba.co.za">mm@siyathemba.co.za</a> FAX: 053 353 13860

### 7.1.11 Proof of notification.

Please refer to the attached report on consultation, which includes summary of the consultation and minutes of the meetings. All correspondence that took place since the first submission will also be attached.



## **7.2 The details of the engagement parties.**

### **7.2.1 Description of the information provided to the community, landowners, interested and affected parties.**

An introductory letter was sent to all parties and responses requested. A meeting was held on the 14<sup>th</sup> November 2014 with landowners only. The minutes of this meeting and the presentation given are attached on the full consultation report.

### **7.2.2 List of which parties identified in 7.1 above that were in fact consulted, and which were not consulted.**

All landowners listed in 7.1.6.

All Government departments listed above (7.1.10) were notified.

### **7.2.3 List of views raised by consulted parties regarding the existing cultural, socio-economic or biophysical environment.**

There is a concern about safety of livestock and impacts of prospecting on the farmers' livelihood. Groundwater is also a concern of the surface owners as the groundwater is very limited to some of the properties. This means that any water to be used for drilling will have to be sourced either externally or only from the stronger boreholes in the area, provided the required water use permissions can be obtained from the surface owner. Ground water pollution must be avoided through the use of only environmentally friendly drilling additives and the proper closing of boreholes on completion.

### **7.2.4 List of views raised by consulted parties on how their existing cultural, socio-economic or biophysical environment potentially will be impacted on by the proposed prospecting or mining operation.**

See 7.2.3 above, these same concerns apply to impacts of prospecting activities.

### **7.2.5 Other concerns raised by the aforesaid parties.**

The farmers are concerned about the issue of access to the farms and safety (security) and impacts of prospecting on the farming activities and that they should be notified prior to coming to the farms. Security concerns will be addressed by controlling access through appointments and by providing the names and ID numbers of staff coming to work on the farms. The following concerns were raised by farmers:

- Impact of prospecting on farming and the farmer's livelihood.
- Compensation by De Beers during prospecting.

#### **7.2.6 Confirmation that minutes and records of the consultations are appended.**

Consultation letters were sent during October 2014 to:

- Farm owners
- Government parties

A meeting was held on the 14th November 2014. (All minutes and presentation are also appended to the full consultation report as annexures D to F).

#### **7.2.7 Information regarding objections received.**

No specific objections were raised to date although the surface owners are concerned about their safety and impacts of prospecting activities on their farms.

#### **7.2.8 The manner in which the issues raised were addressed.**

In terms of the safety, security/ access concerns, De Beers will send the names and ID numbers of all the people beforehand and inform the surface owners of the exact dates they will be present on the farm.

In terms of loss of animals due to leaving gates opened; this issue will be addressed by briefing De Beers's employees on the consequences and implications of negligence when working in the property.

The procedures referred to in this Environmental Management Plan aim to minimise the impact on the environment. These include measures to avoid pollution of the local water supply.

Use of water from the farms will only be considered should approval be obtained from surface owner only if there is sufficient supply to allow the normal farming activities to continue.

Other aspects to be addressed in all our prospecting work (although not raised directly) through the Environmental Management Plan include:

- Avoiding soil pollution - preventing and controlling oil or hydraulic fluid spills.
- Avoiding grass fires - no fires to be used when prospecting, precautions and controls in place for machinery.

- Avoiding littering - proper waste removal and disposal to be practiced.
- Minimising vegetation destruction - by limiting the creation of new tracks, clearing minimal areas for drilling and rehabilitating effectively. Disturbed areas may need to be fenced off to allow vegetation recovery.
- Avoiding excessive noise & dust - this will require specific measures depending on the nature of work. Prospecting is mostly restricted to daylight hours so noise will be limited to these periods. Dust suppression measures can be taken where this is a problem.
- Impact on fauna - as prospecting takes place in a limited area for a relatively short duration, impacts on fauna will be minimal.

Access and use of contracts will be provided to owners on request.

## **8 SECTION 39 (3) (c) of the Act: Environmental awareness plan.**

### **8.1 Employee communication process.**

All employees and contractors must be inducted in the environmental management system, which explains the potential risks associated with the various prospecting activities. This is a requirement of the system itself (ISO 14001 certified). The material is provided in paper form but also discussed verbally to ensure clarity.

### **8.2 Description of solutions to risks.**

Each activity and associated risks is linked in the baseline risk assessment to relevant mitigation measures to prevent pollution and other significant impacts. The compliance to procedures is the duty of all staff and contractors. This is monitored by supervisors and reported to the management team as well as the environmental officer.

### **8.3 Environmental awareness training.**

The training comprises of the following:

- General induction to the environmental management system including the aspects and impacts register.
- Activity specific induction, based on procedures, including emergency response on spill handling (use of spill kits etc.).
- On site confirmation of these procedures, with demonstrations of requirements.
- Periodic awareness sessions (toolbox talks) on safety, health and environmental topics.

**9 SECTION 39 (4) (a) (iii) of the Act: Capacity to rehabilitate and manage negative impacts on the environment.**

**9.1 The annual amount required to manage and rehabilitate the environment.**

There is no a fixed annual amount. The amount is calculated to address the rehabilitation needed at each phase. This can only be estimated at this stage – with a fair degree of accuracy for the first three years only. If all work is conducted according to the planned timeframe, this will equate as follows:

- Year 1 to Year 2: R 4,664 (determined as per section 4.3 above assuming 1 core hole)
- Year 3: R 13,992 (determined as per section 4.3 above assuming 3 core holes)
- Year 4: R 18,656 (determined as per section 4.3 above assuming 1 LDD hole)
- Year 5: R 37,312 (determined as per section 4.3 above assuming 2 LDD holes).

**9.2 Confirmation that the stated amount correctly reflected in the Prospecting Work Programme as required.**

The amounts stated in the work programme include the above costs of such rehabilitation work as part of each phase of work. The approach taken is to include such rehabilitation and the cost thereof as part of the planned work and thus as part of the budget submitted.

**10 REGULATION 52 (2) (h): Undertaking to execute the environmental management plan.**

Herewith I, the person whose name and identity number is stated below, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises EIA and EMP compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.

Full Names and Surname	Anette Basson
Identity Number	5807310083087

**-END-**