



**mineral resources**

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Department:  
Mineral Resources  
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: Kasimira Trading 82 (Pty) Ltd

REFERENCE NUMBER: NC 30/5/1/1/2/10954 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.

### 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.

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

The farm Wolfberg where the proposed prospecting operation will take place have been mine extensively over the past 30 years. With regard to sites of archaeological interest most the area is already disturbed by extensive diamond mining. No heritage resources have been found on the site to date and the prospecting operation is a continuation of previous mining and prospecting operations that would have destroyed any sites of archaeological and cultural interest if they were present. No 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 prospecting area.

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

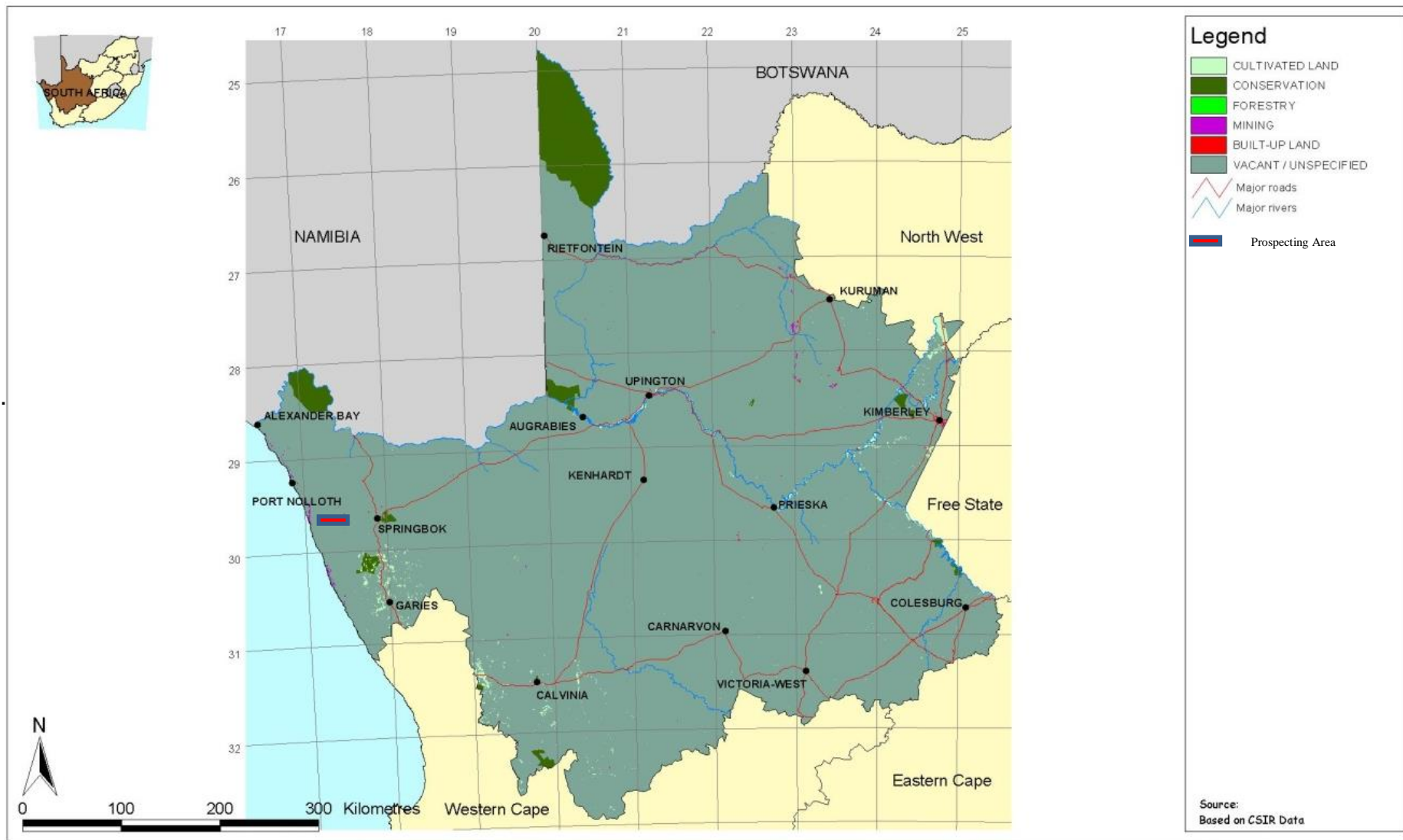
Prospecting will only be a temporary land use where after land use will revert back to the pre-mining land use grazing. Productivity of the land with regard to land use is very low and prospecting will have no impact on the productivity of the area

Most of the Northern Cape is defined as vacant or unspecified land use (Refer Map 1).

### Status of any infrastructure that may be affected

The only infrastructure on the area applied for belongs to the applicant as landowner and the only other infrastructure is the R355 public road through the property that will not be affected by the operation and the water supply line supplying Kleinzee with potable water.

**Map 1: Land use patterns of the Northern Cape**



## 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 of Springbok.

The regional topography surrounding the farm Wolfberg is generally flat lying coastal plain, with undulations relating to incised episodic drainage channels and the non-perennial Buffels River valleys. About 15 km east of the prospecting area, the topography takes on a hilly form of Namaqualand (refer Map 2). The portion of the farm north of the Buffels River dips very gently toward the southeast but the prospecting area are located on the higher ground ("plateau").

### **Soil**

Bedrock in the area consists of a series of schist's and granite gneisses of the Namaqualand Metamorphic Complex covered by sands, calcretes and dorbank. The diamonds in this alluvial deposit are found both in the basal lag of the palaeo channels and in potholes scoured into the softer schist bands. The palaeo channels in these deeper plunge pool environments are sealed by sandstone and elsewhere by cemented sands, dorbank and calcrete.

The gravels (0.1 to 1.0 m thick) are invariably white quartz pebbles and cobbles with a sprinkling of larger boulders. Smokey quartz is common. The gravels vary from loose cemented to very hard conglomerate (requiring some blasting to permit excavation).

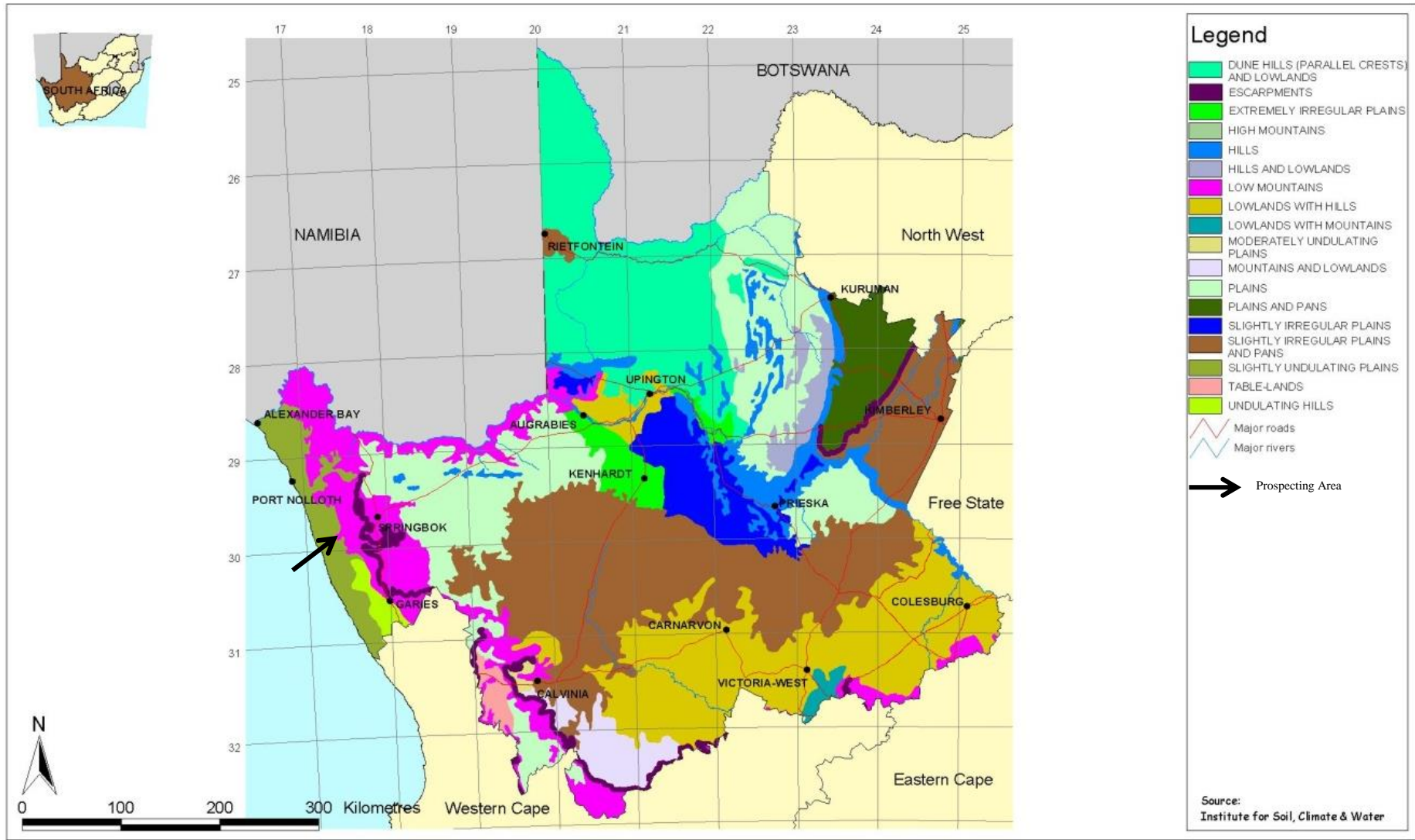
Red Kalahari sand (Hutton) overlies the entire site except where disturbed by previous mining. The upper 10cm sandy soil contains a little humus and grass seed. This is underlain by sand of similar type, and is on average a further 40 cm thick. It generally overlies dorbank and/or silcrete and/or clay. Given the high sand content of this material as well as the lack of vegetation cover, it is very susceptible to erosion (particularly wind erosion) and gully erosion in areas where storm-water is allowed to concentrate.

The subsoil (the overburden in this case) consists of various layers of sand, clayey sand/silt, dorbank and silcsete up to a maximum of 10m in depth.

Detailed soil information is not available for broad areas of the country. As a surrogate, landtype data was used to provide a general description of soils in the study area (landtypes are areas with largely uniform soils, topography and climate). There is a single main land type in the study area, the Fc land type (Land Type Survey Staff, 1987).

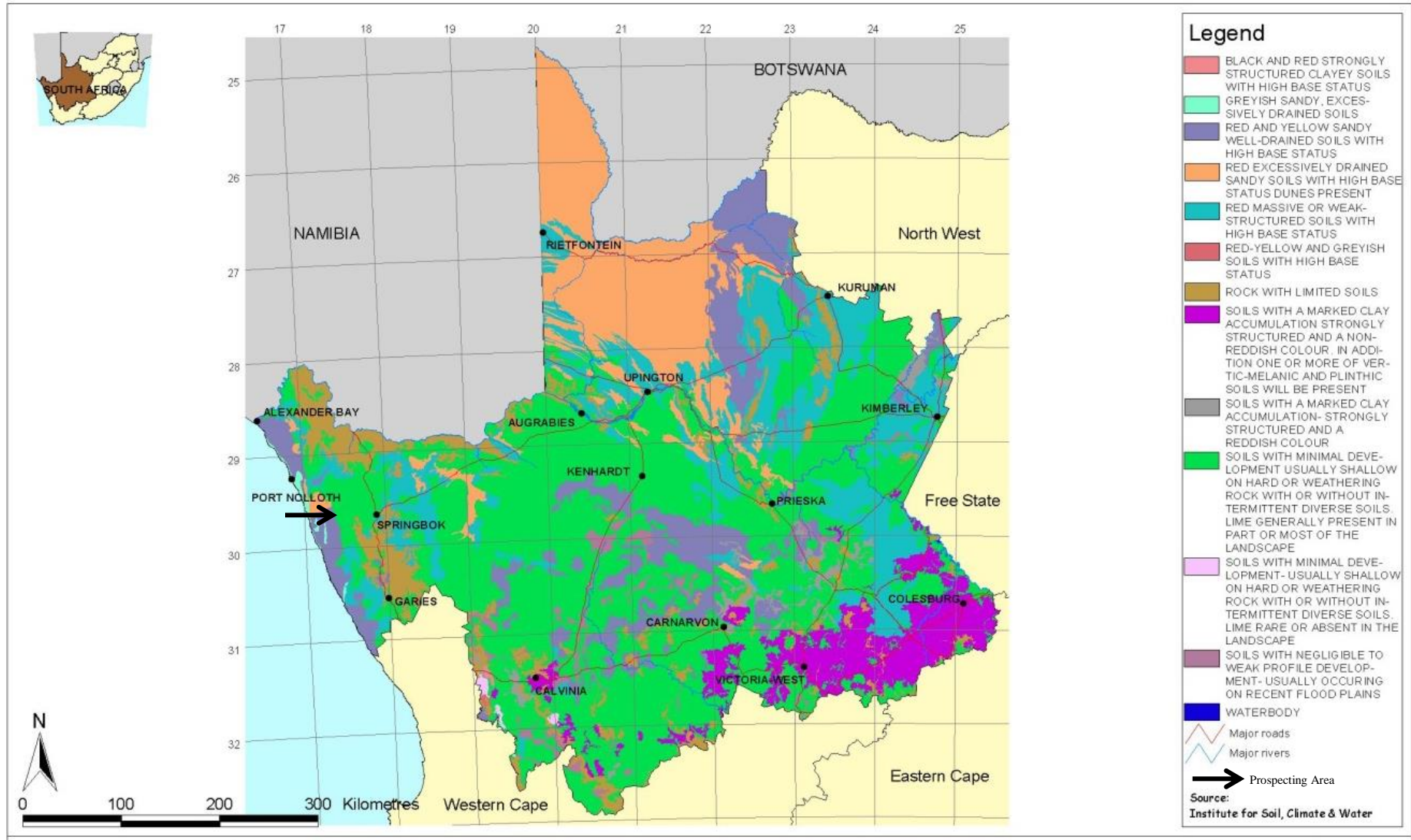
The F-group of land types refer to pedologically young landscapes that are not predominantly rock and nor predominantly alluvial or aeolian and in which the dominant soil-forming processes have been rock weathering, the formation of orthic topsoil horizons and, commonly, clay illuviation, giving rise typically to lithocutanic horizons (MacVicar et al. 1974). The soil forms that epitomise these processes are Glenrosa and Mispah (MacVicar et al. 1974). The Fc unit refers to land types where lime occurs regularly in upland and valley bottom soils (MacVicar et al. 1974). The productivity of the area is very low at 8-10Ha/SSU (Refer Map 3).

Map 2: Terrain Morphological units of the Northern Cape





**Map 3: Generalised Soil Description of the Northern Cape**



### Land Capability

The land is classified as wilderness area with subordinate grazing. This classification is more restrictive than pure grazing classification.

The carrying capacity of the veld is approximately 8-10ha / small stock unit (dependant on the tuning with regard to the rain/drought cycle). The aim of the rehabilitation programme is to restore the veld to its wilderness rating.

### Natural vegetation / plant life

Most plant growth is restricted to the relatively shallow topsoil layer. Plant rooting systems favors extensive networks of shallow roots. The area falls within the coastal plain (Strandveld) vegetation of the succulent karoo biome. Strandveld vegetation varies in height and this is associated with depth of calcareous sands.

Short forms of plants occur on exposed calcretes and characterised by the presence of the following dominant species: *Ehrharta calycina*, *E. villosa*, *Protasparagus capensis*, *Tetragonia frutescens* and *Zygophyllum morgansa*. Plants which are drought-deciduous with succulent leaves are fairly common. Short Strandveld is found on shallow soils with little storage of moisture. Plants reflect the aridity of the substrate, are very short and considerably succulent. Projected vegetation cover of perennial species is usually less than 50%. Heuweltjies are prominent features and the plant community found on these show an increase in the dwarf succulent components, grading into Succulent Karoo vegetation with an increase in distance from the sea.

Dominant species in this short Strandveld vegetation includes *Cephalophyllum spongiosum*, *Galenia fruticosa*, *Mesembryanthemum barklyii*, *Othona longifolia*, *Zygophyllum cordifolium* as well as *Ruchsia* spp.

Medium Strandveld has taller shrubs and a greater grass component. Canopy cover is in the range of 50% to 60% resulting in a "pockmarked" appearance to the veld. Typical dominant species include *Arctotis merxmuelleri*, *Cephalophyllum* spp, *Drosanthemum* spp, *Manochlamys albicans* and *Ruchsia robusta*.

Tall Strandveld occurs where deeper calcareous sands occur. It is fairly dense with a canopy cover of 65% to 75%. This 1m to 2m tall shrubs are dominated by *Ericophalus racemosus*, *Salvia aurea* and *Zygophyllum morgansa*. The tall Strandveld vegetation takes years to develop to its full potential. Inland from the coast overgrazing can lead to irreversible changes and Cape Fynbos elements take over this niche. The only trees occur along the bank of the drainage channels and are represented by *Acacia karoo*.

The Namaqualand Coastal Belt succulent scrub on site is dominated by:

- Non-succulents including:
  - *Galenia fruticosa* and *G. africana* (kraalbos)
  - *Salsola* cf. *kali* (tumbleweed)
  - *Zygophyllum* sp.
  - *Salsola aphylla* (lye - ganna)
  - *Salsola calluna* (swartganna)
  - *Tetragonia spicitata*

Succulents including:

- *Euphorbia* sp.
- *Crassula* sp.
- *Ruschia* sp.

The natural vegetation type per se is not a threatened unit and because of the extensive previous disturbance of this site (other than the proposed prospecting) no



specific botanical survey was conducted to measure the local & regional conservation worthiness, but wish to reflect on the following aspects to reduce any potential impact:

- Movement areas must be clearly demarcated and any movement outside of these areas must not be allowed
- No ad hoc roads, dumping or topsoil borrowing
- Observations have revealed that red aeolian topsoil, if placed on rehabilitated surfaces, no matter how thin (suggested min 25mm) promotes pioneer re-vegetation during the first season followed by Mesembryanthenums by year 3
- Topsoil, if directly re-used has immediate re-vegetation results given the seed bank present in the topsoil.
- Un-topsoiled subsoil, dumps or disturbed areas do not re-vegetate

### **Animal Life**

No rare species were reported and given the extent of similar land types in the area, any rare or endangered species will migrate to the surrounding habitat. Large herbivores are absent due to the competitive land use.

### **Surface Water**

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 250 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 only impact is the abstraction of process water from the Buffels River at a rate of <math>5\text{m}^3</math> per day for 15 days per month and most of it will be recycled. The taking and storing of water is covered by a General Authorisation in terms of section 39 of the National Water Act, 1998 (Act No. 36 of 1998). An application for the registration of the water use was submitted to DWAF.

### **Groundwater**

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. The majority of towns and farms rely on groundwater resources for potable 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 120m depending on the season. No groundwater will be used during the prospecting operation.

### **Air Quality**

The air background quality in the area 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.

Existing pre-mining dust is generated through the following:

Dust generated by wind over un-vegetated or denuded areas.

Dust generation off un-surfaced roadways on site and on the R355.

Exploration activities will take place in a very remote area and dust generation will be limited to a small radius around the drilling and excavation operation. If the dust however becomes a nuisance or health risk, dust will be suppressed with spraying water and/or dust-allaying agents.

### **Noise**

Only traffic-generated noise on the R355 occurs in the area at present and such noise levels are low (observed estimate at  $\pm 55$  dBA).

Noise from earth moving equipment and machinery will be within the norm and due to the remote locality of the operation will have no impact.

- 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

Given the extent of the activities on site to date and the high cost of a visit to this isolated site, no phase 1 archaeological study has been conducted.

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 permit 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 prospecting area.

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

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. The area is also disturbed by historic mining activities. Any mining operation developed as a result of prospecting operations will however have a positive impact on the socio-economic environment in the form of skills development and job creation.

### 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

As prospecting will take place on an area that is heavily impacted by historic mining activities all the impacts already exist and no new impacts will be created by this prospecting operation. The implementation of the mitigating and management measures prescribed in the section 3 will address all the existing and new impacts

and after implementation of the mitigating measures most impacts can be classified as insignificant especially when looking at the current state of the environment  
The excavation of trenches without the possibility of backfilling will have a significant negative impact on the visual aspect of the generally flat topography.

In most cases the topsoil cannot be distinguished from the subsoil and in many areas were destroyed by historic mining activities.

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

Due to the change in topography there is a significant impact on visual aspects. This impact can be increased with the absence of an adequate waste management system.

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 interested parties for comment. All comments received were addressed in this EMPR. The Local Authority was notified by means of a registered letter see copy attached. Meetings were held with De Beers see notes of the meeting attached. Carpediem was notified by means of a registered letter see copy attached. No Consultation with landowner necessary as the land belongs to the applicant refer proof of ownership attached.

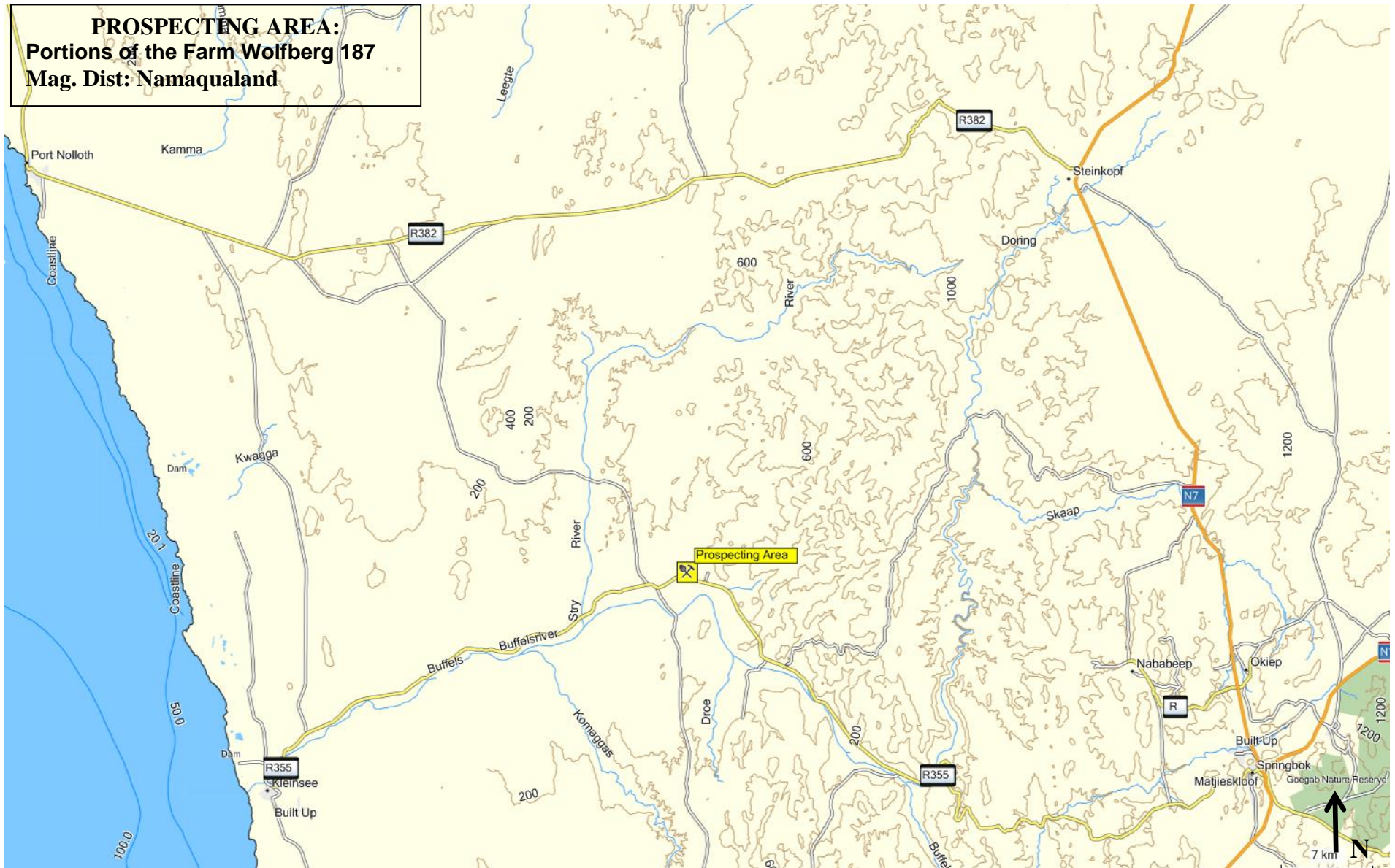
All other interested parties were invited to comment on the proposed project by means of an advertisement in the local newspaper copy attached.

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

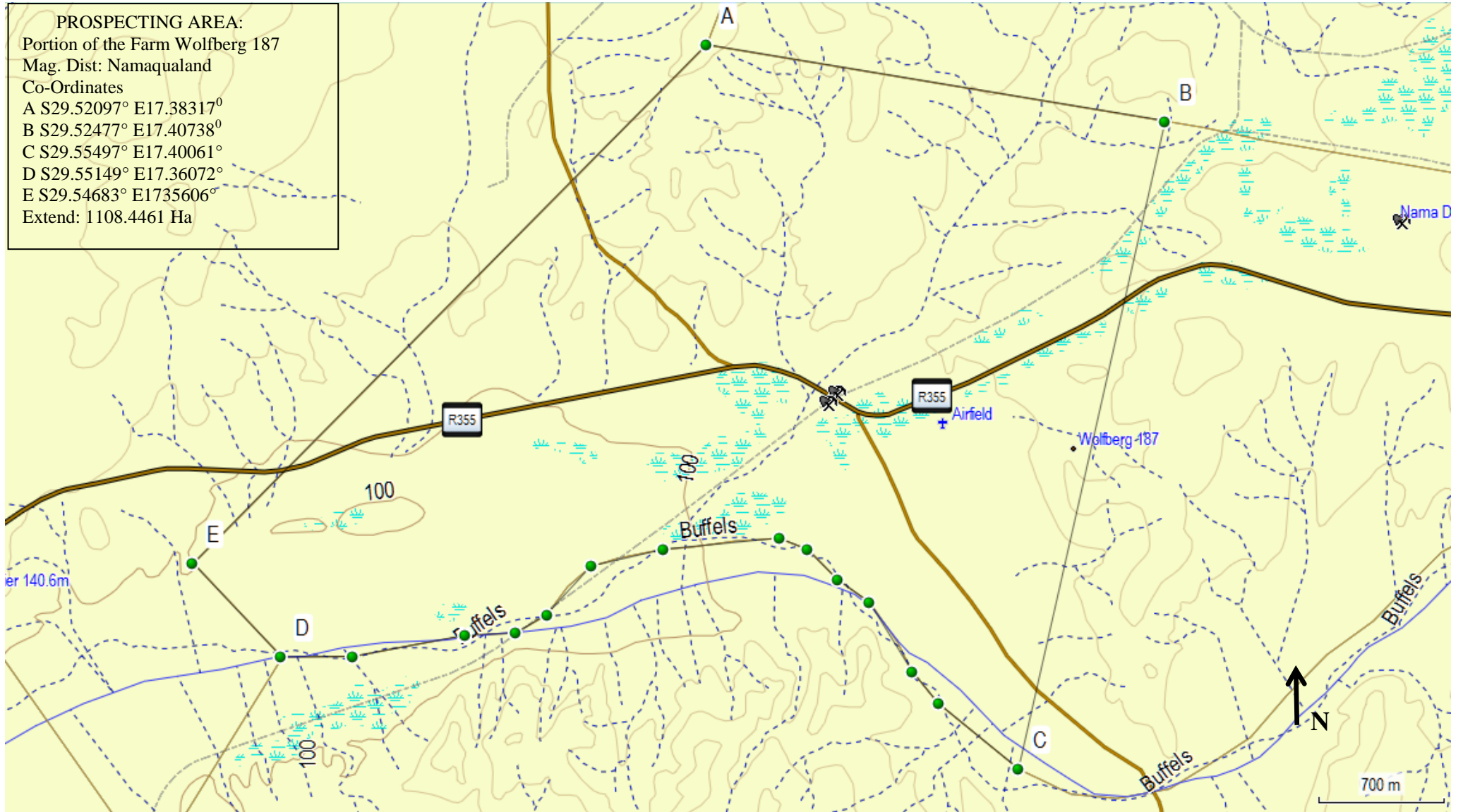
Refer maps 1, 2 and 3 above and map 4 and 5 below

The plans 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.

Map 4: Locality plan



**Map 5: Locality in relation to farm boundary**





## **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 The main prospecting activities (e.g. access roads, topsoil storage sites and any other basic prospecting design features )

The proposed prospecting operation is the generic methods applied in the prospecting for diamonds. The evaluation of a diamond deposit is the process followed to establish economic viability and to identify the “footprint” of the deposit.

The “footprint” is a profile of the type of diamonds present, which may be important for market planning. Economic sensitivity analyses indicate that all diamond deposits are most sensitive to diamond value and grade, and these are the dominant factors that influence the decision to proceed with a project.

The objective of the sampling during this operation is to obtain accurate estimates of the in-situ volume, diamond content and potential revenue of the deposit with increasing levels of confidence.

#### The Evaluation Phases

A phased approach to evaluation is adopted because of the relatively high cost involved in collecting and processing macro diamond samples. The objective of the preliminary evaluation phase is to establish the global macro diamond grade and an initial estimate of value per carat to arrive at an Inferred Resource. If the results of this work are favourable, the project may move on to the evaluation phase, where local grades and macro diamond values are established to arrive at a Measured Resource.

If conceptual economic modelling of the measured resource indicates that the deposit may be viable, then the project will move to the feasibility and mining phase.

A risk decision may be made to skip phases of the process for example the project may proceed to feasibility and mining directly from the preliminary evaluation stage.

A risk decision is made each time a project moves or does not move from one phase to the next. The way risk decisions are managed is to enter the available geological data into economic models with variables such as operating costs, capital costs, recovery factors, dilution, stripping ratios, etc. The effect of changes in parameters such as diamond values, new technology, royalties, etc, can then be recognised in terms of their effect on the potential return on investment for the project.



Phase	Activity	Skill(s) required	Timeframe		Timeframe for outcome	Technical expert to sign off on outcome
Phase 1 Non-invasive Desk top studies	Literature Study Imagery Analysis Geological Mapping Geophysical Survey	Geologist Project Manager	Month 1-12	Maps, plan & report on previous work Demarcation of drilling traverses	Month 12	Geologist
Phase 2a Preliminary Evaluation Phase Scout Drilling	Closed circulation compressed air drilling	Drill rig foreman Geologist	Month 13-18	Geological samples to determine the presence of potential deposits	Month 30	Geologist
Phase 2b Preliminary Evaluation Phase Infill drilling	Closed circulation compressed air drilling	Drill rig foreman Geologist	Month 19-24	Sample representative of a larger part of potential deposits Delineated target for further preliminary evaluation.	Month 30	Geologist
Phase 3 Preliminary Evaluation Phase Trenching	Mini-bulk samples totaling between 20 and 200 tonnes	Geologist Laboratory with XRD & XRF facilities	Month 25-36	Geological samples for metallurgical processes to extract data. Increased level of detail with emphasis on gravel continuity and variation of bedrock profile as well as building up the grade and diamond inventory	Month 54	Geologist
Phase 4 Evaluation Phase Bulk Sampling Trial mining	Estimated 10 000 tons of concentrate to be processed per major gravel deposit	Geologist Project Manager Economist	Month 37-48	Determine the grade and value of the deposit more accurately. Information collected during this phase is essential for mine (including treatment plant) design. Turning resource into reserve	Month 54	Geologist Project Manager
Phase 5a Feasibility Phase	Final analysis, quality control, database update and first stage of resource estimation	Geologist Project Manager Economist	Month 49-54	Incorporating the geological model into a detailed mining scenario model incorporating geotechnical, engineering, fiscal, environmental and metallurgical parameters, to determine the probable return on investment, and how best to mine it	Month 60	Project Manager Economist
Phase 5b Feasibility Phase	Application for mining right or decommissioning and closure	Project Manager Economist	Month 55-60	Decision making if results prove negative then decommissioning and closure or continue with trial mining. Mining right or Closure certificate	Month 60	Project Manager

### 2.1.2 Plan of the main activities with dimensions

Map 4 show the main land uses on the proposed prospecting area and as can be seen more than 99% 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 only prospecting related activity will be the development of drill sumps and prospecting trenches to be developed during the operational phase. The development and dimensions are described in the operational phase below.

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.

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

#### **Construction phase**

No infrastructure or roads will be constructed due to the specific nature of the operation and activities on the site to date. No processing will take place that need infrastructure to be constructed except for a mobile plant (refer photo below) and mobile chemical toilet.

Photo 1: Mobile pan plant to be used



## Operational phase

### Phase 2: Drilling

Invasive prospecting by means of drilling will continue on the targets identified during phase 1. Drilling of maximum 20 holes on target area (grid 100 X 100m) totalling an estimated 800m of closed circulation compressed air drilling is planned to get a full picture of the valley bedrock profile and intersect any protogravels which might lurk beneath the pervasive sand cover.

This phase will include the following:

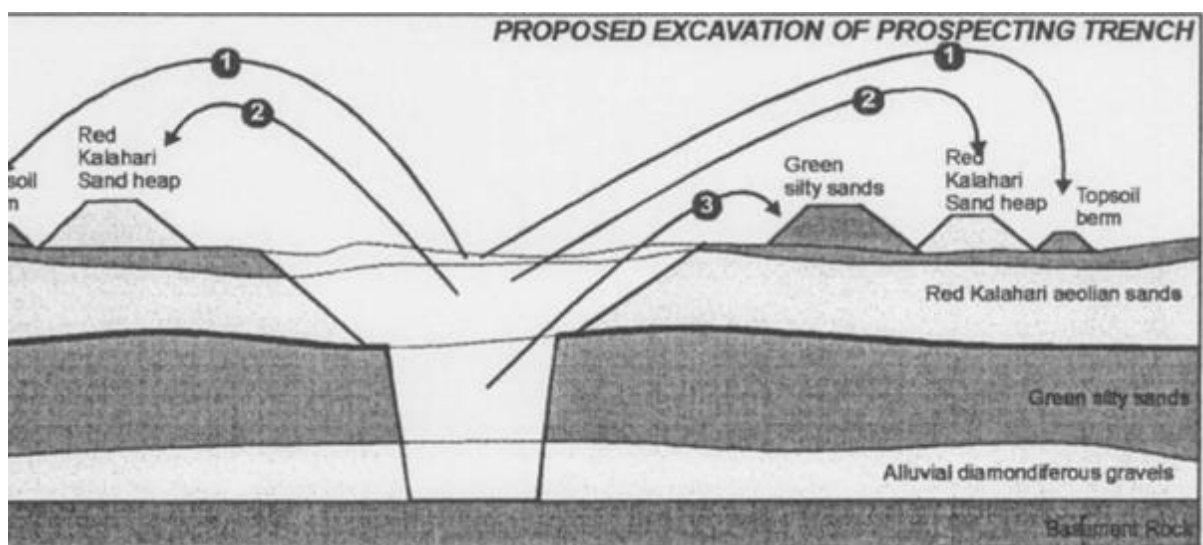
- Transport and installation of drilling equipment
- Drilling of maximum 20 holes on target area (grid 100 X 100m)
- Rehabilitation of drilling traverses.
- Updating of layout plans to reflect progress
- Performance assessment and update of quantum of financial provision for rehabilitation.
- Final analysis of results to determine future options Depending on results options exist as follows:
  - if results prove negative then decommissioning and apply for closure
  - if results prove positive then continue with phase 3 trenching
  -

### Phase 3: Prospecting Trenches

A Prospecting trench will consist of a trench located perpendicularly to the alluvial channel. There will only ever be one prospecting trench open at any given time and it is anticipated that no more than 3 such trenches will be developed.

Prospecting trenching will consist of the following procedures:

- Remove topsoil to either side of the eventual pit lateral extension as shown in the diagram below. The upper 40cm will be treated as topsoil as it contains a seed bank at present.
- Then remove the red Aeolian sand below the "topsoil" cover to separate stockpile berm.
- The green silty sand below the old surface will then be stockpiled on a separate stockpile to expose the gravels.
- The gravels will then be mapped and a decision will be made on whether to continue with bulk sampling.
- Collect geological samples of 20 to 200 ton to be treated by a laboratory with XRD & XRF facilities

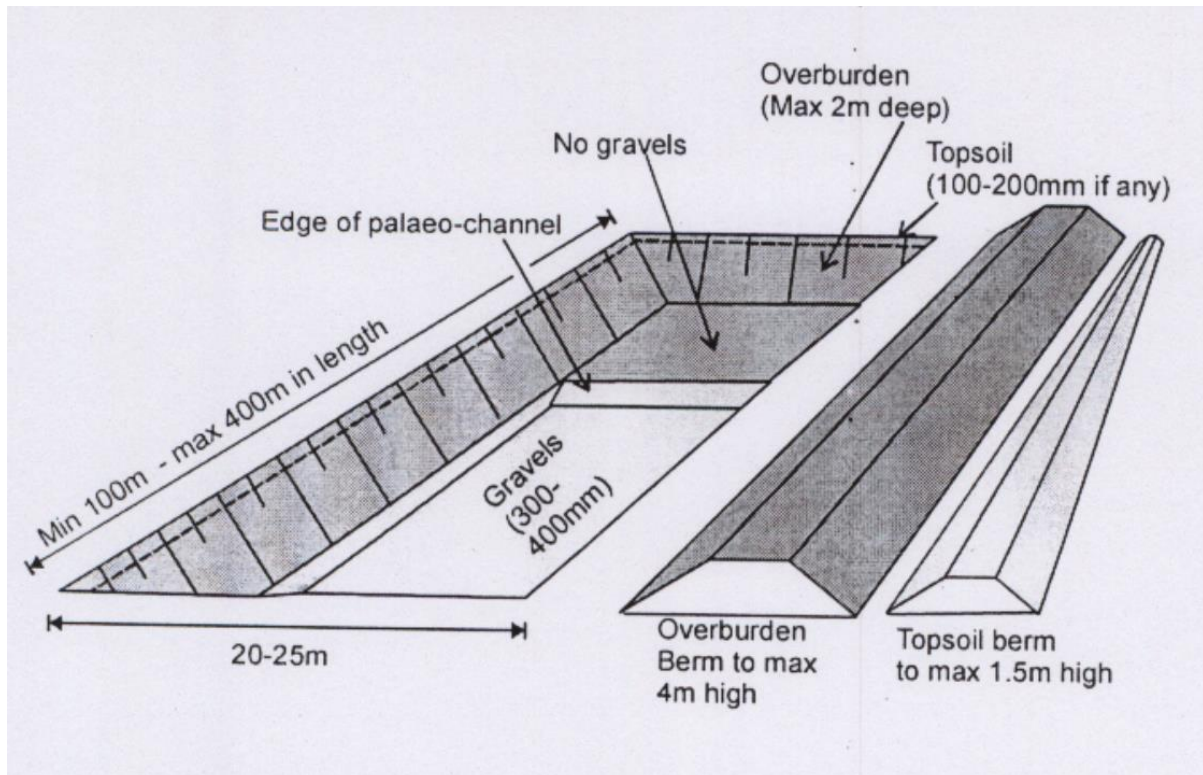


The following are pertinent with regard to the prospecting trench development:

The trench width will be determined by:

- Overburden depth. The deeper the overburden, the wider the trench will be at the surface.
- The angle of repose and safety of the sidewalk in terms of slumping. The operator on site must determine these, as they are in situ safety considerations.

The trenches will be developed in an area of shallow overburden (approximately 1.5-2m deep). The trenches will be developed to 100-400 m long x 20-25m wide.



Apart from gravel resources calculations the information will be used to construct gravel thickness, overburden thickness and bedrock elevation contour plans.

The trenches will be backfilled if results are unfavourable.

#### *Phase 4: Bulk sampling*

If any one of the trenches yields positive results, then a bulk sampling process will be initiated in that prospecting trench through widening of the trench along a length of that trench.

A bulk sample will consist of a box cut excavated perpendicularly to the paleo channel. The footprint of the proposed box cuts will be 70 X 70 meters (0.5Ha). There will only ever be one box cut open at any given time and it is anticipated that no more than 2 such cuts will be developed.

Bulk sampling will consist of the following procedures:

- Remove topsoil to either side of the eventual box cut lateral extension. Note that the upper 30cm will be treated as topsoil as it contains a seed bank. Say  $5\,000\text{m}^2 \times 0.3 = 1500\text{m}^3$
- Then remove the overburden average 1 meter below the "topsoil" cover to a separate stockpile berm. Say  $5\,000\text{m}^2 \times 1\text{m} = 5\,000\text{m}^3$
- Extract alluvial material to a depth of 1.5m. Say  $5\,000\text{m}^2 \times 1.5\text{m} = 7500\text{m}^3$  alluvial gravel

- From 2 pits 3000m<sup>3</sup> alluvial gravel will be extracted or 1150 tonnes at an SG of 2.6
- An average of 500 tonnes could then be processed from each of the two potential gravel deposits

The removed gravel will be sent through an in-field screening plant and only the concentrate will be trucked to the processing plant.

The applicant requires 250tonnes of concentrate product to obtain a representative sample for sufficient statistical analysis. 250tonnes of concentrate represents 50% of the ore therefore 50% will be backfilled through infield screening. When bulk sampling has been completed, then the entire excavation must be backfilled with the removed material in reverse order (starting with the in-field screened gravel).

### **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-

#### **2.1.4 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 an mining 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;	Not applicable



	(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	
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 and listed activities

Prospecting will only consist of the development of drilling traverses and prospecting trenches and no infrastructure including roads will be constructed. No processing will take place during the initial prospecting phases and when bulk sampling is to take place as a final stage of this project a mobile wash plant will be constructed next to the excavation.

The only activity that will have a potential impact on the environment will therefore be the development of the excavations during the trenching and bulk sampling program. The potential impact of this activity on the different environmental aspects will be as follow:

**Topography** - The excavation of the trenches without backfilling will have a significant negative impact on the generally flat topography. Excavations can also lead to erosion.

**Soil** - The potential exist for ad hoc tracks to be developed. Soil compaction is also a possibility due to hauling and development of stockpiles. Soil pollution is also a possibility due to oil spills during routine maintenance of equipment.

**Natural Vegetation** – Prospecting can have a potential impact on the natural vegetation due to excavations and stockpiles.

**Surface Water** – Abstraction of water for industrial purposes during processing of gravel will have an impact.

**Ground water** - Any mining if to continue below the water table can have a potential impact on the groundwater. Oil pollution can also have an impact on groundwater.

**Visual Impact** - Due to the change in topography there is a potential for visual impact through the presence of stockpiles and the excavation. The earthmoving equipment and general activities on site can also cause visual impact.

### 2.2.2 Potential cumulative impacts

Singly, many of the effects of prospecting on the environment may well be insignificant. However, when they occur simultaneously or in a haphazard way, their significance may increase by orders of magnitude.

The majority of impacts are localized i.e. affect the immediate vicinity of the prospecting area only. However many mines occur in the same area and therefore the cumulative impact became significant and may be felt over a much larger area.

### 2.2.3 Potential impact on heritage resources

Due to the extent of mining activities to date no further impact on any heritage resources are foreseen. No fossils have yet been reported in any of the mining operations. 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 prospecting area.

Cultural landscape elements are lacking on the site. The sense of place will be affected, however, but, due to the relatively limited extent of the visual impacts in the area, this impact is not considered very significant. Impacts to the sense of place are likely to be generally low due to the already altered state of the local 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 mining and due to the positive change in land use and small scale of the operation prospecting will not have any additional impact and the land will revert back to its former use grazing with an improvement in 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.

### 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 small extent of the proposed prospecting area.

## **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

#### 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**

High Significance	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
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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 Minor disturbances to aquatic ecosystems or local water resources Impact temporary Important but easily controlled by routine management actions
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

#### Criteria used for the significance rating

- All surface disturbances are rated moderate to high depending on footprint
- Dust is rated low if only minimal dust is expected to accumulate over the permit period, medium if it is expected to require dust suppression such as watering, and high if there is a risk that it will migrate beyond the permit area.
- Noise is rated low if no machinery is to be used, medium if machinery is to be used, and high if there is a potential for complaints from public and neighbours.
- All drainage is rated moderate if the impact is temporary otherwise high
- All blasting is rated high
- All dust and noise from loading, hauling and transport is rated moderate
- Drainage from ablution facilities are rated moderate

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

##### Potential impact during Construction

Considerable changes take place as the mine infrastructure, plant and facilities are constructed, and when the ore body is first exposed. The scale and sequence of events varies from mine to mine, but always entails dramatic changes to most features of the local environment. The following is generic activities with regard to construction with potential environmental impact. Due to the specific nature of the operation not all activities will take place during this mining operation.

Potential Activities	Applicable to operation
Stripping/storing of topsoil	Yes for virgin areas
Preparation/levelling of sites	Yes for virgin areas
Installation of mine and surface water treatment plants	Not applicable
Construction of mine facilities, offices and roads	Not applicable
Construction of storage facilities	Already exist
Landscaping of site	Not applicable
Construction of staff housing and infrastructure	Already exist

<b>Potential environmental impacts</b>	<b>Category</b>
Fauna and flora habitat loss and disturbance	Natural Vegetation
Reduction in biodiversity on site	Natural Vegetation
Decreased aesthetic appeal of site	Aesthetics Visual
Altered drainage patterns and runoff flows	Topography
Increased erosion of site area	Soil
Increased siltation of surface waters	NA
Altered landforms due to construction	NA
Contamination of surface and groundwater by seepage and effluent discharges	Ground water
Discharge of contaminants via mine dewatering activities	NA
Increased demand on local water resources	NA
Ground and surface water contamination from seepage and contamination from fuel spills and leakages	Ground water

**Potential impact during Operation**

- Removal and storage of ores and waste material

The routine operational phases account for most of the environmental impacts and are considered to have the greatest potential to drive environmental change

<b>Potential Activities</b>	<b>Applicable to operation</b>
Stripping/storing of top soil	Yes for virgin areas
Waste rock overburden stockpiles	Yes
Low grade ore stockpiles	Not applicable
High grade ore stockpiles - concentrate	Yes
<b>Potential environmental impacts</b>	<b>Category</b>
Land alienation from waste rock overburden stockpiles and disposal areas	Topography Natural vegetation
Increased erosion and siltation of nearby surface water bodies	Yes

- Processing - Milling and grinding Extraction/Concentration

The extent to which mining operational activities act as drivers of environmental change depends in part on the type, scale, duration and magnitude of the activities, and the sensitivity of the receiving environment

<b>Potential Activities</b>	<b>Applicable to operation</b>
Transport of ore to crusher/screening/washing plant	Yes
Preliminary crusher/screening/washing of ore	Yes
Milling and grinding of ore	Not applicable
Flotation and chemical concentration/leaching of ore and final product	Not applicable
Transport of ores to smelter	Not applicable
Stockpiling of final product	Not applicable
<b>Potential environmental impacts</b>	<b>Category</b>
Ground surface disturbance	Natural Vegetation
Disturbance due to noise and vibrations	NA
Dust and fumes, mine vehicles and transportation systems	NA
Discharge of contaminated water	Yes
Windborne dust and radionuclides	NA
Vapour emissions from processing	NA
Spillage of corrosive liquids	NA

- Transport of final product to market

Seldom associated with significant impacts on the biophysical environment

<b>Potential Activities</b>	<b>Applicable to operation</b>
Packaging/loading of final product into transportation	Not applicable
Transport of final product	Not applicable
<b>Potential environmental impacts</b>	<b>Category</b>
Disturbance due to noise, vibration and site illumination	NA
Dust and fumes from exposed product stockpiles	NA

#### Potential impact during Mine closure and post operational waste Management

Impacts often continue long after the mine has stopped production and has been closed especially if site is un-rehabilitated.

<b>Potential Activities</b>	<b>Applicable to operation</b>
Decommissioning of roads	Slim possibility
Dismantling buildings	Not applicable
Reseeding/planting of disturbed areas	Not applicable
Re-contouring pit walls/waste dumps	Yes
Water quality treatment	Not applicable
Fencing dangerous areas	Not applicable
Monitoring of seepage	Yes
<b>Potential environmental impacts</b>	<b>Category</b>
Loss of productive land for alternative uses	Natural Vegetation
Subsidence, slumping and flooding of previously mined areas	Topography
Continuing discharge of contaminants to ground and surface water via seepage	Soil
Changes in river flow regimes with sharper flow peaks and reduced dry season flows	NA
Fauna and flora habitat loss and disturbance	Topography
Windborne dust	NA
Dangerous areas that pose health risks and possible loss of life (e.g. pits, ponds, etc.)	Topography

The following is the main activities that will take place during the operational phase and that will have an impact in terms of spatial disturbance:

#### Access Roads and Tracks-

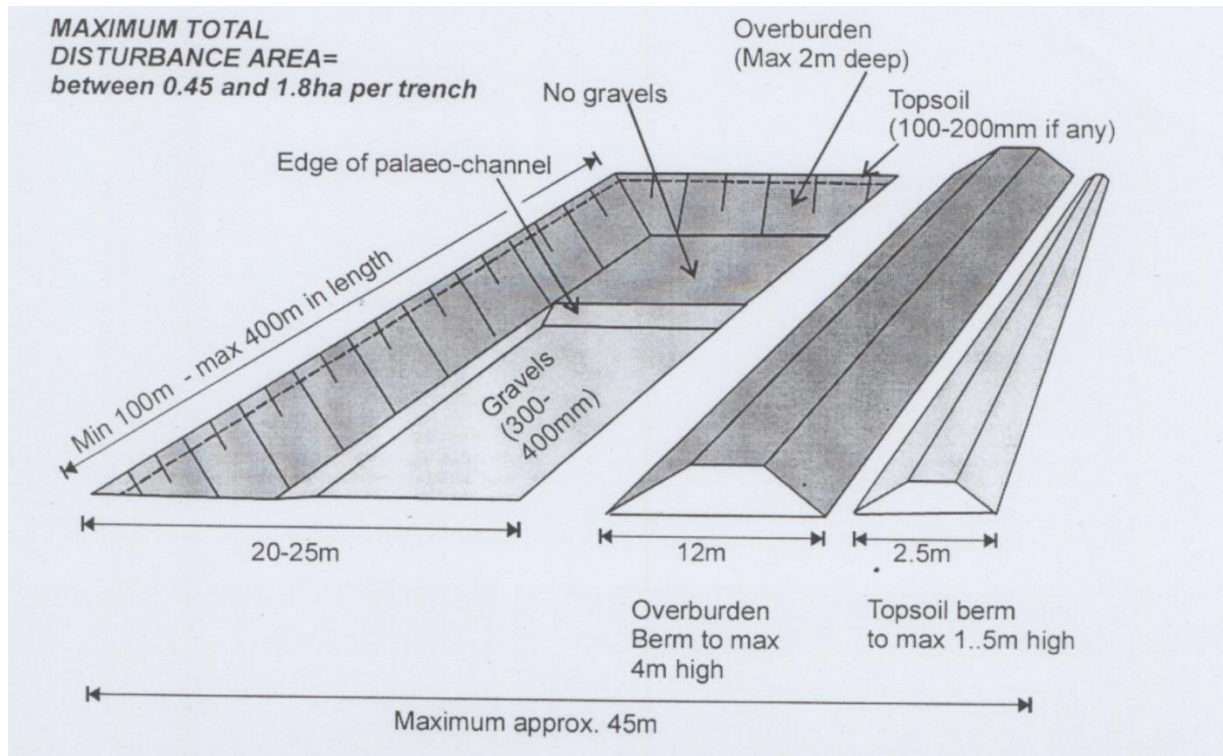
Use of existing roads is emphasized. The existing formal (but un-surfaced) roads will be used. Formal roads (i.e. with imported material) will only be developed over short distances if at all where traffic exceeds a very nominal amount, as experience by farmers has shown that tracks quickly become degraded 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).

#### Prospecting trenches

A maximum of 3 trenches will be developed to test for the presence of diamondiferous material and presence and flow direction of palaeo-channels. Each measuring a maximum of 250 X 20m and maximum 1.5m deep. The topsoil and

overburden will be temporarily stockpiled to the side of the trench for later backfill during the rehabilitation of the site yielding a total disturbance area footprint of 250m X 45m per trench (1.2Ha) or a total disturbance area footprint of less than 5ha (for 3 prospecting trenches)

**Diagram 5: Footprint of trenches**



#### Bulk sample trenches

Only one bulk sample is planned if a diamond trap is discovered for metallurgical and test plant work measuring a maximum of 70m in length and on average 70m wide. The topsoil and overburden will be temporarily stockpiled to the side of the trench for later backfill during the rehabilitation of the site yielding a disturbance area footprint of 0.45ha.

The following is an assessment of the significance of the impacts that the above activities will have on the different environmental aspects.

- **Topography**

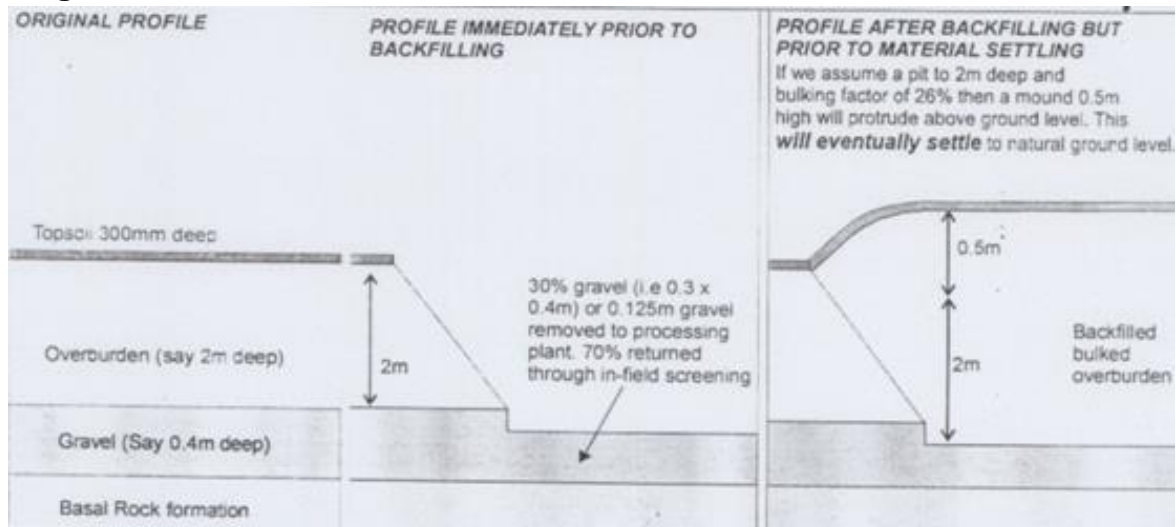
The impact of excavations on topography will be twofold:

- The excavations itself will be excavated to a maximum depth of 1.5 m over a maximum length of 250m to an average width of 20m
- The overburden will be dumped in a heap to 4m high across a width of 12m and the topsoil dump will cover a further 2.5m as shown in diagram 5 above

It must be noted that the overburden will bulk by 26% when backfilled. As such, a mound will remain after backfilling of the pit. Such mound will eventually settle without interference. The amount of gravel removed to the plant will have a negligible impact on the eventual topography as shown in the diagram 6 below:



Diagram 6: Rehabilitation of trench



Duration of impact  
Probability of impact  
Significance of impact

Life of phase 2 and 3

Definite

Insignificant for prospecting trenches but significant for bulk sample and increases as cumulative impact of 3 trenches and 1 bulk sample is considered.

- Soil

The prospecting trenches will result in the following impacts on topsoil & subsoil:

- Topsoil to at least 200mm will be removed from the excavation position prior to activities taking place. Such topsoil will be removed along with vegetation, seed and bulb bank. It will be stockpiled in a berm no higher than 1.5m to the side of the excavation as shown in diagram 5.
- Subsoil (i.e. the sandy overburden) will be removed to a maximum depth of 2m and stockpiled in a berm up to 4m deep alongside the trench as shown in the diagram 5.

The potential also exists for:

- Soil compaction due to hauling and development of stockpiles
- Developed of ad hoc tracks
- Oil fuel leaks onto virgin soil through the earthmoving and transport mobile plant
- The spillage of fuel during transfer from fuel bowser to equipment in the field

Duration of impact

Phase 2 and 3

Probability of impact

Definite for excavations and possible for oil spills

Significance of impact

Insignificant for prospecting trenches but significant for bulk sample and increases as cumulative impact of 3 trenches and 1 bulk sample is considered.

- Land Capability

The land is classified as wilderness area with subordinate grazing. This classification is more restrictive than pure grazing classification. In any event, the carrying capacity of the veld is between 8-10ha / small stock unit, but the aim of the rehabilitation programme is to restore the veld to its wilderness rating.

If we assume the worst-case scenario, in which all 3 trenches are developed to search for the palaeo channels together with one bulk sample, then a total of less than 8ha will be temporarily lost as a wilderness area (and as grazing). The impact

on grazing can be quantified: prospecting will result in the temporary loss of grazing for 1 small stock unit.

Duration of impact	Phase 2 and 3
Probability of impact	Definite
Significance of impact	Insignificant and temporary per site but increases when the cumulative impact is considered (until full rehabilitation of all sites has taken place).

- Natural Vegetation

Prospecting can have a potential impact on the natural vegetation outside the disturbed area on virgin soil due to stockpiles and track development. If we assume the worst-case scenario, in which all 3 trenches are developed to search for the palaeo channels together with one bulk sample box cut, then a total of less than 8ha will be temporarily disturbed when topsoil (and its vegetation content) is removed to the topsoil berm.

Duration of impact	Phase 2 and 3
Probability of impact	Definite
Significance of impact	Insignificant when considered separately but increases when the cumulative impact is considered and then significant.

- Animal Life

The animal life around the affected area will be chased away by the presence of such activities. There is a vast expanse of similar habitat type around every proposed activity area and it is unlikely that any impact on animal life will occur from the proposed activities. Should any impact occur it would be insignificant.

Duration of impact	Life of operation
Probability of impact	Probably
Significance of impact	Insignificant

- Surface Water

The only impact is the abstraction of process water from the Buffels River at a rate of <math>5\text{m}^3</math> per day for 15 days per month and most of it will be recycled. The taking and storing of water is covered by a General Authorisation in terms of section 39 of the National Water Act, 1998 (Act No. 36 of 1998). An application for the registration of the water use was submitted to DWAF.

The water will be used at the processing plant and all water less that which may be lost to evaporation will be returned as groundwater. Note the gravel is inert and no impact on groundwater quality will occur.

No impact on natural surface water quality or quantity will occur through the proposed prospecting excavations. However the potential exists for fuel/oil spillage onto the surface of the soil. The potential impact of such an occurrence will be limited by the implementation of the measures as proposed above.

Duration of impact	Life of mine
Probability of impact	Possibly
Significance of impact	Insignificant

- Ground Water

It is unlikely that groundwater will be encountered in the shallow prospecting trenches, however should it be encountered the impact would be negligible given the

small size of the pit and that up to 70% of the gravels will be returned to the hole (through infield screening) before backfilling with the overburden

Duration of impact	Phase 2 and 3
Probability of impact	Definitely will occur but will most likely be less than the maximum impact is described above
Significance of impact	Insignificant

- Air Quality

The dust impact is so minor as to not warrant any particular measures. However, employees must be supplied with masks (from a mine health and safety point of view).

Duration of impact	Life of mine
Probability of impact	Possibly
Significance of impact	Insignificant

- Noise

Noise will not result in any impact any land user or use during the prospecting pit development given the isolation of the sites. Provide employees with HPD's.

Duration of impact	Life of mine
Probability of impact	Possibly
Significance of impact	Insignificant

- Aesthetics Visual Impact

Due to the change in topography there is a potential for visual impact through the presence of stockpiles and the excavations. The earthmoving equipment and general activities on site can also cause visual impact. When quantifying the visual impact of the operation, such quantification must be conducted with complete isolation of the site in mind. Visual impact will thus occur through the following:

- The excavation will be visible from the R356 main road.
- The stockpiles and topsoil berms will also be visible
- The earthmoving equipment and general activities on site will also cause visual impact

Duration or impact	Phase 2 and 3 only as traffic passes the site.
Probability of impact	Definite
Significance of impact	Significant

### 3.1.3 Assessment of potential cumulative impacts.

Due to the remote locality of this operation with no other development in close proximity and small scale no potential cumulative impacts have been identified.

## 3.2 Concomitant list of appropriate technical or management options

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

Due to the small scale op operations less than 8 Ha total footprints for all disturbances and the fact that all disturbances will concentrate mostly in a disturbed area denude of all vegetation and excavations will be limited to 1.5m deep the significant impacts will be minimal. The only environmental aspects that will require mitigating and or management actions will be topography, visual impact, soil pollution and topsoil handling and natural vegetation.

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

#### Establishing access road to the site

- The access road to the mining area and the camp-site/site office must be established in consultation with the landowner/tenant and existing roads shall be used as far as practicable.
- Should a portion of the access road be newly constructed the following must be adhered to:
  - The route shall be selected that a minimum number of bushes or trees are felled and existing fence lines shall be followed as far as possible.
  - Water courses and steep gradients shall be avoided as far as is practicable.
  - Adequate drainage and erosion protection in the form of cut-off berms or trenches shall be provided where necessary.
- The erection of gates in fence lines and the open or closed status of gates in new and existing positions shall be clarified in consultation with the landowner/tenant and maintained throughout the operational period.
- No other routes will be used by vehicles or personnel for the purpose of gaining access to the site.

#### Construction

- Topsoil shall be removed from all virgin areas where physical disturbance of the surface will occur. The topsoil removed shall be stored in a bund wall on the high ground side of the mining area outside the 1: 50 flood level within the boundaries of the mining area.
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance of access roads.
- The topsoil stored in the bund wall shall be adequately protected from being blown away or being eroded.

#### Operation

- The liberation of dust into the surrounding environment shall be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.
- Regular maintenance of the access road shall be to the satisfaction of the Director: Mineral Development and the road shall have an acceptable surface, be free from erosion damage and have effective drainage, preventing the impounding/ponding of water.

#### On Closure

- Roads that will no longer be used shall be ripped or ploughed and if necessary, appropriately prepared to ensure the re-growth of vegetation.
- Materials, which may hamper re-growth of vegetation, must be removed prior to rehabilitation and disposed of in an approved manner.

#### General

- No vegetation will be removed to develop tracks as experience (by other prospectors) has shown that by not removing existing vegetation from area disturbed by traffic, the impact is that the vegetation is merely flattened and that

such vegetation recovers quickly. Vehicles must use the same tracks and no haphazard turning in virgin veld is to be permitted.

- Try where possible to use existing road structures.
- Maintenance of access road on the mining area:  
If trucks hauling concentrate or other traffic, which is associated with this mining operation, are the only user of access roads, then maintenance of the access road will be the sole responsibility of the holder of the prospecting right.
- In the case of dual or multiple uses of access roads by other users, arrangements for multiple responsibilities must be made with the other users. If not, the maintenance of access roads will be the responsibility of the holder of the prospecting right.
- Newly constructed access roads shall be adequately maintained so as to minimize dust, erosion or undue surface damage.

Establishing surface infrastructure - campsite/office, toilet facilities, waste water and refuse disposal and vehicle maintenance yard and secured storage areas

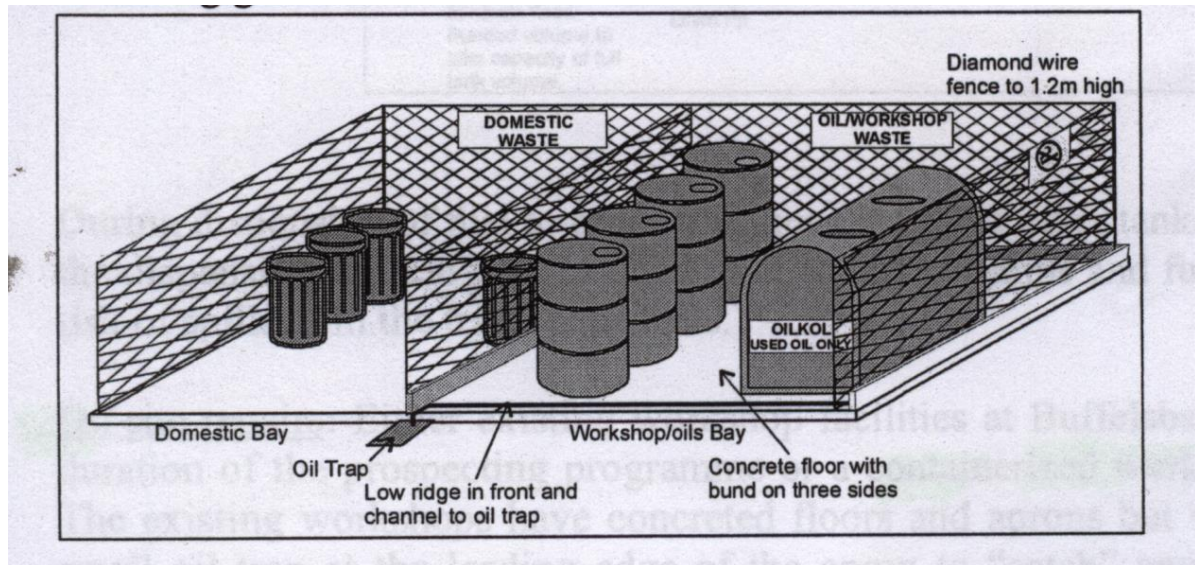
- No camp or office site shall be located closer than 100 metres from a stream, spring, dam or pan.
- Any vehicle maintenance yard and secured storage area will be established as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the mining/prospecting area.
- Chemical toilet facilities (preferred) or other approved toilet facilities such as a septic drain shall be used and sited on the camp site in such a way that they do not cause water or other pollution.
- The vehicle maintenance yard and secured storage area will be established outside of the flood plain, above the high flood level mark within the boundaries of the prospecting right.

Construction

- The area chosen for these purposes shall be the minimum, reasonably required for the purpose, and which will involve the least disturbance to the vegetation.
- Prior to development of the approved area, the top seed-bearing layer of soil to a depth of 500 mm shall be removed and stored in a bund wall on the high ground side of the area. The height of this bund wall shall not exceed 1.5 metres.
- In cases where toilet facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance shall be adhered to.
- The storage areas/buildings shall be securely fenced and all hazardous substances and stocks such as diesel, oils, detergents etc. shall be stored therein. Drip pans, a thin concrete slab or a PVC lining shall be installed in such storage areas/ buildings viz. bunded area.
- The storage area shall be securely fenced and all hazardous substances and stocks such as diesel, oils, detergents, etc., shall be stored therein. Drip pans, a thin concrete slab or a facility with PVC lining, shall be installed in such storage areas with a view to prevent soil and water pollution.
- The location of both the vehicle maintenance yard and the storage areas are to be indicated on the layout plan.
- No vehicle may be extensively repaired in any place other than in the maintenance yard.

- Equipment used in the mining process will be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
- Machinery or equipment used on the mining area will not be allowed to constitute a pollution hazard in respect of the above substances.
- The Regional Manager may order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.

**Figure 1: Proposed layout of temporary waste storage area**



#### Operation

- All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 100 metres, from a stream, river pan, dam or borehole.
- Only domestic type water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances shall be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility.
- Spills should be cleaned up immediately by removing the spills together with the polluted soil and disposing thereof at a recognised facility to the satisfaction of the regulators.
- Non-biodegradable refuse (such as glass bottles, plastic bags metal, scrap, etc.) shall be stored in a container at a collecting point and collected on a regular basis and disposed of at an authorised disposal facility. Precautions shall be taken to prevent any refuse from spreading on and from the campsite.
- Biodegradable refuse generated from the camp site, vehicle yard, storage area or any other area shall either be handled as above or be buried in a pit excavated for that purpose and by covering it with layers of soil, incorporating a final 0,5 metre thick layer of topsoil (if practical) or as specified by the local authority, if applicable.
- Suitable covered receptacles shall be provided and conveniently placed for waste disposal. All used oils, grease or hydraulic fluid shall be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a recognized or licensed disposal facility.



#### On Closure

- On completion of mining, all buildings, structures or objects on the camp/office sites, shall be completely removed (unless new uses of the building have been agreed) and the site should be fully rehabilitated.
- On completion of prospecting, the campsite/office site will be rehabilitated through the removal of all facilities, waste and any other feature constructed or established during use of the campsite.
- All areas, devoid of vegetation/grass or where soils have been compacted due to traffic, shall be scarified or ripped and, if necessary appropriately ensure the regrowth of vegetation.
- French drains shall be compacted and covered with a final layer of topsoil to a height of 10 cm above the surrounding ground surface.

#### General

- Only one mobile chemical toilet will be available for use during operations that will be removed at final closure
- Equipment used in the mining process, must be adequately maintained, such that during operation they do not spill oil, diesel, fuel or hydraulic fluid.

#### Establishing excavation, residue deposit, processing areas and waste piles

- In the case of areas that exclude prospecting through a special condition, no prospecting shall take place in these areas and prospecting shall not be conducted within 100m of these areas.
- Stockpiles and overburden dumps shall not be established within 20 metres of the edge of the river channel.
- Processing areas and waste piles shall not be established within 100m of the edge of any river channel or other water bodies.
- The areas chosen for this purpose shall be the minimum reasonably required and that which will involve the least disturbance to vegetation.

#### Construction

- The location and dimensions of the area are to be indicated on the layout plan and once established, all stockpiling and further processing of gravel will be confined to these areas and no stockpiling or processing will be permitted in areas not correctly prepared.
- New stockpile sites will be GPS located and pegged with steel droppers. The site will be inspected and photographed prior to any disturbance.
- The stockpile area needs to be demarcated to restrict operations to within the demarcated area.
- Prior to development of the approved area, the top seed-bearing layer of the soil shall be removed to a depth of 500 mm and stored in a bund wall on the high ground side of the area keeping disturbance to the native vegetation to an absolute minimum. The height of this stockpile wall shall not exceed 1.5 metres.

#### Operation

- Any waste material generated from the mining will be dealt with as described above.
- Topsoil borrowing from the virgin areas to cover disturbed areas will not take place and movement of vehicles will be restricted to demarcated areas so as to keep the footprint of the mining operation to the absolute minimum.
- At final closure all product needs to be removed from the stockpile areas and where product is mixed in with the subsoil the subsoil will also be removed.

### On Closure

- The goal of rehabilitation, with respect to the area is to leave the area level and even, containing no foreign debris or other materials.
- All scrap, and other foreign materials shall be removed from the area and disposed of as per other refuse, whether these accrue from the mining operation or are brought on to the site from outside.
- Removal of these materials shall be on a continuous basis while the mine is operating and not only at the start of rehabilitation.
- Tailings in the form of boulders, rocks or oversized gravel screened out during the mining process will be backfilled into the excavations before backfilling of overburden and covered by a minimum of 500 mm of topsoil.
- An effective control programme for the eradication of invader species and other alien plants may be required
- On completion of prospecting, the surface of the stockpile and processing areas shall be scarified to a depth of at least 500 mm, graded even and the topsoil previously stored adjacent to the site in a bund wall returned to its original depth over the area.
- The side walls of the excavation need to be sloped to form an even depression if not completely backfilled.
- The area shall be appropriately prepared, if necessary, (e.g. fertilized and seeded), to ensure the regrowth of vegetation.

### General

- Prospecting shall only take place within the approved demarcated prospecting area.
- Invasive activities and bulk sampling will be limited to the areas as indicated on the prospecting work program and layout plans.
- The prospecting area must be clearly demarcated by means of beacons at its corners, and along its boundaries if there is no visibility between the corner beacons.
- A copy of the prospecting work program and this EMPR with layout plans as provided for in Regulation 2.2 must be available at the prospecting site for scrutiny when required.
- The plan must be updated on a regular basis with regard to the actual progress of the establishment of surface infrastructure, prospecting operations and rehabilitation (a copy of the updated plan shall be forwarded to the Regional Manager on a regular basis).
- A final layout plan must be submitted at closure of the operation or when operations have ceased.
- No mine waste will be allowed to be deposited in natural drainage lines or erosion gullies without the necessary authorization from DWAF and a written permission from the DMD.
- Prospecting must be conducted in such a manner as to ensure that natural drainage lines are not destabilized and that surface and ground water quality is not impaired.
- Where a depression in the ground in which water can gather has formed, attention will be given to the outflow of water to prevent concentration of the run-off and thus prevent erosion.
- Stockpiles must be protected and not compacted.
- Tailings from the extraction process must be so treated and /or deposited that it will in no way prevent or delay the rehabilitation process.

### Establishing clarification ponds

Clarification ponds (fine residue dumps) serve as a facility to settle fines which will allow the water to be returned to the river or be recycled.

- The settling ponds shall not be located within the flood plain and will be sited in such a manner so as to cause the least disturbance to vegetation.
- Design, construct, maintain and operate any dam or tailings dam that forms part of dirty water systems to have a minimum freeboard of 0.8 metres above the full supply level (Government Notice No. 704, Section 6e, 1999).
- The position of the ponds, their size, depth and distance from the edge of the river channel shall be indicated on the layout plan.
- The final clarification pond shall be sized such that water discharged conforms to the water quality objectives in terms of the National Water Act, 1998 (Act 36 of 1998).
- Apply for a water use licence whenever disposing of waste in a manner that may detrimentally impact on a water resource.

### Construction

- After the position of the ponds and tailings dam and their size has been approved, the area is to be stripped of top seed bearing layer of soil to a depth of 500 mm. This soil thus removed shall be stored on the high ground boundary of the area in the form of a bund wall.
- Construction of the pond walls shall be from material excavated from within the area of the pond. The walls of the pond shall be constructed level and be given an overflow consisting of sized pipes installed a minimum of 800 mm down from the top of the wall (i.e. 800 mm freeboard) and of length to discharge fully into the next pond.
- In the case of the final clarification pond, the overflow pipes will be of such length that they discharge not less than 1.5 metres into the river.
- Under no circumstances will the overflow from one pond to another or from the final clarification pond to the river be allowed to flow across the ground or in excavated earth trenches.

### Operation

- Erosion damage to the pond walls from rain or spills will be repaired and filled in on a regular basis.
- Screen tailings: tailings from screens used at the settling ponds shall be collected and backfilled into the excavations.

### On Closure

- Settling ponds will be rehabilitated after first spreading tailings from the tailings dump evenly over the floor of the ponds, should this be the method chosen to rehabilitate tailings.
- The tailings will then be covered through spreading the previously excavated material from the pond's wall evenly over the area.
- The topsoil previously stored adjacent to the site shall then be returned to its original depth over the area.
- The area shall be appropriately prepared, if necessary, to ensure the re-growth of indigenous vegetation.

### General

- Where possible existing excavations shall be used as tailings dams.

## Ancillary management and mitigating requirements

### *Storm Water Management*

There are four primary principles that need to be applied in the development and implementation of a storm water management plan:

- Clean water must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system while preventing or minimizing the risk of spillage of clean water into dirty water systems.
- Dirty water must be collected and contained in a system separate from the clean water system and the risk of spillage or seepage into clean water systems must be minimized.
- The storm water management plan (SWMP) must be sustainable over the life cycle of the mine and over different hydrological cycles and must incorporate principles of risk management.
- The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated.

### *Erosion and Sediment Control*

Successful control of erosion and sedimentation from mining activities should involve a system of best management practices, which targets each stage of the erosion process.

- The most efficient approach involves minimizing the potential sources of sediment from the outset. This means limiting the extent and duration of land disturbance to the minimum needed, and protecting surfaces once they are exposed.
- The second stage of the best management practice system involves controlling the amount of runoff and its ability to carry sediment by diverting incoming flows and impeding internally generated flows.
- The third stage involves retaining sediment, which is picked up on the project site through the use of sediment capturing devices.

### *Domestic Waste Management*

The owner will instruct the employees in the need for procedure/tasks as well as the actual handling of domestic waste, relating to domestic waste management. Domestic waste (lunch wrappers, containers, food tins, bottles) of daily workers as well as the domestic waste from the mining logistics will be provided for and handled as follows:

- Provide waste collection drums at strategic points (workshops/personnel amenity area, residential and recreational facilities).
- Demarcate an area for and constructed as "temporary waste storage area" for temporary collection and storage of the drums, prior to delivery to Springbok disposal site for disposal. (On-site dumping/burial is not allowed without registration/licensing of such a site with the Department of Environment and Water Affairs in terms of the Environment Conservation Act).
- Instruct staff on the distinction between domestic refuse and industrial waste.

### *Industrial Waste Management*

Identify and demarcate (by fences) the following sites:

- A salvage yard for temporary storage of scrap steel and equipment prior to sale or removal as scrap. Arrange regular sale and collection of scrap from the site.
- A used oil collection and temporary storage area

- Temporary storage area for all used lubrication products and other hazardous chemicals
- No engines or other equipment parts are to be stored in the scrap yard without either having had the oil drained or suitable measures have been taken to prevent leaking of oil.
- Contaminated spares, oil filters, gaskets, etc. will be collected in a separate drum at the designated storage facility for disposal at a suitable site off-site. Waste oils from servicing of vehicles will be disposed of in the waste oil collection facility.
- Staff will require instruction in:
  - deleterious effects of oil / fuel on the environment
  - location and method of the storage of contaminated spares.
- Used oils will be stored in drums provided by the oil recycling companies such as Oilkol.
- A concrete, platform and fence with signposts is to be constructed to store used oil and drums containing used spares, cloths, etc. which are oil contaminated and must be temporarily stored for collection/dispatch to suitable regional disposal site.
- Staff will require instruction in:
  - deleterious effects of oil / fuel on the environment
  - location and method of the storage of contaminated spares and used oil
  - reasons for good fuel management and the alternative consequences

*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 on the 10km of gravel roads from the main tanks at the processing plant to the northern prospecting site.
- The fuel tank at the processing plant must be developed according to the following design guidelines:
  - Construction of a bund wall capable of holding the full capacity of the mobile tanks parked within it.
  - Construction of a concreted floor or PVC facility.
  - Construction of a concreted or PVC service apron sufficiently large to catch fuel spills during receipt and supply of fuel.
  - Such apron to be dished to lead rain-water or wash-water to drain pit (sump) for collection of oily-run-off and suitable decontamination disposal thereof.
- 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:*

- All repairs which are to take place on site will take place in the workshop.
- The workshop will be constructed with concrete floor and sloped apron from the entrance to the workshop.
- The apron will be constructed with a drain along its extremities to collect any oil contaminated run-off and channel it to the oil trap where separated oil will be collected and disposed of in the oil recycling container.

- Any oil spills on the concreted apron or floor is to be treated with Spillsorb (or equivalent) as per the product instructions.
- Waste oils from servicing of vehicles will be disposed of in the waste oil collection facility.
- Staff will require instruction in the:
  - deleterious effects of oil /fuel on the environment
  - identification of oil leaks on the concrete apron
  - the operation of the oil trap (including the disposal of trapped oil)
  - use of Spillsorb (or equivalent) products

#### *Emergency repairs:*

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.
- 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.

#### Site specific attenuation measures

##### *Topography*

- All rough material and overburden must be directly backfilled into existing excavations and all mine waste must be directly used as backfill material.
- No waste in the form of dumps or structures will remain on surface after closure of the operation.
- In the case of new prospecting trenches, the trenches are to be backfilled immediately after logging of results.
- The creation of new overburden dumps on natural ground level will not take place.

##### *Soils*

- New bulk sample sites and prospecting trenches will be GPS located and pegged with steel droppers.
- The site will be inspected and photographed prior to any disturbance.
- Topsoil will then be removed and vegetation cleared, keeping disturbance to the native vegetation to an absolute minimum.
- Any topsoil removed is stored separately for later reuse.



- The upper soil horizons ("subsoil") from the prospecting trenches will be handled as a cut-and-backfill strip mining method. This means that the stockpiles will be temporary and topsoil will be replaced on the backfilled excavation as part of the on-going rehabilitation process.
- Topsoil borrowing from the historic dumps to cover the subsoil backfilled into the historic excavations is an option in the case of extremely slow recovery of vegetation.

#### *Natural vegetation /Plant life*

- Movement areas must be clearly demarcated and any movement outside of these areas must not be allowed
- No ad hoc roads, dumping or topsoil borrowing
- Observations have revealed that:
  - Red aeolian topsoil, if placed on rehabilitated surfaces, no matter how thin (suggested min 25mm) promotes pioneer re-vegetation during the first season
  - followed by climax vegetation by year 3
  - Topsoil if directly re-used has immediate re-vegetation results given the seed bank present in the topsoil.
  - un-topsoiled subsoil, dumps or disturbed areas do not re-vegetate
- As such, topsoil management and re-vegetation programmes rely on:
  - Minimum disturbance
  - Re-top soiling with red soil
  - Direct re-use of removed topsoil on a strip mining basis
  - Top soiling to min of 10cm to promote basic growth
- Due to the absence of topsoil at the historic disturbances borrowing from the historic dumps to cover the subsoil backfilled into the historic excavations is an option in the case of extremely slow recovery of vegetation. This will however have a negative impact on the vegetation that has regenerate naturally on these dumps.
- Topsoil (upper 100mm horizon) offers the advantage of bearing the seed bank and the broken Mesems (after dozing), which will re-root. Observations are that the lower topsoil horizon (100mm to up to 0.5m in depth) still achieves the desired results in the re-vegetation programme. It merely takes a while longer i.e. no significant growth in the first year.
- With regard to new disturbances stockpiled topsoil will be placed on the backfilled excavation intermittently (to min 10cm depth) as part of the on-going rehabilitation process to promote natural re-vegetation, thereby restoring the land to its former state.
- All vegetation will be dozed along with topsoil into berms above the disturbed area to serve as cut-off for storm water. The topsoil berms will not exceed 2m in height in order to retain a viable seed bank.

#### *Animal life*

- During prospecting activities all staff must be educated about the role of wildlife in ecology and the tourism economy and warned against poaching.
- Management should conduct field inspections of the surrounding area of the mine for snares.

### *Process Water*

The bulk sample gravels will be processed at the processing plant to be developed as close as possible to the excavation.

Such plant has a capacity of 15tonnes/hour (at SG of 1.85tonnes/m<sup>3</sup> = 8.1m<sup>3</sup> gravel processed) and uses approximately 7.5kl of water per hour.

Assuming the plant runs at 80% of capacity, then 6.5m<sup>3</sup> gravel is processed in the hour using 7.5kl of water (a ratio of approximately 0.86m<sup>3</sup> gravel per kl (m<sup>3</sup>) of water or 1m<sup>3</sup> gravel requires about 1.2kl of water).

So per bulk sample it equates to the following water requirement:

50m gravel exposure length x 22m wide trench x 0.35m deep gravel= 385m<sup>3</sup> gravel

In field screening to remove +40mm material results in say 70% of gravel being backfilled into the trench i.e. 115m<sup>3</sup> being transported to the plant for processing

So at a requirement of 1.2m<sup>3</sup> water per m<sup>3</sup> gravel, approximately 138m<sup>3</sup> of water will be required per bulk sample, over a period of 2 weeks (or say 10-12m<sup>3</sup> day).

Approximately 60% of water is usually recycled from the fine tailings dam, therefore a maximum top-up requirement of 4 -4.5kl/day is anticipated.

The taking of less than 10 cub meter of water from the Buffels river do not have an impact on surface water users downstream in the affected water course and no river diversions will take place. The taking and storing of water is covered by a General Authorisation in terms of section 39 of the National Water Act, 1998 (Act No. 36 of 1998). The applicant will however in accordance with the general authorisation adhere to Record-keeping and disclosure of information.

The authorisation states that the water user must ensure the establishment of monitoring programmes to measure the quantity of water taken and/or stored, as follows-

- (a) the quantity of groundwater or surface water abstracted must be metered or gauged and the total recorded as at the last day of each month;
- (b) the quantity of water stored must be recorded as at the last day of each month.

### *Mineral Processing*

No mineral processing will take place on site, except for the infield screening of the prospecting pit gravels. Such infield screening at the bulk sample excavation will result in the requirement for the trucking of only 30% of the gravels to the processing plant.

Plant residue consists of the following material:

- Coarse tailings (-40mm + 1.5mm): Approximately 85% of the material sent through the plant will be discarded as coarse tailings. This will be added to the existing coarse tailings backfill of the excavation. It will make an insignificant contribution to the existing proposed backfilling of the pit.
- Fine tailings: Approximately 15% of the run of plant will be disposed of also as backfill of one of the excavations.
- Concentrate: Amounts to less than 1% of material passing through the plant. It will also be dumped as backfill in the excavation after sorting and removing of diamonds.

### 3.3 Review the significance of the identified impacts

The potential significant impacts as identified in paragraph 3.1 after implementation of the proposed mitigation measures and management options in paragraph 3.2 can all be regarded as insignificant.

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

### 4.1 Plans for quantum calculation purposes.

The closure programs consist of two distinct sequential phases, planning and implementation. The objective is to ensure that there is clear accountability and adequate resources for the implementation of the rehabilitation and closure plan. The following considerations have been taken into account in the management and implementation of the rehabilitation and closure plan:

- accountability for plan implementation – Section 2
- the resources needed to assure compliance with the plan – Section 3
- on-going management and monitoring requirements after closure – Section 4

Progressive rehabilitation is good practice and has advantages for both the company and the community. From the perspective of the company it reduces its overall financial exposure and may reduce the amount of the bond. From the perspective of the community progressive rehabilitation provides confidence in the rehabilitation process as well as reducing the scale of the mining site.

Rehabilitation has now become one of the most important considerations when designing and operating a mine. Not only the visual impact of overburden and tailings dumps is considered, but also excavations and their visual impact and the change in land use are considered.

In order to minimize the impact on the environment rehabilitation will take place on a continuous basis together with prospecting.

Operations are conducted in an area that has already been disturbed, and the holder has reach specific agreements with the Regional Manager concerning the responsibilities imposed upon them pertaining to the rehabilitation of the area and the pollution control measures to be implemented and the company is responsible for all surface disturbances on the prospecting area, which includes all historical surface disturbances within the boundaries of this application area.

### 4.2 Alignment of rehabilitation with the closure objectives

The goal of rehabilitation with respect to the area where prospecting 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 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 Springbok the closest major town 150Km to the east. The provision for rehabilitation of the site will be supplied by means of a bank guarantee to be supplied to the Department of Minerals & Energy. The purpose of such a fund provision is to provide for rehabilitation of the site by State nominated contractors should the applicant for any reason be unable to complete the rehabilitation activities or complete them insufficiently.

*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.

*Rehabilitation of vehicle maintenance yard and secured storage areas*

No vehicle maintenance yard or secure storage areas will be constructed.

*Rehabilitation of surface disturbance*

In determining the quantum, the following assumptions apply:

1. That 1 prospecting trenches require rehabilitation
2. That 1 bulk sample site require rehabilitation
3. That 3km tracks require rehabilitation.

The following calculation applies:

Prospecting Trench

Assume 1.5m deep pit 250long X 20m wide = 5000m<sup>2</sup> and 7500m<sup>3</sup>

Bulk sample Trench

Assume 1.5m deep 70m long X 70m wide = 5000m<sup>2</sup> and 7500m<sup>3</sup>

Rehabilitation at the excavations will consist of backfilling of infield screen material, overburden and top soiling of excavation and levelling of the site.

Backfilling	10 000 m <sup>3</sup> @ R 6.00 /m <sup>3</sup>	R60 000.00
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Spread topsoil	5 500 m <sup>2</sup> @ R 2.00 /m <sup>2</sup>	R11 000.00
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Roads and tracks

All tracks to be ripped with 2 groped scarifier

Ripped 3km	9000 m <sup>2</sup> @ R0.15 /m <sup>2</sup>	R 1 350.00
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Cost of rehabilitation:		R72 350.00
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*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
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Duration of rehabilitation:	1 day
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Equipment required:

Manual labor @ R500.00/day for clean-up	R 500.00
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Cost of rehabilitation:	R 500.00
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The applicant is willing to escalate the total estimated amount of R 72 850.00 that is needed for rehabilitation to R75 000.00 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 75 000.00 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 a second closure objective is to ensure that the rehabilitation and mitigating measures applied during operation prove successful. The only way to accomplish this is by regular monitoring. Monitoring on all the environmental issues as discussed in the EMPR will be carried out on a regular basis. This includes monitoring of waste washed in from outside, the re-vegetation process, erosion and the effect of windblown sand and/or dust. Any unforeseen impact or ineffective management measures that are identified during monitoring will be addressed as an addendum to the EMPR.

#### 5.2 Functional requirements for monitoring programmes

##### *Monitoring*

A second closure objective is to ensure that the rehabilitation and mitigating measures applied during operation prove successful. The only way to accomplish this is by regular monitoring. Monitoring on all the environmental issues as discussed in the EMPR will be carried out on a regular basis. This includes monitoring of waste washed in from outside, the re-vegetation process, erosion and the effect of windblown sand and/or dust. Any unforeseen impact or ineffective management measures that are identified during monitoring will be addressed as an addendum to the EMPR.

##### *Aftercare*

As the final phase in the project cycle, decommissioning may present positive environmental opportunities associated with the return of the land for alternative use and the cessation of impacts associated with operational activities. However, depending on the nature of the operational activity, the need to manage risks and potential residual impacts may remain well after operations have ceased. Examples of potential residual impacts and risks include contamination of soil and groundwater, stock that has been abandoned (e.g. oil drums, scrap equipment, old chemicals) and old (unserviceable) structures. The closure plan to be submitted at final closure will provide specific guidance with respect to the management of the environmental risks associated with the decommissioning stage of a project. Unauthorized entry will be taken very seriously during final closure and traffic onto the property will be kept to a minimum. Regular monitoring of the effectiveness of environmental management and mitigating measures implemented during the post mining decommissioning phase will continue until a closure certificate is awarded.

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

Internationally, there seem to be three schools of thought:

“What the affected community wants, the affected community gets” – that is, the key focus is on providing the end product requested by the affected communities, rather than focusing on the previous status quo of the receiving environment

“Restoration of previous land use capability” – the original thought process in the South African context, because mining often occurs on land with agricultural potential

“No net loss of biodiversity” – the focal point in the ICMM/IUCN dialogue sponsored guidelines for mining and biodiversity, and of many mining corporate policies.

The thought process for the closure of this area is based on the last two. The main closure objective therefore is to leave the site in as safe and self-sustaining a condition as possible and in a situation where no post-closure intervention is required.

The aim is to ensure that the affected environment is 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 aesthetic value of the area will also be reinstated.

To meet the objectives the management and mitigating measures described above needs to implemented, monitored and evaluated.

#### 6.2 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 listed below 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.

The only interested and affected party is deemed to be the surrounding community members as the landowner is also the applicant.

The Local Authority was notified by means of a registered. Other mining companies including De Beers and Carpe Diem Explorations (Pty) Ltd was notified by means of a registered letters and or meetings.

No Consultation with landowner as the land belongs to the applicant and all other interested parties were invited to commend on the proposed project by means of an advertisement in the local newspaper.



## 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.

The consultation report and a copy of the draft EMP were made available to all interested and affected parties.

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

The only interested and affected party is deemed to be the surrounding community members as the landowner is also the applicant.

The Local Authority was notified by means of a registered. Other mining companies including De Beers and Carpe Diem Explorations (Pty) Ltd was notified by means of a registered letters and or meetings.

No Consultation with landowner as the land belongs to the applicant and all other interested parties were invited to comment on the proposed project by means of an advertisement in the local newspaper.

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

No views or comment received

### 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

No views or comment received

### 7.2.5 Other concerns raised by the aforesaid parties

No views or comment received

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

The consultation report together with copies of the communication with interested and affected parties was uploaded on the SAMRAD system as part of this application.

### 7.2.7 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

## **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 ensure 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 ensure 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.

A budget of R40 000 per year was made available for compliance reporting including the updating of layout plans and performance assessment on the implementation of the EM Programme and update of quantum of financial provision. This amount will also be adequate for progressive rehabilitation of the mining operation. In addition to this amount for progressive rehabilitation a financial guarantee of R750 000 will be supplied to DMR for final rehabilitation and closure of the operation.

### 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>Andrew Jacob Hendricks</b>
<b>Identity Number</b>	<b>4907295078085</b>

**-END-**