



**mineral resources**

Department:  
Mineral Resources  
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: Tundratype ( Pty) Ltd

REFERENCE NUMBER: NC 30/5/1/1/2/10942 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.**

<b>ITEM</b>	<b>COMPANY CONTACT DETAILS</b>
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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.

### Status of the cultural environment that may be affected

The Namaqualand copper mines and their associated infrastructure and cultural landscape reflect the beginnings of the mining industry in South Africa in all the myriad ways in which that industry influenced and continues to influence society through the movement and housing of people, the development of transport and other infrastructure and industries and in the development of technological and scientific endeavour.

It also reflects the very close links between the development of the Southern African mining industry and mining technology pioneered in Britain, particularly in the counties of Cornwall and Devon, and the landscapes and social structures that went with them.

In its socio-cultural aspects, the Namaqualand copper mines saw the development of the first company towns of the industrial era in South Africa and the movement of people from various parts of the Cape Colony to Namaqualand to provide labour and to serve the trade that developed here. As importantly, the development of the copper mines was undertaken using British technology developed on the mines of Cornwall and West Devon and in fact the development of the mines around O'okiep contributed significantly to the demise of copper mining in south-west of England, with the resulting transfer not only of technology and skills, but also of numbers of Cornishmen to Namaqualand and other parts of the world. There is and remains a strong historical connection between these two great former copper producing regions of the world. As such it is anticipated that the Namaqualand Copper Mining Landscape will be nominated as an extension of the Cornwall and West Devon Mining Landscape World Heritage Site along with similar sites that share the same connection in Mexico, Australia, Brazil and India.

Any form of mining or prospecting will therefore be a continuation of the socio-cultural aspects of the area.

### Status of any heritage environment that may be affected

With regard to sites of archaeological interest the proposed prospecting operation will mainly consist of non-invasive activities with limited drilling. The possibility to unearth any fossils or artefacts is therefore zero and given the high cost of a visit to this site, no first phase paleontological assessment is deemed necessary. No other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves of victims of conflict, and cultural landscapes or viewsapes are present on the prospecting area applied for.

### Status of any current land uses and the socio-economic environment that may be directly affected

Approximately 90% of the region is used for livestock grazing and production, with the remainder comprising of agriculture and urban development. Tourism is a seasonal but rapidly growing feature – with visitors to the region arriving almost exclusively between July and October in order take in the world renowned yearly

flower display. Urban development is not a major feature of the landscape, and is not expected to increase much in the coming years.

Prospecting will only be a temporary land use where after land use will revert back to the pre-mining land use grazing. Productivity of the land with regard to land use is very low and prospecting will have no impact on the productivity of the area. Productivity of the land with regard to land use is very low and prospecting will have no impact on the productivity of the area. Most of the Northern Cape is defined as vacant or unspecified land use (Refer Map 1).

#### Status of any infrastructure that may be affected

No infrastructure will be affected as only limited drilling will take place. Existing roads and tracks will be used and in the case of new tracks be developed it will be addressed at final closure and rehabilitation.

#### Status of the biophysical environment that may be affected

##### **Topography**

Namaqualand is a unique and diverse environment – owing in large part to the presence of four distinct biogeographically regions within its boundaries. The Orange River valley lies to the north and is characterized by very dry desert conditions. In the west the area is composed of coastal plains – which transition into granite hills that straddle the escarpment, before transforming into low lying Bushmanland plains to the East. The site is located within an area known as the Namaqualand Klipkoppe. The topography of the area is dominated by low mountains (Refer Map 2).

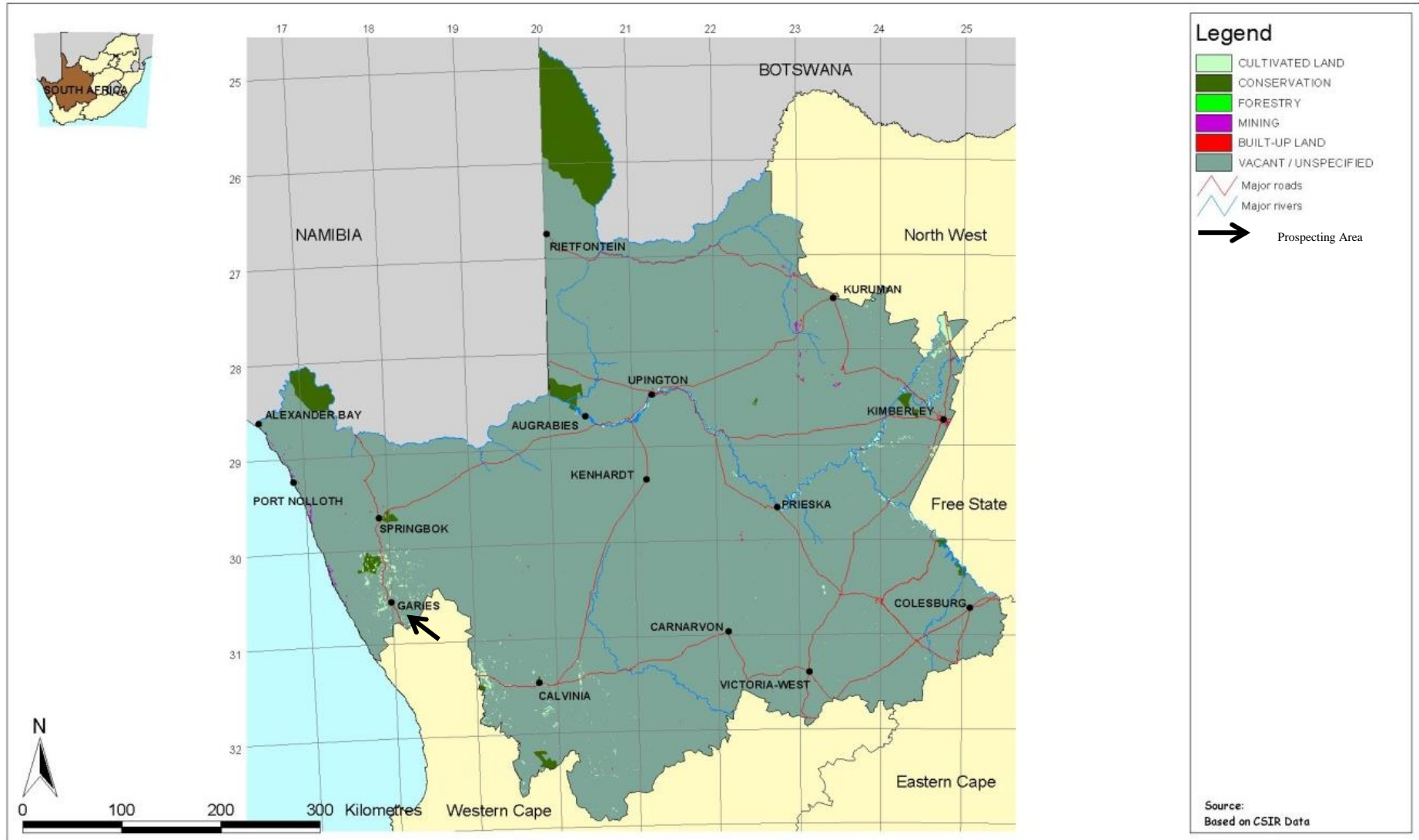
##### **Soil**

The soils in a regional context are reddish, moderately shallow, sandy, and often overlay layers of calcrete of varying depths and thickness. The soils are typically weakly structured with low organic content. These soils drain freely which results in a soil surface susceptible to erosion, especially wind erosion when the vegetation cover is sparse and gulley erosion in areas where storm-water is allowed to concentrate. The soils in the area are generally not suitable for dry land crop production and the only area where intensive crop cultivation is feasible is along the Orange River where irrigation is possible therefore the pre-prospecting land capacity is categorized as Class III grazing land. The productivity of the area is very low at 8Ha/SSU.

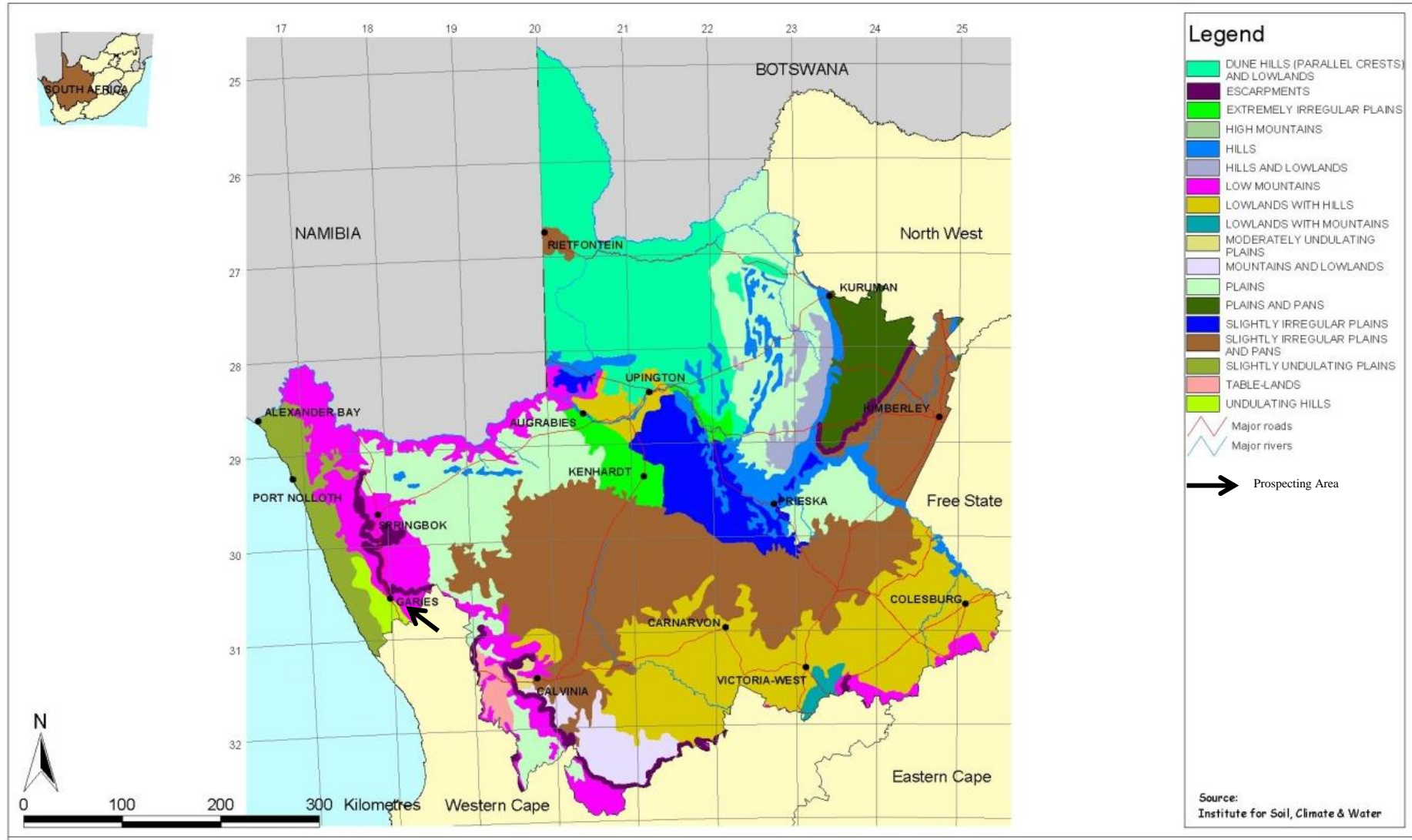
The prospecting area has been classified into the following classes of land capability:

Arable land:	0 %
Grazing land:	80%
Wetland:	0 %
Wilderness land:	0 %
Urban and mining	20%

Map 1: Land use patterns of the Northern Cape



Map 2: Terrain Morphological units of the Northern Cape



## Plant Species

The Namaqualand Klipkoppe Shrubland of which the prospecting area forms part has 15 endemic plant species. The Namaqualand Klipkoppe Shrubland (SKn 1) and the Kamiesberg Mountain Shrubland vegetation types are structurally very similar, and also share a lot of species. Typically Kamiesberg Mountain Shrubland occurs at higher elevations (900–1300m) than Namaqualand Klipkoppe Shrubland (<600 – 1300m), or in moister situations, such as on south and east facing slopes or in the western part of the Kamiesberg. A significant number (>15) of endemic species occur primarily or wholly within these two vegetation types, but as noted, this may be partly a function of insufficient habitat or locality information, and also partly a function of the physical extent of these two vegetation types, which cover very large areas in Namaqualand.

Namaqualand Klipkoppe Shrubland fades into various forms of Succulent Karoo at lower elevations, and on the dry eastern fringes of the Kamiesberg (at the relatively high altitude of 1000m) changes into Platbakkies Succulent Shrubland (and Blomveld). In all situations the Shrubland vegetation occurs in rocky areas, with relatively shallow soils. In areas where deeper soils are found it changes to Renosterveld (above about 1000m, and where there is enough moisture), or to Blomveld (in drier situations, or below about 1000m). Typical species in the Shrubland vegetation include *Rhus undulata* (taaibos), *Rhus horrida*, *Lebeckia sericea* (fluitjiesbos), *Didelta spinosa* (perdebos), *Pteronia incana* (asbos), *Pentzia incana* (ankerkaroo), *Euphorbia mauritanica* (melkbos), *Zygophyllum morgsana* (slaaibos), *Cotyledon cuneata* and *C. orbiculata* (plakkies), and *Ruschia* spp. *Ozoroa dispar* (resin tree) and *Aloe dichotoma* (kokerboom) are useful indicators of Klipkoppe Shrubland, and seldom occur in Kamiesberg Shrubland. *Elytropappus rhinocerotis* (renosterbos) may be present in Kamiesberg Shrubland, but is never dominant, and is not present in Klipkoppe Shrubland.

## Animal Life

Endemism rates for invertebrates are high, and many unique and remarkable adaptive insects can be found in this region, including the scorpion – of which 22 are already known to be endemic to the NDM. Likewise, there is an abundance of reptiles and snakes in the region, many of which are near endemic (including the Namaqua dwarf adder, which is the smallest of Africa's adders, measuring between 20-25 cm), as well as a few unique frogs such as the endemic rain frog, the marbled rubber frog and the paradise toad. Larger herbivores are absent due to the altered habitat and competitive land uses.

## Surface Water

The prospecting area included a few intermittent streams that form the top catchment area of the Groen Rivier but no drainage channels occur within the prospecting area and there is no dendritic system which could be disturbed. Surface water only accumulates in the drainage channels after exceptional good rains. Given the variability of semi-arid rainfall, the calculation of the mean annual runoff (MAR) would be of no use. The MAR is in any event very low given the low rainfall less than 200 mm per year occurring mainly in the winter months, high evaporation rates, and shallow grade of the slope toward the drainage channels and the permeability of the soils

The surface water quality (when available) is suitable for animal consumption but not for potable water.

### **Groundwater**

The majority of municipalities and towns rely on groundwater or local water resources to supply the town with drinking water. Thus, the higher rainfall areas are key recharge zones for these groundwater resources. Consequently, land use management of these catchment areas is critical for the maintenance of the quality and quantity of water sourced from each area. For example, water courses and wetlands that have been cleared for agricultural purposes, or overgrazed, will not only cause soil erosion, but most importantly cause increased water runoff, thus reducing the amount of water that feeds back into the water table for consumption.

The average water level measured at 'rest' in the region is about 80m depending on the season. No water will however be used during the prospecting operation and if this change water will be bought from the local authority or obtained from one of the farms.

### **Air Quality**

The air background quality in Namaqualand is very good due to low industrial activity and very low population density. Given the surrounding extent of semi-desert, dust generation is high under windy conditions (dust storm) however under normal conditions no extreme dust conditions are noted on site.

### **Noise**

Background noise level is the same as for other small settlements. On portions of the prospecting area noise is generated by earth moving equipment and machinery and at present such noise levels are low (observed estimate at  $\pm 55$  dBA).

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

#### Description of potential impacts identified on the cultural heritage environment

Prospecting will mainly consist of non-invasive work with limited drilling and soil sampling and given the extent of the mining activities on site to date no phase 1 archaeological study is deemed necessary.

The area has very little potential to contain microfossils and as the rocks have been highly metamorphosed there is very little chance of fossils being preserved in these rocks. No fossils have yet been reported in any of the mining operations and there is very little chance of fossils being present on the site. Should any fossils be discovered or unearthed in the process of prospecting, the prospecting right holder will contact a South African Museum or University which employs palaeontologists so that the necessary palaeontological salvage operations can take place. No other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or views are present on the mining area.

#### Description of potential impacts identified on the socio- economic conditions

Potential impacts arise as follows through the proposed prospecting activities:

##### Negative

- Potential impacts on farm integrity: Poaching, stock theft, stock loss (through road kill or gates being left open), security, and road condition deterioration
- Potential impacts on rural settlements: Raise false levels of expectancy, economic concerns if mine / prospect labour are paid more than farm labour, immigration of workers, drugs etc.



#### Positive

- Potential for infrastructure development
- Potential for employment opportunity.

Note that should mining go ahead as a result of positive prospecting results then a social and labour plan is required which will address amongst other aspects, the above issues in more detail.

The only other land use in the area is small stock grazing and due to the small extends of the prospecting operation there will be no impact on productivity.

#### Description of potential impacts identified on: employment opportunities, community health, and community proximity

The prospecting operation itself will not create many employment opportunities but if economic viable ore bodies are discovered the spinoffs due to the larger mining operation will contribute to employment and skills development.

#### Description of potential impacts identified on the biophysical environment

Prospecting will mainly consist of non-invasive field work with limited drilling and soil-sampling less than 25 Kg per sampling site and the overall impact on the biophysical environment will be insignificant. The implementation of the mitigating and management measures in paragraph 3.2 will address all impacts and after implementation of the mitigating measures most impacts can be classified as insignificant.

#### **Drilling**

Drilling will have an insignificant impact on the geology as borehole collars will remain. No backfilling will take place therefore mixing of the geological sequence of sediment will not occur.

Due to the shallow nature of operations the impact on the groundwater is considered insignificant. The absence of a waste handling program can however have a significant impact through oil and fuel spills and soil contamination. No process water will be used during prospecting operations or will be purchased from the local authority if needed.

#### **Metallurgical Sampling**

The small volume of soil and stream sampling less than 25Kg per site without the possibility of backfilling will have an insignificant negative impact on the visual aspect of the topography.

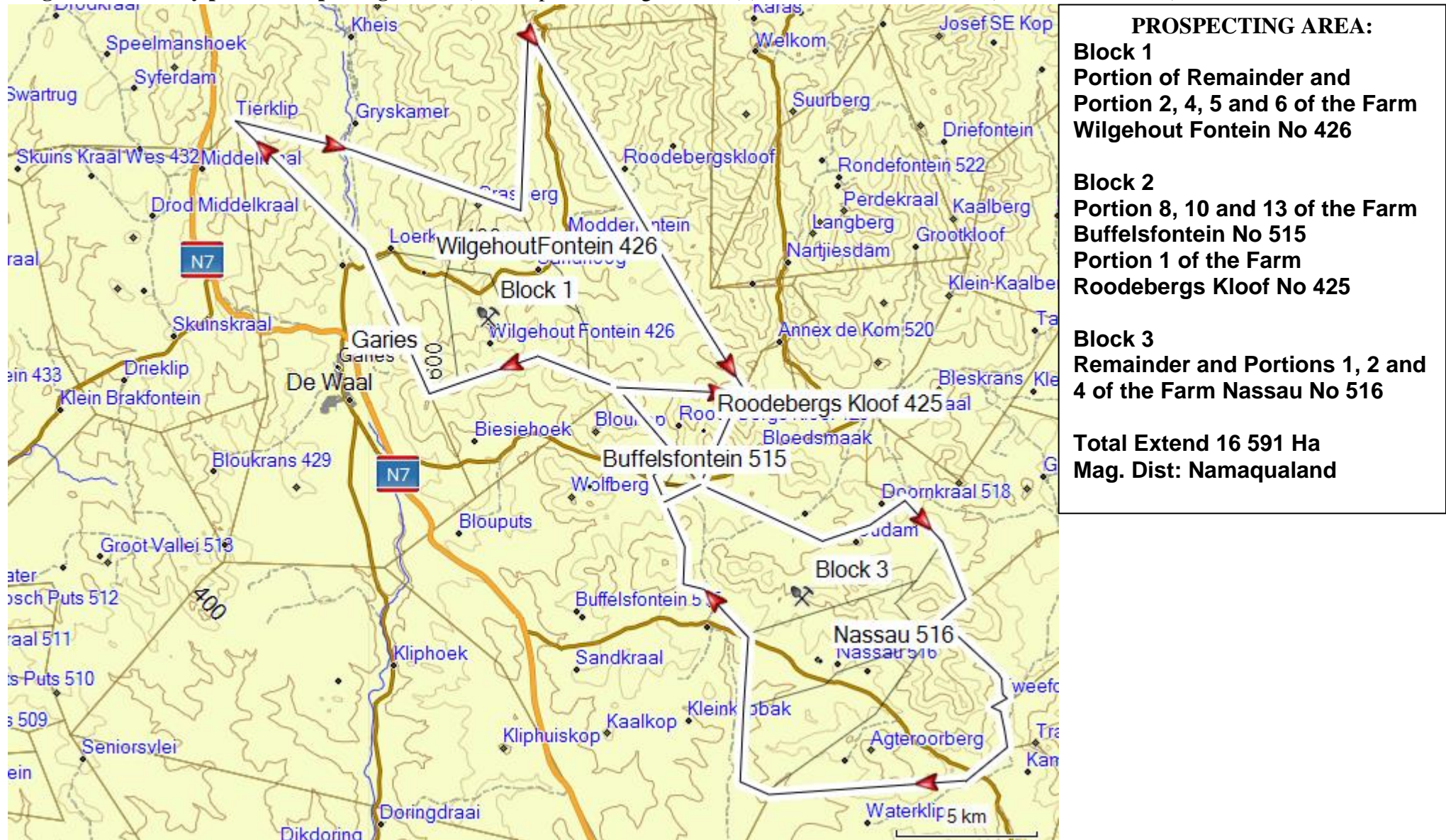
This impact assessment only deals with significant impacts and as prospecting will mainly consist of non-invasive field work with limited drilling and soil-sampling less than 25 Kg per sampling site the overall impact on the biophysical environment will be insignificant. The implementation of the mitigating and management measures prescribed in the EMP will address all impacts and after implementation of the mitigating measures most impacts can be classified as insignificant.

#### 1.3 Confirmation that the description of the environment has been compiled with the participation of the community, the landowner and interested and affected parties,

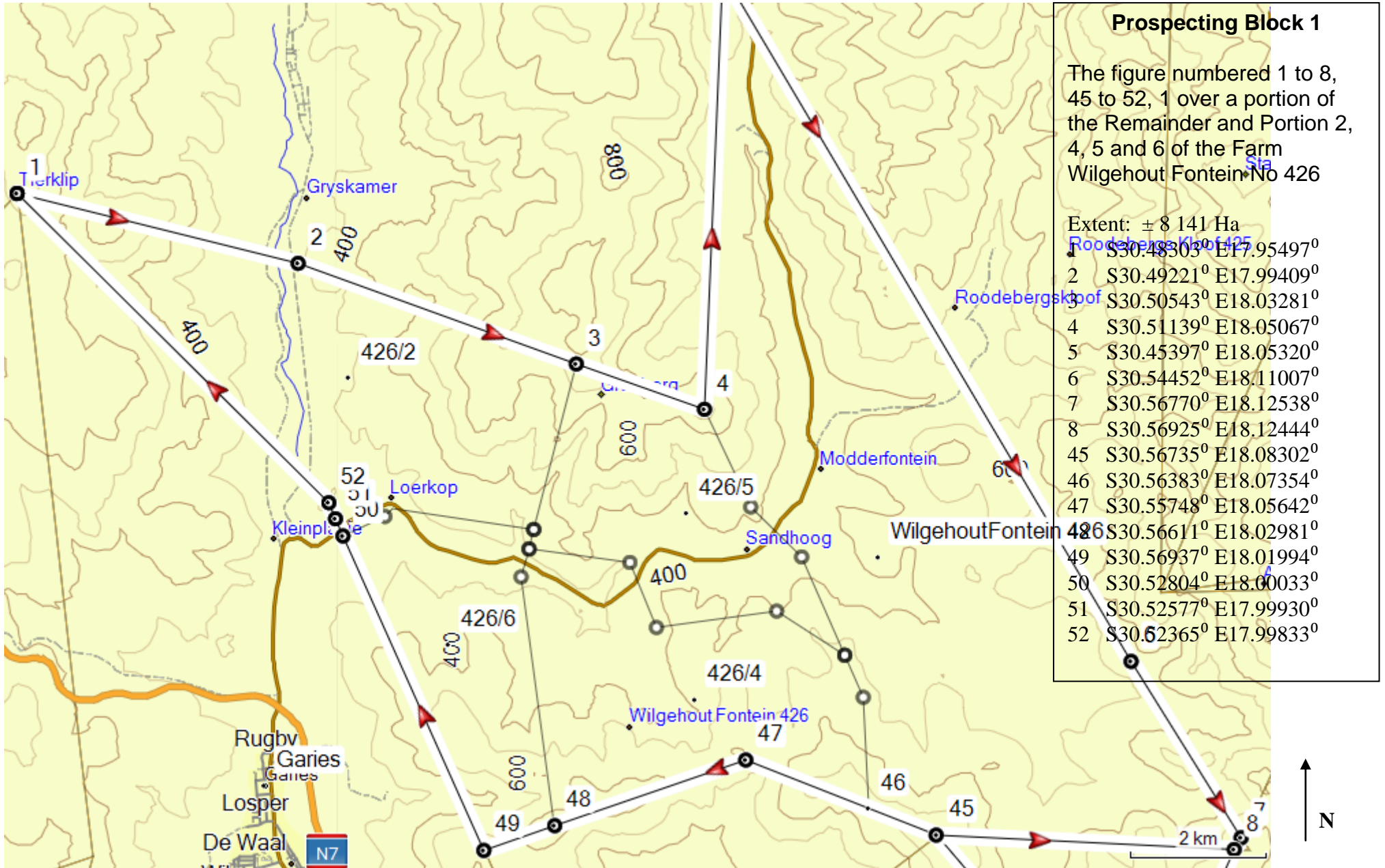
The consultation report was made available to the landowners and all other interested parties for comment. All comments received were addressed in this EMPR.

1.4 Maps showing the spatial locality of all environmental, cultural/heritage and current land use features identified on site.

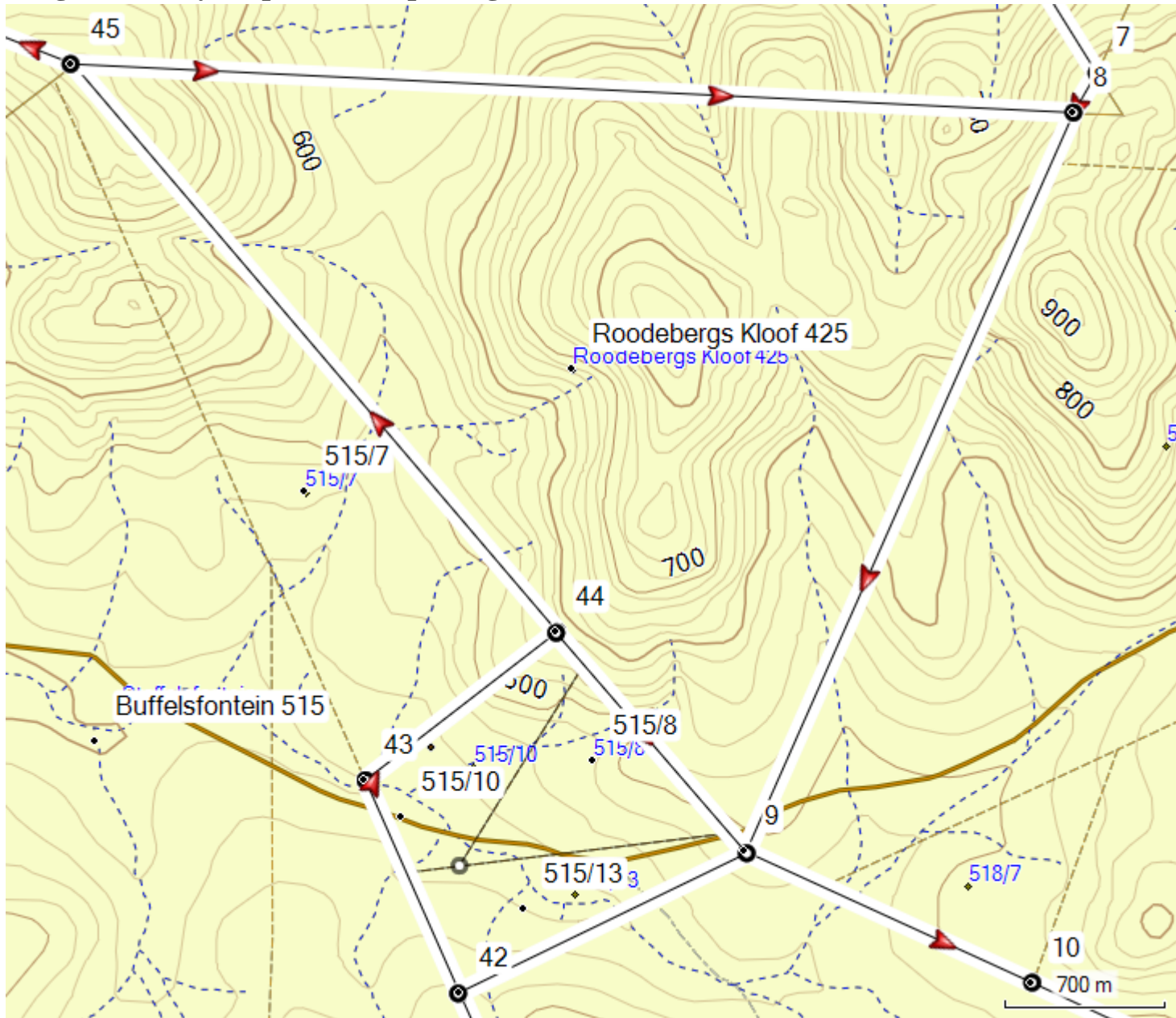
**Diagram 1: Locality plan – Prospecting Blocks** (contemplated in regulation 2(2) of the MPRD Act, 2002 (Act No. 30 of 2002))



**Diagram 2: Layout plan – Prospecting Block 1** (contemplated in regulation 2(2) of the MPRD Act, 2002 (Act No. 30 of 2002))



**Diagram 3: Layout plan – Prospecting Block 2** (contemplated in regulation 2(2) of the MPRD Act, 2002 (Act No. 30 of 2002))



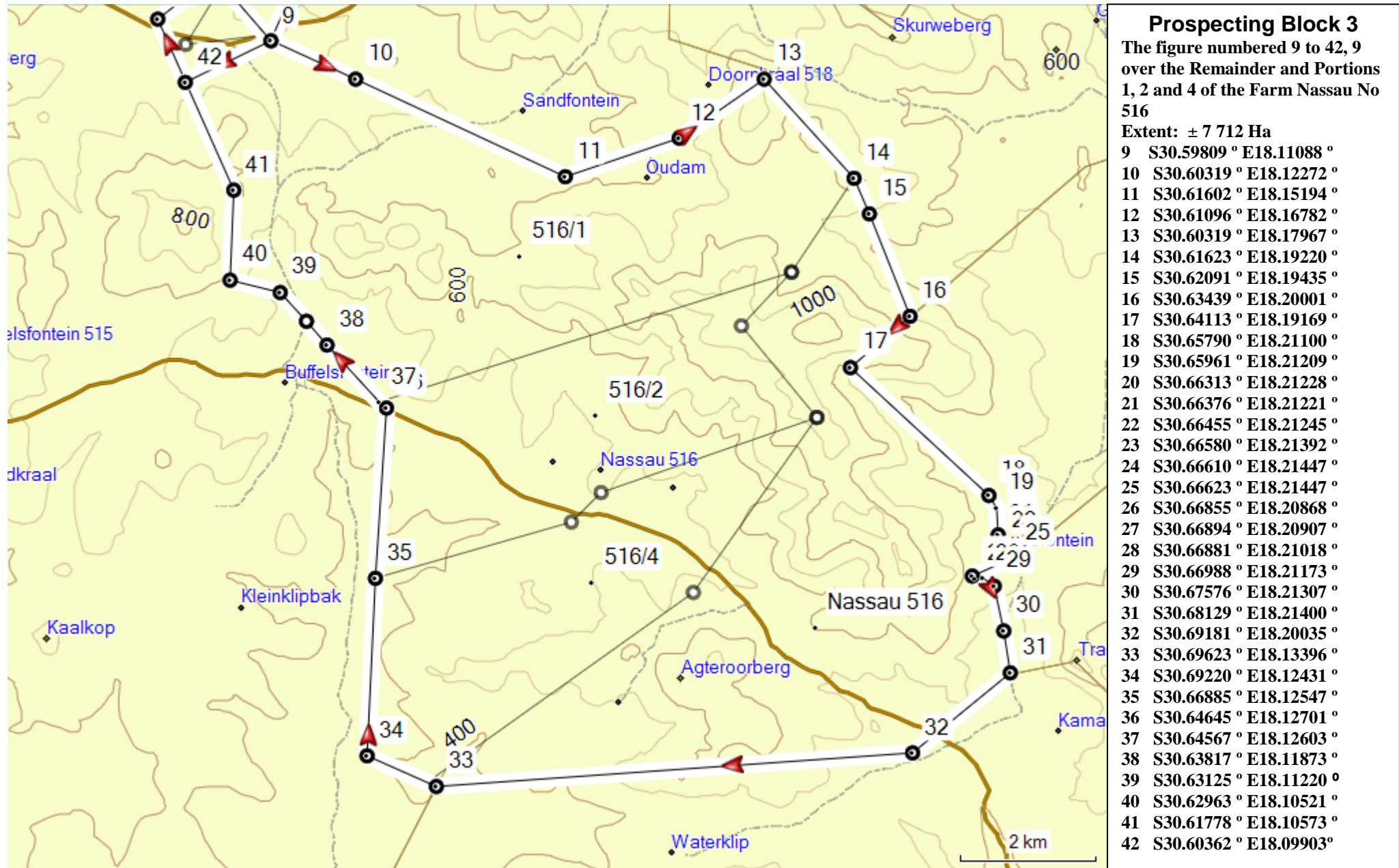
**Prospecting Block 2**

The figure numbered 8, 9, 42 to 45, 8 over Portion 1 of the Farm Roodebergs Kloof No 425 and Portions 8, 10 and 13 of the Farm Buffelsfontein No 515

Extent: ± 776 Ha

8	S30.56925° E18.12444°
9	S30.59809° E18.11088°
42	S30.60362° E18.09903
43	S30.59529° E18.09513°
44	S30.58950° E18.10306°
45	S30.56735° E18.08302°

**Diagram 4: Layout plan – Prospecting Block 3** (contemplated in regulation 2(2) of the MPRD Act, 2002 (Act No. 30 of 2002))



## **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 operation.

#### 2.1.1 Plan of the main activities with dimensions

The plan submitted under paragraph 1.4 show the main land uses on the proposed prospecting area and as can be seen more than 90% of the area is zoned as agricultural or unspecified land use.

With regard to the proposed prospecting activities no additional infrastructure including roads will be constructed that needs to be indicated on the plan.

The main invasive prospecting activity will be drilling. It is impossible to show the spatial location and aerial extent with dimensions of any drill traverses at this stage before the initial non-invasive work has identified potential targets for drilling.

The plans as contemplated in regulation 2.2, of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) will be updated on an annual basis with regard to the actual progress of the establishment of surface infrastructure, prospecting operations and rehabilitation together with an Performance assessment report as contemplated in regulation 55(1) (c) on the implementation of the Environmental Management Plan.

#### 2.1.2 Description of construction, operational, and decommissioning phases

This application employs a phased approach, where the work program is divided into several sequential sections. At the end of each section there will be a brief period of compiling and evaluating results. These results will not only determine whether the project proceeds, but also the manner in which it will go forward. Essentially, the Company will only action the next stage once satisfied with the results obtained. In addition, smaller, non-core parts of the work program will be undertaken if warranted. Essentially the program can be summarized as:

<u>Phase</u>	<u>Activity</u>	<u>Duration</u>
Phase 1	Investigations & surface surveys	2 years
Phase 2	Drilling* and assay	2 years
Phase 3	Compilation & reporting	1 year

\*Drilling denotes RC and diamond / core drilling.

It is not possible to give details of the drilling program before the surveys and surface work is completed. However, it is expected that since there are a number of targets on the property that over 100 drill holes will be necessary for evaluation. In the event that more information becomes available or that an ore body is located at an earlier stage, then an amended program will be put forward for the DMR's approval.

No bulk sampling work is to be carried out during this prospecting program.

Initial prospecting will be carried out by the company itself, utilizing its own in-house geologists and engineers to conduct and oversee the work. Drilling will be outsourced to a local drilling company. The methods detailed below would be used to investigate the prospecting area

### **Construction phase**

No infrastructure or roads will be constructed due to the small scale of operations that will only include field investigations and limited drilling as described in the operational phase below. No processing or bulk sampling will take place that need infrastructure to be constructed.

### **Operational phase**

NON-INVASIVE ACTIVITIES:

#### **Desk top surveys**

Imagery is one of the fields that have shown vast improvements in recent years. Today this is a powerful geological tool capable of providing a range of pertinent information. Declassification of space technology by the US and Russians, along with new techniques and colour enhancement has boosted resolution and applicability. Newer methods may also show large scale features such as lineaments and fault/fracture patterns not discernable at ground level. Different image methods and suppliers will be evaluated and an appropriate package secured. A follow-up ground geophysical survey may be conducted, if warranted.

#### **Geological Mapping**

The geological surface mapping exercise will be conducted over the property and will include the mapping of the soil/sand overburden and the where accessible, particular attention will be paid to basement lithologies. All geological features will be recorded and all results compiled for correlation purposes.

#### **Geochemical Survey**

From the information of the desktop surveys and mapping, a reconnaissance soil sampling programme would be set up in a series of traverses across the prospecting area to determine anomalous concentrations of base metals in surface samples. A surface sample will be collected, sieved and the fine portion reduced and sent for assay. Reconnaissance stream sediment sampling will also be conducted at regular intervals along the dry river beds. In both cases more detailed and systematic sampling (probably on grid basis) would be carried out as a follow-up measure.

Although there is a slight soil disturbance, sampling is viewed as primarily non-invasive as it is generally restored almost immediately and only a small portion removed for assay.

#### **Geophysical Surveys**

As a secondary phase to the initial work, ground surveys would give better definition to possible mineralized areas. A preliminary hand-held magnetometer survey followed by either electro-magnetics (EM) or gravity (the norites are more dense than surrounding country rocks) could yield the best results. It will only be possible to be more specific about methods to be employed after the initial work.

#### **Data Compilation**

All geological, geochemical, geophysical and topographic information will be captured in electronic format. This will allow for the superimposition of the various layers of information (geology, geophysics and topography) and will form the basis for the interpretation of the information generated, resulting in the further definition of the potential 3D spatial distribution of any mineralization. It will further enable the creation of a GIS database

Upon completion of the data capture, a model will be generated defining the spatial distribution of the bedrock, the ore and the surrounding country rock.

## INVASIVE ACTIVITIES:

### **Channel Sampling**

Although this has been included under invasive prospecting, its impact on the environment would be negligible as the sampling is of extremely limited extent. Under qualified supervision, a channel of chip samples across various sections of identified anomalies would be taken for analysis. A small channel would be chipped by hand across selected sections. The orientation of these samples is usually normal to the strike of the mineralised zone. Exposure is likely to be quite limited however; samples should give a good indication of the ore mineralogy for subsequent petrographic studies. This form of sampling would have a totally negligible impact on an environmental aspect and total material to be removed would be less than 25Kg per sampling area.

### **Drilling**

Although two different types of drilling are to be applied to the concession, they both have some common operations. In all instances drilling would be:

- Under close supervision of a geologist
- Conducted along best practice guidelines
- Minimize environmental disturbance

In this area, most of the target horizons are relatively close to surface and hence drillholes should be quite short; in the range of 100 – 200m

#### RC Drilling

Reverse circulation or RC drilling is possibly the most definitive and powerful exploration tool in this hard rock environment. Under the direct supervision of a resident geologist, fairly wide spaced holes (probably 200m apart) would be sited over interesting structures and hot spots located from earlier surveys. Cuttings would be collected by cyclone and the material split between the chip tray and sampling. Chippings would be photographed, logged and a sample taken for analysis on a 0.5m interval from all target horizons

#### Diamond Drilling

It is hoped to be able to employ more sophisticated drill rigs which can switch between RC and diamond drilling. These have advantages in speed and costs. Core drilling, being considerably slower and more expensive, will be used as a target follow-up method where more precise information is needed on geological features, underground conditions and grades. It is aimed to use core drilling to infill between RC drill fence lines and accurately define mineralized zones or horizons. Drill spacing would be initially closed down to 50m and in some areas further to 25m. The target lithology is usually quite shallow and maximum depths drilled are expected to be between 100 – 125m. Mineralized core or core from the target zone (even if it does not show visible ore) after logging and photographing, would be halved used a core splitter. One half being put aside for sample testing which includes both assay and metallurgical work (if selected on a proportional basis). The remaining half forms part of the permanent record which is loaded in a core tray in the core shed.

Geologically select holes are picked for down-hole surveying using portable geophysics for magnetic and radiometric expression. This is the last geophysics to be carried out.

Collars would be marked with a numbered and dated steel peg and exact positions recorded on a GPS. All sites are rehabilitated and photographed.

Since it generates a larger and more precise sample it is also key for preparing any metallurgical samples.



### **Metallurgical Sampling**

This would be scheduled towards the end of the programme as it requires the completion of the drilling to generate most of the sample. This sample must be carefully prepared to cover all different ore types and a proportional composite for test work and grade determination. Such sample would be made up from surface and underground chip samples along with cutting and split cores from the drilling. In this regard IT IS NOT A BULK SAMPLE, requiring excavation of a significant volume of rock from any one place and requiring explosives.

The samples would undergo pilot scale investigation to determine optimal crushing, screening, and floatation characteristics. This work would be carried out off site, probably at a metallurgical laboratory in or around Johannesburg.

Grade information will be generated to verify the earlier sampling results by treating samples through the smaller scale recovery circuit utilizing the same method as would be considered for commercial operations. The same information would be used to size the process plant and to select equipment. Layout and location would be designed in such a manner as to minimize any visual or environmental impact.

### **PRE-/FEASIBILITY STUDIES**

Any programme such as this culminates with an overall completion study and in this case the objective would be to provide a pre-feasibility study at a suitably detailed level for planning and to enable the commencement of financing and funding.

During the final year all data needs to be compiled, interpreted, summarized and evaluated in a final report. Several additional studies will need to be completed in order for an informed decision to be made on whether or not to proceed with development. Aside from all the information already discussed, expert input is frequently required in geohydrology, rock mechanics, statistical grade distribution, pyro- or hydro-metallurgy and other specialized fields. In addition, extra specialized studies have been allowed for to cover provision of services (power, water, labour), logistics, consumables, and all other items necessary in a pre-feasibility study. Consequently while others costs decline in the final year, the cost of consultants is increased as much of the is traditionally outsourced – both as a independent verification and because few companies can keep so many specialist talents on their books.

A direct follow on from the report is the ability to start looking at various funding alternatives, be they private, public or listed. In mine development it is normal because of the amounts of money involved that the latter two sources of finance predominate. These avenues often require separate reporting and the creation of relationships with key financial advisors, stockbrokers and fund managers. It is envisaged that the company would most likely follow a stock exchange listing route but the detail of this can only be determined later.

### **Decommissioning phase**

Regulations 56 to 62 outline the entire process of mine closure, both as a guide to the process to be followed for mine closure, and also to address the legal responsibility with regard to the proper closure of operations. In terms of Section 37 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), the holder of a right is liable for any and all environmental damage or degradation emanating from his operation, until a closure certificate is issued in terms of Section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002).

"An application for a closure certificate must be accompanied by an environmental risk report which must include-

- (a) the undertaking of a screening level environmental risk assessment where-
- (b) the undertaking of a second level risk assessment on issues classified as
- (c) assessing whether issues classified as posing potential significant risks are acceptable without further mitigation;
- (d) issues classified as uncertain risks be re-evaluated and re-classified as either posing potential significant risks or insignificant risks;
- (e) documenting the status of insignificant risks and agree with interested and affected persons;
- (f) identifying alternative risk prevention or management strategies for potential significant risks which have been identified, quantified and qualified in the second level risk assessment;
- (g) agreeing on management measures to be implemented for the potential significant risks which must include-

<b>Phase</b>	<b>Activity</b> <small>(what are the activities that are planned to achieve optimal prospecting)</small>	<b>Skill(s) required</b> <small>(refers to the competent personnel that will be employed to achieve the required results)</small>	<b>Timeframe</b> <small>(in months) for the activity)</small>	<b>Outcome</b> <small>(What is the expected deliverable, e.g. Geological report, analytical results, feasibility study, etc.)</small>	<b>Timeframe for outcome</b> <small>(deadline for the expected outcome to be delivered)</small>	<b>What technical expert will sign off on the outcome?</b> <small>(e.g. geologist, mining engineer, surveyor, economist, etc)</small>
Phase 1 2years	<b><u>NON - INVASIVE</u></b> Site establishment	Foreman, site manager	3 months	Office, communications & staffing	Months 6	Local manager
	Literature survey	geologist	3 months	All past information & results. Initial report	Months 6	Geologist
	Aerial Survey	Consulting Geophysicist	3 months	Aeromagnetic survey	Months 12	Geophysicist
	Geological mapping	Samplers, geologist	3 months	Geological map of licence	Months 12	Geologist
	Geochemical survey	Samplers, geologist	3 months	Geochemical map and targets	Months 18	Geologist
	Geophysical survey	Geophysicist	3 months	Follow up survey	Months 18	Geophysicist
	Interpretation	Geologist	3 months	Sections, plans and report	Months 24	Geologist
	Drilling plans	Driller, geologist	3 months	Exact locations, orientations, contract	Months 24	Contracted driller * site manager
Phase 2 2 years	<b>INVASIVE PROSPECTING</b> RC drilling	Foreman, driller, labour, geologist	6 months	Drill samples, assay	Months 36	Geologist & compliance officer
	Diamond drilling	Labour, sampler driller, geologist	6 months	Foreman, labour, driller, geologist	Months 36	Contractor and site manager
	Assay and data capture	Chemical analyst and geologist	2 months	Lab technician, geologist	Months 48	Assay laboratory manager
	Down hole surveys	Geophysicist	2 months	Geophysics and radiometric	Months 48	Consulting Geophysicist
	Specialist core studies	Several specialists	2 months	Mineralogy, rock mechanics	Months 48	Mineralogist, mining engineer
	Metallurgical testwork	Sampler, consulting	3 months	Information on crushing, milling,	Months 48	Metallurgist

		metallurgist		recovery and equipment		
	Interpretation of results	Data technician, geologist, engineers	3 months	Technical reports	Months 48	Geologist, mining engineer
Phase 3 1 year	<b>NON INVASIVE</b> Completion of all site work	Labour, Environmentalist	3 months	Restoration of site	Months 60	Geologist, environmentalist
	Additional studies	Specialized inputs	3 months	Modeling, ore resources	Months 60	IT & Resource specialists
	Valuation	Mineral economist	3 months	Financial analysis, funding options	Months 60	Mineral economist
	Completion Report	All disciplines	3 months	Pre-feasibility report and resource statement	Months 60	Geologist, mining engineer, mineral economist. Senior manager

### 2.1.3 Listed activities (in terms of the NEMA EIA regulations)

With regard to listed activities in terms of the Environmental Impact Assessment Regulations Listing Notice 2 of 2010, the competent authority in respect of the activities listed is the environmental authority in the province in which the activity is to be undertaken, unless - (b) the activity is to be conducted in or on a mining area or is to transform the area where the activity is to be conducted into a mining area in which case the competent authority is the Minister of Minerals and Energy. In this case all activities are to take place within a prospecting area therefore all activities will be covered by this EMPR.

The exception mentioned in (b) above does not apply to the following activities contained in the notice 1;2;5;8; 9; 10; 12; 13; 14; 17; 24 and 25.

The activities where environmental authorizations is required in addition to the approved EMPR are addressed below with their applicability to this specific operation

Activity Number	Activity description	
1.	The construction of facilities or infrastructure for the generation of electricity where the electricity output is 20 megawatts or more.	Not applicable
2.	The construction of facilities or Infrastructure for nuclear reaction including energy generation, the production, enrichment, processing, reprocessing, storage or disposal of nuclear fuels, radioactive products and nuclear and radioactive waste.	Not applicable
5.	The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included In the list of waste management activities published In terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.	Not applicable
8.	The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.	Not applicable
9.	The construction of facilities or infrastructure for marine telecommunication.	Not applicable
10.	The construction of facilities or infrastructure for the transfer of 50 000 cubic metres or more water per day from and to or between any combination of the following: (i) water catchments (ii) water treatment works: or (iii) impoundments, excluding treatment works where water is to be treated for drinking purposes	Not applicable
12	The construction of facilities, infrastructure or structures for aquaculture of – (i) finfish, crustaceans, reptiles or amphibians where the facility, infrastructure or structures will have a production output of 200 000 or more kg per annum (live round weight), (ii) molluscs where the facility, infrastructure or structures will have a production output of 150000 or more kg per annum (live round weight) (iii) aquatic plants where the facility, infrastructure or structures will have a production output of 200 000 or more kg per annum (live round weight), excluding where the construction of facilities, infrastructure or structures is for purposes of offshore cage culture In which case activity 13 in this Notice will apply	Not applicable

13	The construction of facilities, infrastructure or structures for aquaculture of offshore cage culture of finfish, crustaceans, reptiles, amphibians, molluscs and aquatic plants where the facility, infrastructure or structures will have a production output of 100 000 or more kg per annum (live round weight).	Not applicable
14	The construction of an island, anchored platform or any other permanent structure on or along the sea bed.	Not applicable
17	The extraction or removal of peat or peat soils, including the disturbance of vegetation or soils in anticipation of the extraction or removal of peat or peat soils.	Not applicable
24	Construction or earth moving activities In the sea, an estuary, or within the littoral active zone or a distance of 100 metres Inland of the high-water mark of the sea or an estuary, whichever distance is the greater, in respect of: (i) facilities associated with the arrival and departure of vessels and the handling of cargo (ii) piers; (iii) inter- and sub-tidal structures for entrapment of sand; (iv) breakwater structures; (v) coastal marinas; (vi) coastal harbours or ports; (vii) structures for reclaiming parts of the sea; (viii) tunnels; or (ix) underwater channels; but excluding — (a) activities listed in activity 16 in Notice 544 of 2010, (b) construction or earth moving activities if such construction or earth moving activities will occur behind a development setback line; (c) where such construction or earth moving activities will occur in existing ports or harbours where there will be no increase of the development footprint or throughput capacity of the port or harbour; or (d) where such construction or earth moving activities takes place for maintenance purposes	Not applicable
25	The expansion of facilities for nuclear reaction including energy generation, the production, enrichment, processing, reprocessing, storage or disposal of nuclear fuels, radioactive products and nuclear and radioactive waste.	Not applicable

## 2.2 Identification of potential impacts

### 2.2.1 Potential impacts per activity and listed activities

Prospecting will mainly consist of non-invasive field work with limited drilling and soil-sampling less than 25 Kg per sampling site the overall impact on the biophysical environment will be insignificant. The implementation of the mitigating and management measures in paragraph 3.2 will address all impacts and after implementation of the mitigating measures most impacts can be classified as insignificant.

The following is a summary of the expected impacts of the operation (in terms of spatial disturbance):

#### Access Roads and Tracks-

Use of existing roads is emphasized. Formal roads (i.e. with imported material) will only be developed over short distances if at all where traffic exceeds a very nominal amount, as experience by farmers has shown that tracks quickly become degraded to such an extent to be impassable with the result that drivers develop new tracks next to the affected tracks thereby exacerbating the damage.

Access requirements will generally be catered for by narrow tracks (with no topsoil removal).

Drilling

Drilling will have an insignificant impact on the geology as borehole collars will remain. No backfilling will take place therefore mixing of the geological sequence of sediment will not occur.

Due to the shallow nature of operations the impact on the groundwater is considered insignificant. The absence of a waste handling program can however have a significant impact through oil and fuel spills and soil contamination. No process water will be used during prospecting operations or will be purchased from the local authority if needed.

Metallurgical Sampling

The small volume of soil and stream sampling less than 25Kg per site without the possibility of backfilling will have an insignificant negative impact on the visual aspect of the topography.

This impact assessment only deals with significant impacts and as prospecting will mainly consist of non-invasive field work with limited drilling and soil-sampling less than 25 Kg per sampling site the overall impact on the biophysical environment will be insignificant. The implementation of the mitigating and management measures prescribed in the EMP will address all impacts and after implementation of the mitigating measures most impacts can be classified as insignificant.

## 2.2.2 Potential cumulative impacts

The only identified land use is small stock grazing and due to the temporarily nature of change in land use and small scale of the operation prospecting will not have any impact and the land will revert back to its former use grazing with no impact on production.

## 2.2.3 Potential impact on heritage resources

Prospecting will mainly consist of non-invasive work with limited drilling and soil sampling and given the extent of the mining activities on site to date no phase 1 archaeological study is deemed necessary.

Should any fossils be discovered or unearthed in the process of prospecting, the prospecting right holder will contact a South African Museum or University which employs palaeontologists so that the necessary palaeontological salvage operations can take place. No other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewsapes are present on the mining area.

## 2.2.4 Potential impacts on communities, individuals or competing land uses in close proximity

The only identified land use is small stock grazing and due to the temporarily nature of change in land use and small scale of the operation prospecting will not have any impact and the land will revert back to its former use grazing with no impact on production. The area is farmland that is not close to any settlement therefore no land development projects are in progress.

### 2.2.5 Confirmation that the list of potential impacts has been compiled with the participation of the landowner and interested and affected parties

No proposals were received during the consultation process due to the non-invasive nature of the prospecting operation and as the proposed operation is situated within an area that was disturbed by previous mining operations.

### 2.2.6 Confirmation of specialist report appended.

No specialist reports are deemed necessary as no sensitive areas are included in the proposed area and due to the non-invasive nature of the proposed project.

## 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

Early phases of prospecting will have minimal impact on the environment and hence little rehabilitation should be necessary. Fortunately, this area is duplicated by large tracts of land on all sides which offer the same habitat to fauna and flora. It is also partly covered by sand and the prospecting is of such a nature that for the initial work there will be minimal change to the original land surface. Consequently there are no foreseen major environmental issues and no expectation of longer term impacts in phase 1.

Phase 2 would be more invasive but still only to a relative small extent and the impact would be minimized through proper supervision. Drill rigs would utilize existing roads and strong control exercised over oil usage and sump pools. Impervious sheeting would be laid underneath the rig and sump areas to catch any spills and the contaminated ground removed to an approved dump site. Original soils would finally be spread over each drill location. Overall the disturbance to the land surface would be minimal and the drilling itself only removes a very small amount of ground for sampling and assay.

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

The impact on each of the aspects is measured according to the following table of significance:

#### **Negative**

##### Significant

Recommended level always exceeded with associated widespread community action

Disturbance to areas that are pristine, have conservation value, are important resource to humans and will be lost forever

Complete loss of land capability

Destruction of rare or endangered specimens

May affect the viability of the project

##### Moderate

Moderate measurable deterioration and discomfort

Recommended level occasionally violated - still widespread complaints



	Partial loss of land capability Complete change in species variety or prevalence May be managed Is Insignificant if managed according to EMP provisions
Minor/Insignificant	Minor deterioration Change not measurable Recommended level will rarely if ever be violated Sporadic community complaints Minor deterioration in land capability Minor changes in species variety or prevalence
<b>Positive</b>	
Minor	Improvements in local socio-economics
Significant	Major improvements in local socio-economics with some regional benefits

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

#### **Construction phase**

No construction activities therefore no potential impact.

No infrastructure or roads will be constructed due to the small scale of operations that will only include field investigations and limited drilling as described in the operational phase below. No processing or bulk sampling will take place that need infrastructure to be constructed.

#### **Operational phase**

Initial prospecting will consist of non-invasive activities that will have no impact on the environment. Initial prospecting will include Aerial surveys, Geological Mapping, Geochemical Survey, Geophysical Surveys and Data Compilation

The latter part of the operation will include limited invasive activities in the form of drilling and metallurgical sampling.

##### Geology

Significance/Magnitude	Duration	Probability	Timing
Low	Permanent	Certain	Activity

Drilling will have an insignificant impact on the geology if borehole collars and sumps will remain. No backfilling will take place therefore mixing of the geological sequence of sediment will not occur.

##### Ground water

Significance/Magnitude	Duration	Probability	Timing
Medium	Point	Unlikely	Activity

Due to the shallow nature of operations the impact on the groundwater is considered insignificant. The absence of a waste handling program can however have a significant impact through oil and fuel spills and soil contamination. No process water will be used during prospecting operations or will be purchased from the local authority if needed.

##### Topography

Significance/Magnitude	Duration	Probability	Timing
Low	Long term	Certain	Activity

The small volume of soil and stream sampling less than 25Kg per site without the possibility of backfilling will have an insignificant negative impact on the visual aspect of the topography.

## Decommissioning phase

Successful implementation of the Environmental Management Program during the life of the mine will cover all the significant aspects affecting the environment.

### 3.1.3 Assessment of potential cumulative impacts.

The only identified land use is small stock grazing and due to the temporarily nature of change in land use and small scale of the operation prospecting will not have any impact and the land will revert back to its former use grazing with no impact on production.

## 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.

Possible risk factor	Qualitative impact level	If Insignificant, Why?
<i>Geology:</i>	None	No excavations will be done
<i>Topography (Safety):</i>	Potential significant impact	Borehole sumps remaining on site of about 25m <sup>2</sup> each will require mitigation
<i>Land Capability:</i>	Insignificant	In the overall scheme of the surrounding landscape, any remaining sumps of 25m <sup>2</sup> per sump is minor and the remaining impact in this regard is insignificant
<i>Soil:</i>	Insignificant	Soil erosion will pose no risk
<i>Vegetation:</i>	Insignificant	Due to the low rainfall the establishment of invader species and other exotic plants poses no risk.
<i>Fauna.</i>	Insignificant	Minimal risk given the low density of fauna and the fact that the habitat is well represented in the adjacent area for dispersal.
<i>Surface water.</i>	Insignificant	No surface water present on the site. The hydrological integrity of drainage channels will not be altered by attenuating or diverting any of the natural flow.
<i>Groundwater:</i>	Insignificant	Only shallow boreholes will be drilled and no groundwater will be used on site.
<i>Air Quality:</i>	Insignificant	Isolation of site and small scale of operation precludes any impact in this regard No FRD will be created on site and no loading and hauling will take place.
<i>Noise</i>	None	No activities except for the drilling operation that will be within the norm.
<i>Archaeology:</i>	None	No excavations will take place
<i>Visual Impact:</i>	Potential significant impact	Borehole sumps remaining on site of about 25m <sup>2</sup> each will require mitigation

3.2.2 Concomitant list of appropriate technical or management options (Chosen to modify, remedy, control or stop any action, activity, or process which will cause significant impacts on the environment, socio-economic conditions and historical and cultural aspects as identified. Attach detail of each technical or management option as appendices)

The goal of rehabilitation with respect to the area is to leave the area level and even, and in a natural state containing no foreign debris or other materials.

All scrap and other foreign materials will be removed and disposed of as in the case of other refuse whether these accrue directly from the prospecting operation or are brought on to the site from outside.

Assuming that 100 boreholes will be present at any given time, 100 sumps will be rehabilitated. At 25m<sup>2</sup> per sump the total surface disturbance will be 2 500m<sup>2</sup> (0.25 hectares). As stipulated in drilling contracts the drilling contractor is obliged to rehabilitate each site immediately after the completion of each borehole.

Percussion drilling does not require sumps, as it is a dry operation. The samples are collected completely in large bags attached to the cyclone. From past experience in this region rain and wind eliminates all signs of prospecting activities within one season, except the drill collars, which are protected by cement markers until the end of the prospecting period.

Drilling equipment will only be used during the second phase depending on the outcome and results of phase 2. This machinery will not be extensively repaired in any place other than in the workshop available in any one of the two major towns Nababeep and Springbok. No infrastructure will be constructed during prospecting.

Bore hole sites are GPS located and pegged with a steel dropper. The site is inspected and photographed prior to any disturbance. A drill pad is then cleared, keeping disturbance to the native vegetation to an absolute minimum. Any topsoil removed is stored separately for later reuse. Plastic lining to prevent oil spillage is used under the rig. The area is cordoned off. After the drilling operation is complete, each borehole collar is surveyed and the site is rehabilitated and photographed. The retained topsoil is used to fill any sumps. Any spoils or drilling material is transported off site and disposed of in an approved area.

Fuel for the drilling equipment will be stored in mobile tanker trailer. Accidental spills will be cleaned up immediately by removing the spillage together with the polluted soil and by disposing of them at a recognised facility. Equipment used in the prospecting process will be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.

### **Ancillary prospecting requirements**

The following are other aspects of the operation that could result in environmental impact if not properly controlled or specified.

#### Roads & Tracks

a) Formal roads: Farm tracks quickly deteriorate should they experience more than the minimum traffic. The result is that drivers leave the deteriorated track and drive in the veld next to the track, causing extensive damage to the veld. In order to prevent such damage, these "well-traveled" routes will have to be armoured with imported material. No new roads are likely to be affected by such armouring.

b) Tracks are less formal than roads and will result where very little traffic will be required, for instance, along the small diameter drill line traverses. Existing farm

tracks will be used where possible. Any new tracks will not have topsoil removed but will be rehabilitated through a single pass of a 2 toothed scarifier (avoiding disturbance of the "middelmanneljje") only after consultation with the farmer.

#### Central Camp Site:

Operations will be run from Garries.

#### Domestic Waste Management Facilities:

Each prospecting site must be provided with a bin. Refuse will be removed daily from that bin for transport to the municipal dumping site.

#### Oil/Fuel Leak Management:

Fuel receipt, storage and dispensing:

In the management of fuel supply, receipt, storage and use, the following procedures will be followed, cautions taken and facilities built to properly manage this operational sector:

- The fuel delivery bowser driver will be cautioned to adhere to safe driving speeds and drive cautiously.
- During dispensing of fuel to other facilities (plant and other tanks) or field vehicles via tanker, the dispensing vehicle is to be fitted with suitable pumps and funnel extensions to reduce the risk of spillage in the transfer of fuels.

#### On site repairs

No workshops will be required at the prospect and all scheduled servicing will take place at workshop facilities in one of the nearby towns.

#### Emergency repairs on site:

In the event of a breakdown repair being required in the field, the staff should be trained in use of drip trays and suitable funnels (not to drain oil into the sand) for filling and draining of lubricants and the staff shall be provided with such equipment to prevent oil contamination.

In addition:

- Used/replaced filters, hoses, belts, cloths, etc. are to be placed in a bin for return to the used oil and lubricant storage area which is to be constructed as shown above. Used filters are not to be buried at the site of repair (nor discarded in the excavation to be backfilled).
- In the event of soil contamination, the soils are to be treated with a suitable decontaminant such as the OT8 product range or Spillsorb or similar product.

All staff involved in mobile plant operation and maintenance is to be made aware of these oil and lubricant procedures. Staff will require instruction in the:

- Deleterious effects of oil / fuel on the environment
- Neutralization of oil leaks on the concrete apron,
- The operation of the oil trap (including the storage of trapped oil); and
- Use of OT8/Spillsorb products.

#### General Provisions

- All operators are to check their equipment for leaks and report such leaks on a daily basis.
- No used oils are to be used as dust suppressants on manoeuvring areas.

All staff to be instructed to report oil spills immediately and be trained in fire fighting and the use of biodegradable solvents such as OT8 or Spillsorb or similar products in the clean-up operation

#### Potable Water

Potable water will be bottled and brought to site by the employees as required from the logistical facility.

### 3.2.3 Review the significance of the identified impacts

The table below uses the potential significant impacts as identified in paragraph 3.2.1 and applies them to the proposed mitigation measures in paragraph 3.2.2.

Topography and Visual Impact:	<p>Insignificant risk (after decommissioning/rehabilitation is completed):</p> <p>Decommissioning rehabilitation entails the effective shaping of the final faces of the sump with erosion control facilities above all edges. The excavation will form an even depression that is stable and that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation.</p>
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## 4 REGULATION 52 (2) (d): Financial provision.

### 4.1 Plans for quantum calculation purposes.

The main invasive prospecting activity will be drilling that will take place according to traverses. It is impossible to show the spatial location and aerial extent with dimensions of any drill traverses at this stage before the initial non-invasive work has identified potential targets for drilling (also refer 2.1.1) but a tentative layout is indicated on the work plan below.

### 4.2 Alignment of rehabilitation with the closure objectives

The goal of rehabilitation with respect to the area where drilling will take place is to leave the area level and even, and in a natural state containing no foreign debris or other materials.

All scrap and other foreign materials will be removed from the area and disposed of as in the case of other refuse, whether these accrue directly from the prospecting operation or are brought on to the site.

Removal of these materials shall be done on a continuous basis and not only at the start of final rehabilitation and closure.

The small amount of overburden from the drill pads will be back filled into the holes and covered with topsoil. The area will be profiled to blend in with the topography of the surrounding environment.

The mitigating measures described in paragraph 3 are compatible with these closure objectives.

### 4.3 Quantum calculations.

The area will be rehabilitated with the original land use namely small stock farming in mind and the productivity of the area after closure will be the same as before prospecting operations started. Rehabilitation cost is estimated with the proposed end-state in mind and although the applicant has his own equipment and rehabilitation will take place concurrent with prospecting the tariffs for equipment was based on local hiring tariffs in Garies the closest town.

### Rehabilitation of access roads

No access roads or infrastructure will be constructed only existing farm roads will be used.

**Rehabilitation of the office/camp site**

No permanent structure will be build and all operations will be run from Garies or Springbok.

**Rehabilitation of vehicle maintenance yard and secured storage areas**

No vehicle maintenance yard or secure storage areas will be constructed as infrastructure is available in Garies or Springbok.

**Rehabilitation of surface disturbance drill pads**

The goal of rehabilitation with respect to the area where drilling has taken place is to leave the area level and even containing no foreign debris or other materials.

All scrap and other foreign materials will be removed from the site and disposed of as in the case of other refuse whether these accrue directly from the prospecting operation or are brought on to the site from outside.

All drill holes will be back filled. Once the overburden have been profiled the topsoil previously stored, will be returned and the total area will be profiled with acceptable contours and erosion control measures. This estimation is based on 100 drill sumps of 25m<sup>2</sup> each. The exact number of traverses and holes will only be known after completion of initial prospecting and the layout plans and rehab estimate will be updated before commencing with invasive prospecting.

Extent:	2 500m <sup>2</sup>
Duration of rehabilitation: 2 holes per day	50 days
Equipment require:	
Manual labor @ R500.00/day for backfilling and profiling	R 25 000.00
Cost of rehabilitation:	R 25 000.00

**Final rehabilitation**

All equipment and other items used during the prospecting period must be removed from the site. Waste material of any description, including receptacles, scrap, rubble and tyres, must be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be buried or burned on the site.

Extent:	1Ha
Duration of rehabilitation:	5 days
Equipment required:	
Manual labor @ R500.00/day for clean-up	R 2 500.00
Cost of rehabilitation:	R 2 500.00

The applicant is willing to escalate the total estimated amount of R 27 500.00 that is needed for rehabilitation to R30000.00 that is more than is needed for the rehabilitation of damage caused by the operation, both at sudden closure during the normal operation of the project or at final, planned closure.

**4.4 Undertaking to provide financial provision**

Financial provision required under Regulation 54 for the amount of R 30 000.00 will be furnish to DME. The quantum will be updated again within a year or at a shorter interval if there is any deviation from the prospecting work program.

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

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

None of the impacts identified required specific monitoring programs but inspections and monitoring shall be carried out on both the implementation of the program and the impact on the natural and cultural environment. Visual inspections on erosion and physical pollution shall be carried out on a regular basis together with fixed point photography.

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

Every aspect of the operation must be checked against the prescriptions given in this document and if find that certain aspects are not addressed or impacts on the environment are not mitigated properly, the identified inadequacies will be rectified immediately.

Regular monitoring of all the environmental management measures and components shall be carried out to ensure that the provisions of this program are adhered to.

Layout plans will be updated on a regular basis and updated copies will be submitted on an annual basis to the Regional Manager. The plans will also be updated before commencing with drilling and the rehabilitation quantum will also be updated.

Reports confirming compliance with various points identified in this program will be submitted to the Regional Manager on an annual basis together with an update of the rehabilitation cost. Any emergency or unforeseen impact will be reported as soon as possible. An assessment of environmental impacts that were not properly addressed or were unknown when the program was compiled shall be carried out and added as a corrective action.

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

The project manager will be responsible for monitoring and Reports confirming compliance with various points identified in the environmental management program.

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

The project manager must on a bi-monthly basis, check every aspect of the operation against the prescriptions given in this document and, if find that certain aspects are not addressed or impacts on the environment are not mitigated properly, the project manager must rectify the identified inadequacies immediately.

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

### **6.1 Rehabilitation plan**

The main invasive prospecting activity will be drilling as indicated on the plan in 4.1 above. It is impossible to show the spatial location and aerial extent with dimensions of any drill traverses at this stage before the initial non-invasive work has identified potential targets for drilling (also refer 2.1.1).

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

The environment affected by the prospecting operations shall be rehabilitated, as far as is practicable, to its natural state. Land use will be the same as before prospecting with the same production with regard to grazing by livestock. The affected environment shall be maintained in a stable condition that will not be

detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof.

The goal of rehabilitation with respect to the area where drilling will take place is to leave the area level and even, and in a natural state containing no foreign debris or other materials.

All scrap and other foreign materials will be removed from the area and disposed of as in the case of other refuse, whether these accrue directly from the prospecting operation or are brought on to the site.

Removal of these materials shall be done on a continuous basis and not only at the start of final rehabilitation and closure.

The small amount of overburden from the drill pads will be back filled into the holes and covered with topsoil. The area will be profiled to blend in with the topography of the surrounding environment.

The mitigating measures described in paragraph 3 are compatible with these closure objectives.

### 6.3 Confirmation of consultation

A copy of the consultation report that includes environmental objectives in relation to closure was made available to the landowner and all other interested parties for comment. All comments received were addressed in this EMPR.

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

### 7.1 Identification of interested and affected parties.

#### 7.1.1 Name the community or communities identified, or explain why no such community was identified.

No community identified as the property is privately owned farm land without any lands claim registered on the property.

#### 7.1.2 Specifically state whether or not the Community is also the landowner.

No community identified as the property is privately owned farm land without any lands claim registered on the property.

#### 7.1.3 State whether or not the Department of Land Affairs been identified as an interested and affected party.

No, the property is privately owned farm land.

#### 7.1.4 State specifically whether or not a land claim is involved.

No land claim is registered against the property.

#### 7.1.5 Name the Traditional Authority identified

No Traditional Authority only local municipality

#### 7.1.6 List the landowners identified by the applicant.

Refer to consultation template attached as appendix 1

#### 7.1.7 List the lawful occupiers of the land concerned.

Refer to consultation template attached as appendix 1



7.1.8 Explain whether or not other persons' socio-economic conditions will be directly affected by the proposed prospecting or operation

The only other land use in the area is small stock grazing and due to the small extends of the operation there will be no impact on productivity. Prospecting will mainly consist of non-invasive activities with limited drilling, and the only impact on the socio-economic conditions will be positive through limited job creation.

7.1.9 Submit evidence that the landowner or lawful occupier of the land in question, and any other interested and affected parties were notified.

The landowners are deemed the only affected party and consultation has taken place by means of registered letters and/or personal communication. Letters to this regard is attached as appendixes.

Consultation has taken place by means of registered letters and/or personal communication with the local authority as landowner and representing the broader community of the region. A letter to this regard is attached as an appendix.

All other interested parties were invited to commend on the proposed project by means of an advertisement in the local newspaper, clipping attached as an appendix.

All comments were supposed to be directed to the regional director DMR with copies to the applicant.

7.2 The details of the engagement process.

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

A copy of the PWP and the consultation report (consultation template) was supplied and or explained to them.

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

No views or comment received

7.2.3 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

No views or comment received

7.2.4 Other concerns raised by the aforesaid parties

No views or comment received

7.2.5 Confirmation that minutes and records of the consultations are appended.

The landowners are deemed the only affected party and consultation has taken place by means of registered letters and/or personal communication. Letters to this regard is attached as Appendix 2

Consultation has taken place by means of registered letters and/or personal communication with the local authority as landowner and representing the broader community of the region. A letter to this regard is attached as Appendix 3.

All comments were supposed to be directed to the regional director DMR with copies to the applicant.

#### 7.2.6 Information regarding objections received.

No objections against the proposed prospecting operation that need to be dealt with by the REMDEC committee were received. All comments received were addressed as part of the EMP.

#### 7.3 The manner in which the issues raised were addressed.

No objections against the proposed prospecting operation received

##### 7.3.1 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

No views or comment received

##### 7.3.2 Other concerns raised by the aforesaid parties

All landowner requested that if water is found during the drilling phase the bore holes needs to be developed for supplying water.

Any new roads developed must be done in consultation with the landowners.

A responsible project manager needs to be appointed to control access to the properties and the landowners must be informed of anybody present on their property.

The speed limit on the properties is set as 15Km/h and even lower during lambing season.

All invasive prospecting must be planned so that it does not coincide with the lambing season.

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

#### 8.1 Employee communication process

General environmental awareness will be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This will ensures that environmental accidents are minimized and environmental compliance maximized.

Environmental awareness will be fostered in the following manner:

- a) Induction course for all workers on site, before commencing work on site.
- b) Refresher courses as and when required
- c) Daily toolbox talks at the start of each day with all workers coming on site, where workers can be alerted to particular environmental concerns associated with their tasks for that day or the area/habitat in which they are working.
- d) Taking part in national and international environmental campaigns like National Marine Week, National harbour day, National Wetlands day exacta.
- e) Displaying of information posters and other environmental awareness material in the general assembly points.

#### 8.2 Description of solutions to risks

Specific environmental awareness performance criteria will form part of the job descriptions of employees, to ensure diligence and full responsibility at all levels of the organisational work force.

General environmental awareness will be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. This will ensures that environmental accidents are minimized and environmental compliance maximized.

### 8.3 Environmental awareness training.

The goal of training is to enable a shared understanding and common vision of the environment, the impact of a mining operation on the environment (and why this is important) and the role of mining personnel in terms of environmental management and compliance.

The induction course will compose of the following steps:

- The first step will include background discussion of the environment concept: of what it comprises and how we interact with it.
- The second step will be a description of the components and phases of the specific mining operation.
- The third step will be a general account of how the mining operation and its associated activities can affect the environment, giving rise to what we call Environmental Impacts.
- The fourth and most important step will be a discussion of what staff can do in order to help prevent the negative environmental impacts from degrading our environment. This is known as Environmental Impact Management.

## **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.

Refer to section 4 that covers regulation 52 (2) (d) that handles with financial provision.

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

This amount was provided for in the cost estimate for the implementation of the PWP and proof of access to the necessary funds were supplied with the prospecting work program.

## **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.

<b>Full Names and Surname</b>	<b>Anthony Charles Coates</b>
<b>Identity Number</b>	<b>5103075045085</b>

**-END-**