mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: Nange Mineral Resources (Pty) Ltd

REFERENCE NUMBER: NC 30/5/1/2/2/10274 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.

ITEM	COMPANY CONTACT DETAILS
Name	Nange Mineral Resources (Pty) Ltd
Tel no	011 760 3737
Fax no:	011 760 3737
Cellular no	083 785 8688
E-mail address	mpfarisenim@nangeresources.co.za
Postal address	P.O Box 31499 Braamfontein, Johannesburg, South Africa 2017

ITEM	CONSULTANT CONTACT DETAILS (If applicable)
Name	N/A
Tel no	
Fax no:	
Cellular no	
E-mail address	
Postal address	

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.

The prospecting application area encompasses an area of 11 350.2652 Ha. The current land use of the application area is predominantly cultivation and grazing land.

A field visit was conducted on the 21th of January 2012 with the following objectives:

- Placement of site notices,
- Ground truthing of all desktop identified features and resources.
- Consultation with the IAP's.

Location

The application area is located about 130 Km's North-West of Kuruman Town in the Northern Cape Province and about 180 Km's North-West of Vryburg Town in the North-West Province.

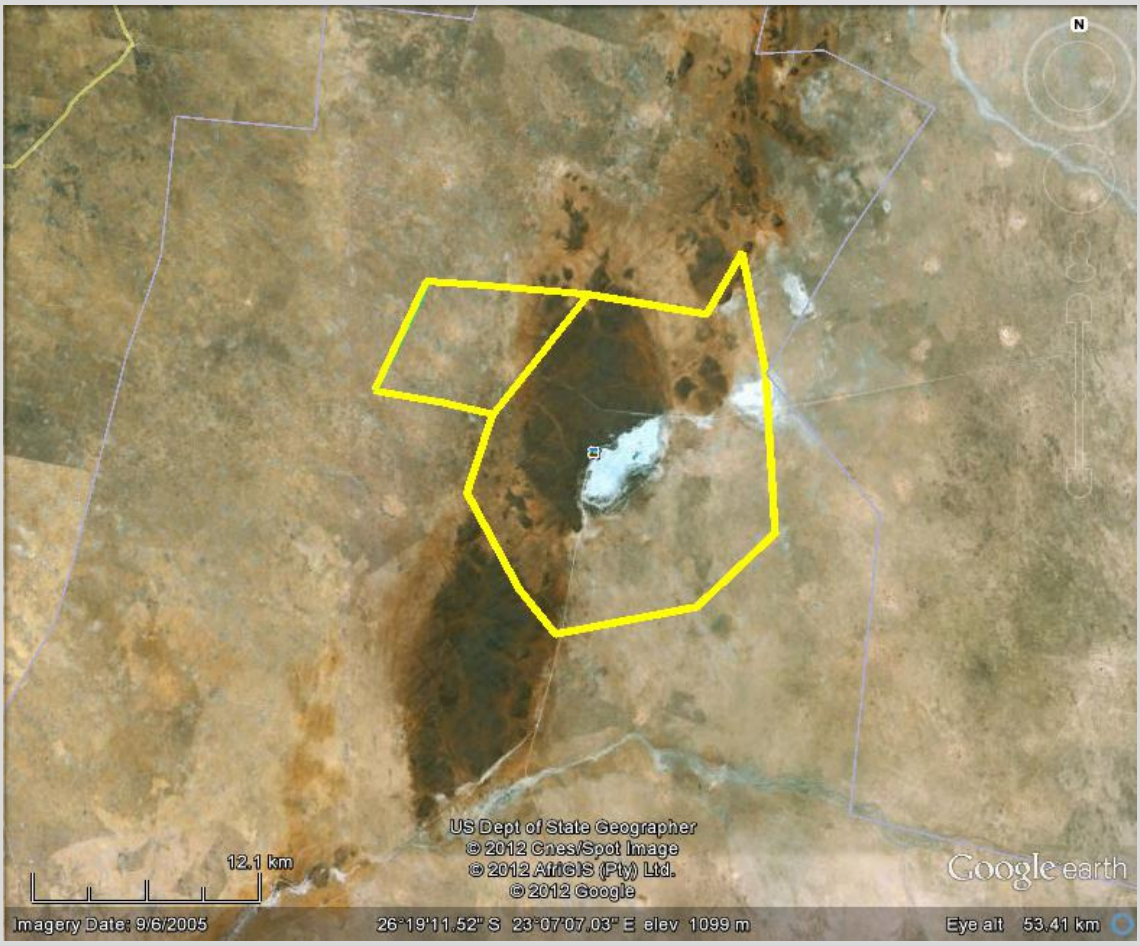


Figure 1.

Grazing land:

The area is primarily utilised for grazing of livestock. The carrying capacity of the area is very limited due to the extreme arid nature of the vegetation and climate. This creates a significant risk of irreversible damage to the area in the event of over grazing. Based on visual observations on the site there is no specific evidence that the land has been extensively over grazed. The livestock noticed at the area include cattle's, donkeys and Goats.

Salt Pans

There are two salt pans that are located within the application area, the one been at the centre and the other on the eastern side of the application site.

Existing infrastructure:

The proposed prospecting area is traversed by one main gravel road (in the centre section of the study area). Other private gravel tracks existing on the farms usually leading to and from the residential and/or the livestock collection and watering points. The various farms have been sub-divided into smaller grazing camps by the owners and are separated by means of low fences. These linear features may act as selective dispersal barriers to a variety of plant and animal species.

Figure 1: Gravel roads

In addition the pumping of water from the boreholes for livestock watering and domestic use (less concern) is likely to have a direct impact on the available groundwater resources.

1.1.3 Cultural

It is anticipated that the area will have graveyards due to the community who are living in this

area and provision has been made in this EMP to address this issue.

Figure 1. Typical view of the southern side of the study area.

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

Conservation aspects:

The application area is not located in or near any conservation area or environment. Special provisions has been made in the EMP to reduce any impacts, in potential conservation areas should they exist in the application area. Conservation land within the application area will be further identified as far possible, relying on local Authority and I&AP consultation to identify such landowners.

Topography:

The terrain classification is as follows:

- Level plains with some relief (primarily in the western and southern sections of the Sitecovering approximately 50% of the area);
- Level plains (a small section in the south western section of the site; <15% of the area);
- Rolling or irregular plains with some relief (primarily in the south central section of the site with a north south band in the north east section; approximately 30% of the area); and
- Plains with open low hills or ridges (along the southern edge of the area; <5% of the area).

Biodiversity:

The following animals are known to occur in the area:

Porcupine, Scrub Hares, Common Duiker, Steenbuck, Klipspringer, Bushpig, Warthog, Leopard, Jackal, Civet, Aardvark, Bushbabies and a range of common reptile and amphibian species.

Some red listed **species that occur include:**

Birds, with specific reference to Blue Crane (Anthropoides paradiseus), Lesser Kestrel (Falco naumanni) and African Grass Owl (Tyto Capensis) Reptiles, with specific reference to Python natalensis (South African Python).

The impacts of the development on the species mentioned should not be significant. Care should be taken to ensure that no animals are hurt or killed during the prospecting activities.

Vegetation and Soil

the site is characterised by the following soil types:

- Glenrosa and/or Mispah forms (other soils may occur), lime generally present in the Entire landscape;
- Red-yellow apedal, freely drained soils, red with a high base status;
- Red-yellow apedal, freely drained soils, red and yellow with a high base status and usually less than 15% clay content;
- Red-yellow apedal, freely drained soils, red with a high base status.

It is anticipated that the soils of the area are alluvial of origin and contains extensive

calcrete areas.

No evidence of significant erosion was noted and according to the available information from the Water Research Commission (2008) the site has an erodibility index value of between 10 and 12 (medium).

Highveld Alluvial Vegetation and Grassland;

The prospecting area includes the following vegetation units (location and description provided by Mucina and Rutherford; 20061):

• Bushmanland Arid Grassland (NKb3):
Slightly irregular plains with dwarf shrubland dominated by a mixture of low sturdy and spiny (sometimes also succulent) shrubs (Rhigozium, Salsola, Pentzia, Eriocephalus), 'white' grasses (Stipagrostis) and in the years of high rainfall also abundant annuals such as species of Gazania and Leysera.

Mucina and Rutherford (2006) provide comprehensive species lists for this vegetation unit. The key species are extracted and listed below:

- Dominant species and important taxa:
  - Graminoids: Aristida adscensionis, Aristida congesta, Enneapogon desvauxii, Eragrostis nindensis, Schmidtia kalahariensis, Stipagrostis ciliate and tipagrostis obtusa;
  - Small trees: Acacia mellifera subsp detiens, and Boscia foetida subsp foetida;
  - Tall shrubs: Lycium cinereum, and Rhigozium trichotomum;
  - Low shrubs: Aptosimum spinescens, Hermannia spinosa, Pentzia spinescens; Succulent shrubs: Kleinia longiflora, Lycium bosciifolium, Salsola tuberculata, Salsola Glabrescens;
  - Herbs: Acanthopsis hoffmannseggiana, Aizoon canariense, Amaranthus praetermissus, Barleria lichtensteiniana, Chamaesyce inaequilatera, Dicoma capensis, Indigastrum argyraeum, Lotononis platycarpa, Sesamum capense, Tribulus pterophorus, Tribulus terrestris, Vahlia capensis;
  - Succulent herbs: Gisekia pharnacioides, Psilocaulon coriarium, Trianthema parvifolia; and
  - Geophytic herb: Moraea venenata.
- Biogeographically important taxon: Tridentea dwequensis (a bushmanland endemic succulent herb).
- Endemic taxa:
  - Succulent shrubs: Dinteranthus pole-evansii, Larryleachia dinteri,Larryleachia marlothii, Ruschia kenhardtensis; and
  - Herbs: Lotononis oligocephala, Nemesia maxii.
- Conservation Status: The Bushmanland Arid Grassland is classified as least threatened and very little of the area has been transformed.

• Bushmanland Basin Shrubland (NKb6):

Slightly irregular plains with dwarf shrubland dominated by a mixture of low sturdy and spiny (sometimes succulent) shrubs (Rhigozium, Salsola, Pentzia, Eriocephalus), 'white' grasses (Stipagrostis) and in the years of high rainfall also abundant annuals such as species of Gazania and Leysera.

Mucina and Rutherford (2006) provide comprehensive species lists for this vegetation unit. The key species are extracted and listed below:

- Dominant species and important taxa:
  - Graminoids: Aristida adscensionis, Enneapogon desvauxii, Stipagrostis ciliate and Stipagrostis obtusa;
  - Tall shrubs: Lycium cinereum, and Rhigozium trichotomum;
  - Low shrubs: Aptosimum spinescens, Hermannia spinosa, Pentzia spinescens, Zygophyllum microphyllum;
  - Succulent shrubs: Salsola tuberculata;
  - Shrub: Thesium hystrix;
  - Succulent herbs: Mesembryanthemum crystallinum, Mesembryanthemum stenandrum, Trianthema parvifolia, Zygophyllum simplex; and
  - Herbs: Gazania lichtensteiniana, Lysera tenella.

- Biogeographically important taxon: Tridentea dwequensis (a bushmanland endemic succulent herb).

- Endemic taxa:
  - Herbs: Cromidon minutum;
  - Geophytic herbs: Ornithogalum bicornutum, Ornithogalum ovatum subsp oliverorum.

- Conservation Status: The Bushmanland Basin Shrubland is classified as least threatened and very little of the area has been transformed. Threats to this unit include moderate erosion and scattered invasions of Prosopis sp.

The bushmanland basis forms an environment for a number of endorheic pans (vloere) and extensive systems of intermittent river channels. In comparison to the bordering bushmanland arid grassland, the vegetation of this unit shows increased presence of shrubs and plant indicators of high salt status of the soil.

• <u>Bushmanland Vloere:</u>

A very small area in the prospecting site is designated as Bushmanland Vloere. Features of this unit include flat and even surfaces of pans and broad bottoms of intermittent rivers. The centre of the pan is usually devoid of vegetation; loosely patterned scrub dominated by Rhigozium trichotomum and various species of Salsola and Lycium, with a mixture of non-succulent dwarf shrubs of nama karoo relationship. In places loose thickets of Parkinsonia africana, Lebeckia linearifolia and Acacia karroo can be found.

Mucina and Rutherford (2006) provide comprehensive species lists for this vegetation unit. The key species are extracted and listed below:

- Dominant species and important taxa:
  - Tall shrubs: Parkinsonia africana, Xerocladia viridiramis;
  - Low shrubs: Rhigozium trichotomum;
  - Succulent shrubs: Salsola apylla, Salsola gladrescens; Salsola rabieana;
  - Herbs: Amaranthus dinteri subsp dinteri Lotononis minima;

- Geophytic herbs: Crinum variabile;
- Graminoides: Stipagrostis ciliate, Stipagrostis obtuse, Sporobolus nervosus, Stipagrostis namaquensis.
-

❖ Conservation Status: The Bushmanland Vloere is classified as Least Threatened. About 2% is transformed for cultivation or building of dams. Alien vegetation Prosopis sp occurs as scattered in some vloere and dry river beds. Several of the pans in this unit are mined for salt.

Red data Species

The available South African National Biodiversity Institute (SANBI) databases were consulted for the recorded red data species recorded for the quarter degree square/s in which the prospecting site is located (Appendix B). Of the species formally recorded in the greater region 30 species had a threatened status rating. Of these the majority had a 'Least Concern'2 rating. No species of Endangered, Vulnerable or Threatened species were listed for the applicable quarter degree/s.

On-site Observations

The vegetation encountered on the site confirms largely with the vegetation unit descriptions provided by Mucina and Rutherford (2006). The following specific species were identified:

- Rhigozium trichotomum;
- Stipagrostis obtuse (small bushman grass);
- Stipagrostis ciliate (tall bushman grass);
- Acacia mellifera; and
- Other unidentified species (a specialist vegetation survey was not conducted).

Based on consultation with the landowners and on-site observations it is expected that the vegetation of this area is extremely sensitive to physical disturbance and does not readily rehabilitate. In addition the existing vegetation provides great value to the landowners as a livestock food source.

Due to the size of the prospecting area and the fact that no specific locations for disturbance have yet been identified it is impossible to ascertain the presence or likely disturbance of any of red data species and or ecosystems. The following recommendations apply:

- Vehicular movements must, as far as possible be restricted to the existing roads and two-spoor tracks, so as to prevent unnecessary damage to existing vegetation;
- The sitting of any prospecting equipment or activities must where reasonably possible avoid or at least minimise the physical disturbance to existing vegetation (specifically shrubs and stands of Stipagrostis obtusa- very palatable and important grazing grass species);
- No medium to large shrubs must be disturbed.
- Location of site of physical disturbance must be identified in consultation with the Affected landowner.
- Care must be taken during the rehabilitation to ensure that no alien invasive species Have established (specifically Prosopis sp).

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

Relevant Maps have been attached

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

To date, no I&AP has contested the description of the environment as provided in this document.

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 Description of the proposed prospecting right operation.

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

Prospecting work will be conducted to identify potential Iron ore and Manganese is thought to be preserved. A number of boreholes will be drilled to expose the profile for logging and sampling.

Should the complete prospecting program be successful, the company aims to conduct scoping, followed by feasibility studies during the final 2 years of the licence period to determine the viability of a mining operation and for planning purposes prior to applying for a mining authorisation.

For iron ore and manganese reserve determinations, trenching and pitting are undertaken to establish the deposit depth and to obtain samples, if any outcropping has been identified.

At least one pit will be dug (2 x 2m). At least one pit will dug to assess the soil profile and thickness, of which the location has not yet been identified. The location of the pit will be determined once the locations of the boreholes have been determined, subsequent to phase 1 as described above. The pit is not expected to be more than 1m deep.

Geochemical survey: No geochemical will be done.

Geophysical survey: No geophysical surveys are anticipated

No access roads will be constructed, the area is well traversed by public and private roads and thus existing roads and track will be utilised. No new access tracks will be created unless required and if required will be done with permission from the land owners and the EMP updated. Existing roads will be utilised as far as possible.

Please refer to the Prospecting works programme for more detail.

Water required for the operation includes:

- Domestic drinking water;
- Water for drilling.
- Water for chemical toilets

All water will be obtained from a legal authorised water source (existing water use licenses from surrounding landowners, municipal supplies). Water will be stored in temporary storage facilities on site (e.g. small water tanks).

In the unlikely event that water is abstracted from any water resource, this will be in accordance with the relevant legal provisions (e.g. National Water Act Section 21 water use provisions). Any abstraction will be undertaken within the parameters of any relevant existing abstraction permit/license requirements or legal thresholds. The use of local water sources, as well as compensation for water abstracted, must be negotiated and agreed with the relevant landowners prior to abstraction.

2.2 Plan of the main activities with dimensions

The Plan has been included in Appendix C.

2.3 Description of construction, operational, and decommissioning phases.

Phases and activities:

The first phase will entail desktop survey and no physical drilling or excavating will take place. A total of 5 new holes will be created to identify iron and Manganese ore during the second phase.

A typical drill rig setup would not occupy an area greater than 20mx20m. Additional other activities that will take place during the 3rd phase include:

- Mineral resource and reserve estimations in line with industry requirements;
- Preliminary rock mechanics and geohydrological studies;
- Conceptual mine planning;
- Processing test work on bulk samples;
- Preliminary economic analyses;

- Pre-feasibility Study;
- Socio-economic impact assessments;
- Permitting and authorisations.

Depending on the quality of the deposits, sampling and testing may be necessary during the 3rd phase to test crushing and processing parameters. This will entail excavation of a few small test pits. Should the prospecting work programme require amendment for the inclusion of additional prospecting techniques, a Section 102 Application will be submitted to the DMR for approval prior to the prospecting work programme and EMP being updated.

Typical prospecting equipment will include:

- Hand held augers for soil sampling,
- Seismic survey equipment,
- Borehole drilling rigs (anticipated to be a maximum of 1 drilling rigs at any one time). Drilling will involve diamond drilling with mud and casing to support holes in clay, where necessary.
- Ancillary equipment included the limited the use of camp structures, portable ablution facilities, generators, settlement ponds/sump, if necessary, drilling materials as grouts, etc.)

Secondary activities:

No food preparation will be done on-site, and no wood collection allowed. This will eliminate the desire for wood collection and hunting, will reduce the quantity of waste to be generated, and will reduce the risk of fire, attraction of vermin and development of untidy conditions

Water will be required for the prospecting drilling operations and ancillary activities. It is unlikely that more than 10 000 litres will be required per day for drilling purposes.

Chemical toilets will be hired and maintained/serviced by a registered service provider, in accordance with the requirements of the municipality, Occupational Health and Safety Act and other appropriate legislation. Such toilets will be kept neat and clean/hygienic. Waste will be regularly removed, while care will be taken to prevent any spillages of sewage, and disposed of in a legal manner. No disposal of sewage will take place directly into the environment.

Working hours will be limited to normal working hours, i.e. from 8:00 to 17:00 during weekdays and 8:00 to 14:00 on Saturdays. Where possible work on Saturdays will be avoided, especially near potential noise sensitive areas. However, if unavoidable, affected landowners and occupants will be negotiated with to minimise any disturbance. No prospecting activities will take place on Sundays and public holidays. Working hours will be defined based on consultation with the effected landowner.

Necessary precautions should be taken on the sites to reduce the risk of uncontrolled fires. These should include:

- No open fires will be allowed on-site and no worker will be allowed to discard cigarettes or cigarette butts (or any other waste) into the environment;
- Fire extinguishers will be kept at all drilling sites and on all vehicles; and

The proposed prospecting areas will be regarded as a no-smoking zone by all workers.

Noise will be generated by the prospecting activities. Noise sources may include:

- Vehicular movements to and from the sites as well as activities on each specific site.
- Operation of the drilling equipment (and other prospecting equipment e.g. seismic equipment);
- Noise is likely to be generated by low flying aircraft during geophysical surveying; and
- Operation of generators. It is not anticipated that the noise generated form the prospecting will present a significant detrimental impact based on the following :
- The area has a low residential / population density and therefore there are very few noise receptors;
- The prospecting activities are of relatively short duration;

Waste which may be generated by the prospecting activity include the following:

- Removed topsoil and subsoil's (not wastes)
- Excess rock cores and cuttings from the drilling process;
- Settled sediments and materials from wet drilling;
- Used plastic linings from the drilling process;
- Contaminated water (contaminated with drilling fluids, or any other hazardous substance); and
- General domestic waste and litter.

Removed soils and overburden will be collected and stored in a designated area (as close as practically possible to the drill point). Where necessary the materials will be used for rehabilitation of the site. All topsoil will be stored separately and away from actual drilling activity. Stored topsoil will also be located outside of areas prone to erosion.

General solid wastes will be collected and stored on site in closed, secure (scavenger proof) storage containers. The content of these containers will be disposed of at a suitably licensed

facility on a regular basis (at least once a week). The quantities of waste to be generated will be too small to justify on-site separation of different waste streams for recycling (volumes too low to be viable).

After prospecting related disturbances cease, the disturbed area will be reinstated. If subsoil was removed the subsoil will be placed back first. Before topsoil is spread, the compacted area will be deep-ripped to a depth of at least 30 cm where soil depth permits. The access tracks and other areas where significant compaction has occurred must be deep ripped to allow for re-establishment of vegetation. All directly disturbed areas must be seeded with an applicable grass mixture.

2.4 Listed activities (in terms of the NEMA EIA regulations)

NEMA Listing	Description
Regulations 545 Activity 19	Any activity which requires a prospecting right or renewal thereof in terms of section 16 and 18 respectively of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

2.5 Identification of potential impacts

2.6 Potential impacts per activity and listed activities.

The following impacts have been identified and addressed in this EMP.

<u>They are described in more detail in each of the impact boxes under section 3.1.2:</u>

Phase 1: Exploration desktop planning:

Non-Invasive Activities:

Acquisition of all geological information available and integration into an electronic database

Satellite and photo geological and interpretation of the area;

Geological mapping;

Identification of targets.

Impacts from phase 1:

- No impacts will be created.

Phase 2:

Non-Invasive Activities:

Airborne magnetic, radiometric and EM surveys as appropriate;

Modelling and interpretation of data and identification of targets;

Planning of follow up work.

Regional percussion and diamond drilling for target identification (70,000m in total).

Impacts from Drilling:

- Vegetation loss through clearing for drill rig, creation of sumps and space for chemical toilet
- Loss of Biodiversity as a results of vegetation clearance and noise disturbance
- Impact on livestock and farming activities as a results of noise and visual disturbance
- Impact on sensitive vegetation and biodiversity area as a results of actual drilling and site prep
- Impact on water resources from spilled oils and lubricants
- Impacts of access tracks from increase in number of vehicles
- Safety Risk to land owners
- Impact on existing residential areas and structures (Mine OSHA)
- Impact of dust (nuisance)
- Fire hazards created during prospecting activities
- Sense of place
- Waste collection and disposal
- Impacts on identified and / or un-identified historic and cultural features.
- Impact on land use
- Soil pollution, soil conservation and erosion control

Phase 3:

Environmental impact assessment;

Conceptual prospecting planning

Follow up percussion and diamond drilling for target definition (2,000m).

Continued drilling for target definition and evaluation (~10 000m minimum).

Impacts from further drilling)

- Vegetation loss through clearing
- Loss of Biodiversity
- Impact on livestock and farming activities
- Impact on sensitive vegetation and biodiversity area
- Impact on water resources
- Impacts of access tracks.
- Safety Risk to land owners
- Impact on existing residential areas and structures (Mine OSHA)
- Impact of dust (nuisance)
- Fire hazards created during prospecting activities
- Sense of place
- Waste collection and disposal
- Impacts on identified and / or un-identified historic and cultural features.
- Impact on land use
- Soil pollution, soil conservation and erosion control

2.7 Potential impacts on communities, individuals or competing land uses in close proximity.

The proposed prospecting activities may impede land use or prevent the use of such land for an average period of one month. This impact is largely mitigated due to the temporary nature of the prospecting and the small footprint required for the drilling sites (20m x 20m)

2.8 Potential impact on heritage resources

Prospecting activities have the potential to impact on known or unknown cultural heritage resources during the duration of the process. It is recommended that the identification of proposed prospecting drill sites be determined in consultation with the affected landowner/s once the preliminary investigations area complete and the target areas have been identified. No prospecting activities will be undertaken within 50m of a physical structure (including residential dwellings) or graveyard, or power line.

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

The one-on-one, notification letters and facsimiles sent to all IAP's requested that they comment on impacts and suggest any that they believe the receiving environment will experience. I&AP concerns and identification of impacts has not been received by know.

2.10 Confirmation of specialist report appended.

No initial specialist input is recommended, due to the uncertain location of prospecting drill sites. Where non-disturbed/sensitive areas may be affected, a site specific EMP will be undertaken, which would fulfil the need for specialist reports.

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

They are described in more detail in each of the impact boxes under section 3.2:

3.2 Criteria of assigning significance to potential impacts

Method of Assessing Impacts

The impact assessment methodology is guided by the requirements of the NEMA EIA Regulations (2010). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. This determines the environmental risk.

In addition other factors, including cumulative impacts, public concern, and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S).

Determination of Environmental Risk:

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER).

The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and reversibility (R) applicable to the specific impact.

For the purpose of this methodology the Consequence(C) of the impact is represented by:

$$C = \frac{(E+D+M+R)}{4} \times N$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 1:

Table 1: Criteria for determination of impact consequence.

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years),
	3	Medium term (6-15 years),
	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (no mitigation measure of natural process will reduce the impact after construction).
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected),

	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected),
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way),
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease), or
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease).
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact

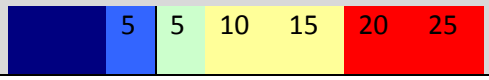
Once the Consequence(C) has been determined the Environmental Risk (ER) is determined in accordance with the standard risk assessment relationship by multiplying the Consequence and the Probability (refer to Figure). Probability is rated/scored as per Table 2.

Table 2: Probability scoring.

Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur),

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows:

ER= C x P



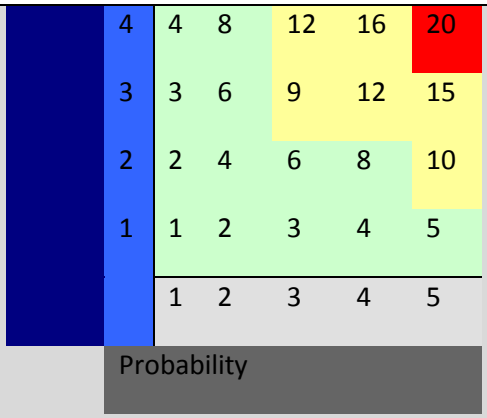


Figure 13: Determination of environmental risk.

The outcome of the environmental Risk Assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 3.

Table 3: Significance classes.

Environmental Risk Score	
Value	**Description**
< 9	Low (i.e. where this impact is unlikely to be a significant environmental risk),
≥9; <17	Medium (i.e. where the impact could have a significant environmental risk),
≥ 17	High (i.e. where the impact will have a significant environmental risk).

Factor	Score	Description
Public response (PR)	Low (1)	Issue/ imPact raised in < 30% of responses.
	Medium (2)	Issue/ impact raised in >30% and < 60% of responses.
	High (3)	Issue/ impact raised in >60% of responses.
Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable loss of resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/ mitigated.

Impact Prioritisation

In accordance with the requirements of Regulation 31 (2)(l) of the EIA Regulations (GNR 543), and further to the assessment criteria presented in Section 0 it is necessary to assess each potentially significant impact in terms of:

- Cumulative impacts; and
- The degree to which the impact may cause irreplaceable loss of resources.

In addition it is important that the public opinion and sentiment regarding a prospective development and consequent potential impacts is considered in the decision making process.

In an effort to ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority / significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/ mitigation impacts are implemented.

Table 4: Criteria for the determination of prioritisation.

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 4. The impact priority is therefore determined as follows:

Priority = PR + CI + LR

The result is a priority score which ranges from 3 to 9 and a consequent PF ranging from 1 to 2 (refer to Table 5).

Table 5: Determination of prioritisation factor.

Priority	**Ranking**	**Prioritisation Factor**
= 3	Low	1
3 – 9	Medium	1.5
= 9	High	2

In order to determine the final impact significance the PF is multiplied by the ER of the post mitigation scoring. The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration.

The ultimate aim of the PF is to be able to increase the post mitigation environmental risk rating by a full ranking class, if all the priority attributes are high (i.e. if an impact comes out with a medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential, significant public response, and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Environmental Significance Rating	
Value	**Description**
< 9	Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
≥9; <17	Medium (i.e. where he impact could influence the decision o develop in the area),

≥ 17	High (i.e. where the impact must have an influence on the decision process to develop in the area).	

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

Impact name:	*Vegetation loss through clearing for drilling*				
Alternative:	*N/A*				
Description of impact:	*The prospecting activities have the potential to result in direct loss of vegetation, spread and establishment of weed species and impacts on fauna (restricted to the drill/investigation areas and associated access tracks, if any).*				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	2	1
Extent of Impact	1	1	Reversibility of Impact	2	2
Duration of Impact	2	2	Probability	4	4
Environmental Risk (Pre-mitigation)					**-7**
Environmental Risk (Post-mitigation)					**-6**
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
N/A					
Cumulative Impacts					2
Spread of alien vegetation will accumulate and degrade natural grassland areas					
Degree of potential irreplaceable loss of resources					1
No irreplaceable resources should be affected, site specific EMP will be conducted when entering sensitive areas, such as river buffer areas, drainage areas, undisturbed natural grasslands etc.					

Prioritisation Factor	1.5
Mitigation Measures	
• Vehicular movements must, as far as possible be restricted to the existing roads and two-spoor tracks, so as to prevent unnecessary damage to existing vegetation; • The footprint of disturbance must be kept as small as possible, and must be rehabilitated as soon as possible. • The sitting of any prospecting equipment or activities must where reasonably possible avoid or at least minimise the physical disturbance to existing vegetation; • Should the site be located in an undisturbed, or conservation area, a pre-commencement survey of the identified site must be undertaken by a suitably qualified professional to ensure that no red data or protected flora or fauna will be directly impacted upon; • No medium to large shrubs must be disturbed where possible; • No protected species may be disturbed (of specific note is the high density of Marula trees- a permit is required if these need to be disturbed); • Location of site of physical disturbance must be identified in consultation with the affected landowner; • Care must be taken during the rehabilitation to ensure that no alien invasive species have or do establish (specifically Cereus jamacaru, Lantana camara, Melia azedarach, Opuntia ficus-indica and Sesbania punicea). • Alien invasive plants should be removed from all disturbed and subsequently rehabilitate areas. • Worker's boots and clothing, vehicles, drilling equipment and other plant/machinery/tools should be cleaned from mud, dust and other possible sources of seed/propagules before moving to the next drilling site, in order to prevent the spread of alien invasive plant species.	
Final Significance	**-9**

Impact name:	*Loss of Biodiversity from drilling*
Alternative:	*N/A*
Description of impact:	*There is a risk that prospecting staff may disturb the existing wildlife / flora and fauna (e.g. hunting and collection of firewood or medicinal plants), domestic/farm animals and crops or orchards*

Environmental Risk

Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	2	1
Extent of Impact	1	1	Reversibility of Impact	2	2

Duration of Impact	2	2	Probability	4	4
Environmental Risk (Pre-mitigation)					**-7**
Environmental Risk (Post-mitigation)					**-6**
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
N/A					
Cumulative Impacts					2
Degradation and loss of biodiversity would accumulate if not mitigated.					
Degree of potential irreplaceable loss of resources					1
No irreplaceable resources should be affected					
Prioritisation Factor					1.5
Mitigation Measures					
• Landowners must be consulted prior to commencement of prospecting activities to identify potentially sensitive and/or dangerous species present on site. Applicable preventative and protective measure must be agreed and implemented. • No fauna must be purposefully killed during the prospecting activities including endemic fauna and livestock. • No worker may disturb, hunt, set traps/snares, utilise dead or alive fauna/livestock/wildlife/fish, collect or remove firewood or medicinal plants or other plants/crops/fruit. • Where reasonably possible direct impacts on small fauna (e.g. invertebrates, reptiles) must be prevented. • The siting of any prospecting equipment or activities must where reasonably possible avoid or at least minimise the physical disturbance to existing faunal residents (e.g. burrows, nests, etc); • Should the site be located in an undisturbed, or conservation area, a pre-commencement survey of the identified site must be undertaken by a suitably qualified professional to ensure that no red data or protected flora or fauna will be directly impacted upon; • Where possible fauna which cannot be avoided should where reasonably possible, be relocated out of the demarcated prospecting area prior to commencement. • Road users must be aware of small fauna crossing the access roads and killing of these fauna must be avoided. • Site supervisors must ensure that the staffs remain within the demarcated prospecting areas at all times; • Disciplinary action must be taken in the event that any flora or fauna is wilfully disturbed or killed.					
Final Significance					**-9**

Impact name:	*Impact on livestock and farming activities from drilling*
Alternative:	*N/A*
Description of impact:	*The area is utilised for livestock farming and as such direct impacts on the livestock and farming practices must be prevented.*

Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	2	1
Extent of Impact	1	1	Reversibility of Impact	2	2
Duration of Impact	2	2	Probability	4	4
Environmental Risk (Pre-mitigation)					**-7**
Environmental Risk (Post-mitigation)					**-6**
Degree of confidence in impact prediction:					Medium

Impact Prioritisation	
Public Response	1
N/A	
Cumulative Impacts	2
Disruption of land use practices may accumulate amongst the many different sites	
Degree of potential irreplaceable loss of resources	1
No irreplaceable resources should be affected, site specific EMP will be conducted when entering sensitive areas, such as river buffer areas, drainage areas, undisturbed natural grasslands etc.	
Prioritisation Factor	1.5
Mitigation Measures	

• The prospecting plan must be provided to the landowner and where possible scheduled to align with the livestock camp rotations (i.e. prevent drilling in camps where livestock are being grazed). • Prospecting employees must be informed of the sensitivity of the livestock and wildlife and may not disturb or kill any livestock. In areas designated as grazing area, the drill site must be fenced off or cordoned off to prevent livestock from wandering into the area. • In the event of livestock damage compensation must be negotiated with the applicable landowner/ lawful occupier.	
Final Significance	**-9**

Impact name:	*Impact on sensitive vegetation and biodiversity areas from drilling*				
Alternative:	*N/A*				
Description of impact:	*Impact on natural areas could occur during prospecting through land clearing for access roads and drilling sites*				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	4	3
Extent of Impact	1	1	Reversibility of Impact	2	2
Duration of Impact	2	2	Probability	4	2
Environmental Risk (Pre-mitigation)					**-9**
Environmental Risk (Post-mitigation)					**-4**
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
N/A					
Cumulative Impacts					2
Loss or damage to sensitive area would accumulate on different sites					
Degree of potential irreplaceable loss of resources					2
No irreplaceable resources should be affected, site specific EMP will be conducted when entering sensitive areas, such as river buffer areas, drainage areas, undisturbed natural grasslands etc.					
Prioritisation Factor					1.5
Mitigation Measures					

• Where possible prospecting activities should not take place within formal and informal conservation areas, National Protected Areas Expansion Strategy areas, or undisturbed grassland areas. • In the event that prospecting activities do occur in conservation areas or areas not altered by cultivation, a specialist pre-commencement survey should be undertaken of the identified sites to ensure that all reasonable measures are taken to prevent irreversible damage to the receiving ecosystems. • In the event that prospecting activities do take place in these areas, a suitable qualified specialist must design a suitable site specific rehabilitation plan to ensure that the disturbed area is rehabilitated to the pre-commencement condition. In addition, the boreholes must be completely rehabilitated and concrete collars must be removed.	
Final Significance	**-6**

Impact name:	*Impact on water resources from drilling*
Alternative:	*N/A*
Description of impact:	*Water use and impact on water resources. Water is a scarce resource and careful consideration must be given to the sustainable use of water during drilling operations.*

Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	4	4
Extent of Impact	3	3	Reversibility of Impact	2	2
Duration of Impact	2	2	Probability	4	2
Environmental Risk (Pre-mitigation)					**-11**
Environmental Risk (Post-mitigation)					**-5.5**
Degree of confidence in impact prediction:					Medium

Impact Prioritisation	
Public Response	1
N/A	
Cumulative Impacts	1
Loss or damage to water resources would accumulate in from different sites	
Degree of potential irreplaceable loss of resources	2
Pollution by prospecting would affect irreplaceable fresh water in natural systems	
Prioritisation Factor	1.5
Mitigation Measures	

• Water for drilling and other uses must be obtained from existing approved/licensed sources. This may include landowner's boreholes (licensed abstraction). Any abstraction will be undertaken within the parameters of any relevant abstraction permit/license requirements. The use of local water sources (e.g. from boreholes) must be negotiated and agreed with the relevant landowners/community leaders or DWA prior to use. • If no viable water resources could be identified or negotiated with landowners, water should be sourced from a recognised water service provider, i.e. the municipality. • Water used in the drilling process must, where possible, be contained in a closed system and re-used/recycled. • No prospecting activities to be undertaken under or within the 1:50 year flood line or within 100m form a water resource (incl. wetland, river, or dam). • No hazardous substances are to be utilised in the drilling process – pollution of the aquifer is to be prevented at all costs. • During decommissioning, all boreholes which will not be required for later monitoring or other useful purpose should be grouted to prevent possible flow between aquifers. • In the event that landowners request to retention and use of the boreholes, the Department of Water Affairs must be consulted with regards to the necessary legal requirements (e.g. water use licences and/or borehole registration).	
Final Significance	**-8.25**

Impact name:	*Impacts of access tracks from drilling*
Alternative:	*N/A*
Description of impact:	*The creation of new access roads and track could negatively affect soil erosion, vegetation clearing and landowner security.*

Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	4	2
Extent of Impact	1	1	Reversibility of Impact	1	1
Duration of Impact	2	2	Probability	4	2
Environmental Risk (Pre-mitigation)					**-8**
Environmental Risk (Post-mitigation)					**-3**
Degree of confidence in impact prediction:					Medium

Impact Prioritisation	
Public Response	1
N/A	
Cumulative Impacts	2
This impact can accumulate if more than one site is negatively affected.	
Degree of potential irreplaceable loss of resources	2
Unintended loos of irreplaceable resources may occur through land clearing	
Prioritisation Factor	1.5
Mitigation Measures	

• Existing roads and tracks will be utilised wherever possible. Use of existing and new roads/tracks should be avoided if possible during and after rains to prevent unnecessary road/track surface damage, compaction or silt pollution. • The use of the existing access roads, and the alignment of new access tracks if needed, should be planned in consultation with the landowners. • New access tracks should be planned and aligned to avoid sensitive areas such as ecologically sensitive areas (steep topography, wetlands, rivers, heritage sites and drainage lines. • New access tracks should be provided with erosion and silt pollution prevention measures. • New access tracks should be rehabilitated as soon as possible after prospecting activities are complete (except if retention of new access tracks is requested by the landowner, and such an agreement is approved by DMR). • Consultation with the landowner and Provincial Department must take place prior to the creation or use of any new access roads or tracks. Where no option exists but to erect new access tracks that are wider than 4m or have a road reserve wider than 6m, and are longer than 30m, then the Provincial Department of must be consulted and the necessary NEMA Environmental Authorisation obtained prior to commencement. • In the event that new access tracks are required a suitable specialist must be appointed to conduct a pre-commencement survey to ensure that no red data or protected flora or fauna will be directly impacted upon.	
Final Significance	**-4.5**

Impact name:	*Safety Risk to land owners from drilling*				
Alternative:	*N/A*				
Description of impact:	*Health and safety risks to landowners, occupants and visitors may result if prospecting operation drilling risks are not properly managed.*				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	5	5
Extent of Impact	1	1	Reversibility of Impact	4	4
Duration of Impact	2	2	Probability	4	2
Environmental Risk (Pre-mitigation)					**-12**
Environmental Risk (Post-mitigation)					**-6**
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
N/A					
Cumulative Impacts					2
This impact can accumulate if more than one site is negatively affected.					
Degree of potential irreplaceable loss of resources					3
Water or cultural resources may be affected, which may not be easily replaceable in function					
Prioritisation Factor					1.5
Mitigation Measures					

• Landowners should be notified prior to accessing their land. A date and time that is suitable to the landowner as well as reasonable to the applicant should be negotiated. The number and identity of workers, the purpose of the visit and specific areas to be visited, should be provided in the notification;
• Acess routes should be planned in consultation with relevant landowners. Areas to be disturbed or cleared (for access and drill sites) should be communicated to the landowner prior to clearing.
• Workers should be easily identifiable by clothing and ID badges (with clear ID photographs). Workers should carry with them at all times a letter from the applicant/employer, stating their identity, role/task description, and landline number which the landowner may phone to confirm ID and other information given by the worker;
• For each property at any point in time, group size of workers should be kept to a minimum and should not exceed 6 (preferably not more than 3 if and when possible);
• Labourers and contract workers (if any) should be accompanied by a responsible supervisor at all times;
• Workers should be provided with proper HIV/AIDS training and made aware on human rights, especially sexual rights of women, landowner and lawful occupier rights and other relevant legislation;
• Workers may not receive any visitors while they are within the prospecting area;
• No worker will be allowed to sleep or overnight within the proposed prospecting area, except if a formal booking were made with an established accommodation establishment;
• Workers will not be allowed to keep or use alcohol, recreational drugs, traditional or modern weapons, snares or otherwise dangerous objects on-site, or to enter the prospecting area while on the influence of alcohol or drugs;

• Workers will not be allowed to keep (or have in their possession at any point in time) any animals, including livestock, poultry, wildlife or pets;
• Although field workers conducting initial geological surveys will be allowed to cover large and unpredictable tracts of land (in principle the entire prospecting area), drilling workers should be restricted to access roads/tracks and drilling sites, and will not be allowed to wander off into the rest of the property or surrounding land;
• Disturbance should be limited to the minimum and agreed upon footprint, and no vehicle turning, parking or access, or other form of disturbance e.g. vegetation clearance, soil compaction or excavation will be allowed outside these areas;
• All access gates should be kept closed if desired by the landowner;
• All piped, lines and other utility infrastructure and servitudes should be identified prior to drilling;
• Any damage to public or private property, including roads, stormwater systems, fences, gates, buildings and other structures, pipes, lines and other utilities or infrastructure and movable properties, should be repaired, replaced or otherwise compensated for as agreed with the affected person;
• If preliminary geological investigations reveal the possibility to encounter gas, the drill rig should be provided with necessary hazard protection systems (e.g. a gas blowout prevention system; or Washington well head);

• In case a borehole encounters flammable, explosive or toxic gas (including natural gas), the DMR and other relevant authorities should be notified, and the borehole should be sealed to prevent gas escape;
• During decommissioning, all boreholes should be grout filled to prevent possible interflow between aquifers or surface water ingress. However, in case the applicant wish to retain any boreholes (for later monitoring or other useful purpose), permission should be obtained from DMR, Department of Water Affairs, and the landowner.
• A complaints register should be maintained to log complaints by landowners, occupants and other Interested and Affected Parties, and response to such complaints. The complaints register should be provided to DMR on an annual basis and at any point in time if requested by the DMR.

• Relevant farm access protocols must be complied with e.g. standard protocol provided by the relevant Agricultural Union (AU).	
Final Significance	**-9**

Impact name:	*Impact on existing residential areas and structures(Mine OSHA) from drilling*
Alternative:	*N/A*
Description of impact:	*Existing structures located on private lands could be damaged or affected in other ways by prospecting*

Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	5	5
Extent of Impact	1	1	Reversibility of Impact	4	4
Duration of Impact	2	2	Probability	4	2
Environmental Risk (Pre-mitigation)					**-12**
Environmental Risk (Post-mitigation)					**-6**
Degree of confidence in impact prediction:					Medium

Impact Prioritisation	
Public Response	1
N/A	
Cumulative Impacts	2
This impact can accumulate if more than one site is negatively affected.	
Degree of potential irreplaceable loss of resources	1
No irreplaceable resources should be affected	
Prioritisation Factor	1.5

Mitigation Measures

• The identification of proposed prospecting drill sites will be determined in consultation with the affected landowner/s once the preliminary investigations area complete and the target areas have been identified.
• Prospecting should be conducted such that the sense of place as experienced by landowners, occupants and visitors is not negatively impacted upon. It is recommended that no Prospecting activities should be undertaken within 500m from an existing residential dwelling unless with written approval is obtained from the affected landowner.
• Where possible a distance of at least 150m will be provided between the prospecting operations and any fence,

windmill, or built structure unless with written approval is obtained from the affected landowners/ lawful occupier No prospecting activities will take place within 100 me of any Eskom distribution or Transmission line.	
Final Significance	**-9**

Impact name:	*Impact of dust (nuisance) from drilling*
Alternative:	*N/A*
Description of impact:	*The impact of nuisance dust may potentially affect landowners, livestock and wildlife.*

Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	3	1
Extent of Impact	1	1	Reversibility of Impact	2	2
Duration of Impact	2	2	Probability	4	2
Environmental Risk (Pre-mitigation)					**-8**
Environmental Risk (Post-mitigation)					**-3**
Degree of confidence in impact prediction:					Medium

Impact Prioritisation	
Public Response	1
N/A	
Cumulative Impacts	1
This impact can accumulate if more than one site is negatively affected.	
Degree of potential irreplaceable loss of resources	1
No irreplaceable resources should be affected	
Prioritisation Factor	1

Mitigation Measures

• Road speed limits within the area should be adhered to (recommended at 40km/hr.);
• Retention of vegetation where possible will reduce dust entrainment;
• When excessive dust is noted on site, the necessary dust control methods will be implemented, including but not limited to the damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust;
• Prospecting and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into residential areas;

• Recommended buffers to residential dwellings must be adhered to.	
Final Significance	**-3**

Impact name:	*Fire hazards created during prospecting activities from drilling*				
Alternative:	*N/A*				
Description of impact:	*Uncontrolled fire hazards can pose a significant impact and risk to the landowners (flora, fauna and physical structures).*				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	3	1
Extent of Impact	1	1	Reversibility of Impact	2	2
Duration of Impact	2	2	Probability	4	2
Environmental Risk (Pre-mitigation)					**-8**
Environmental Risk (Post-mitigation)					**-3**
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
N/A					
Cumulative Impacts					2
This impact can accumulate if more than one site is negatively affected.					
Degree of potential irreplaceable loss of resources					2
Fire may result in the loss of irreplaceable resources					
Prioritisation Factor					1.5
Mitigation Measures					

• No open fires will be allowed on-site and no worker will be allowed to discard cigarettes or cigarette butts (or any other waste) into the environment. The proposed prospecting area should be regarded as a no-smoking zone by all workers. • Fire extinguishers will be kept at all drilling sites and on all vehicles. • Special care must be taken in the dry season to reduce the amount of dry vegetative and flammable material from within the prospecting drill/ investigation site. • Fire prevention measures should be planned and designed in consultation with the landowners and local fire control association.	
Final Significance	**-4.5**

Impact name:	*Impact on Sense of place from drilling*
Alternative:	*N/A*
Description of impact:	*Impact on sensitive receptors created by drilling operation noise and site infrastructure*

Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	3	1
Extent of Impact	1	1	Reversibility of Impact	2	3
Duration of Impact	2	2	Probability	4	2
Environmental Risk (Pre-mitigation)					**-8**
Environmental Risk (Post-mitigation)					**-3.5**
Degree of confidence in impact prediction:					Medium

Impact Prioritisation	
Public Response	1
N/A	
Cumulative Impacts	1
This impact can accumulate if more than one site is negatively affected.	
Degree of potential irreplaceable loss of resources	2
This impact would not normally result in the loss of irreplaceable resources	
Prioritisation Factor	1.5
Mitigation Measures	

• No prospecting activities should be undertaken within 500m from an existing residential dwelling unless where written approval is obtained from the affected landowner; • Working hours will be limited to normal working hours, i.e. from 7:00 to 16:00 during weekdays and 7:00 to 13:00 on Saturdays. Where possible work on Saturdays will be avoided, especially near potentially noise sensitive areas. However, if unavoidable, affected landowners and occupants will be negotiated with to minimise any disturbance. No prospecting activities will take place on Sundays and public holidays. Working hours will be defined based on consultation with the effected landowner; • Apart from the requirement that noisy activities should be limited to normal business working hours, if possible, such surveys should be avoided during cold and calm weather conditions, particularly during winter mornings (when ambient noise is carried most easily). The scheduling and location of any airborne surveys must be communicated timeously to the affected landowner to allow for the relocation of his livestock if necessary; • Noise from labourers on site must be controlled; • The contractor must take measures to prevent labourers from loitering in the area and causing noise and other disturbance; • All vehicles and equipment/machinery must be kept in good working order; and • Noise levels due to prospecting activities should not exceed 55 dBA (measured in accordance with SANS10103), as experienced by the nearest noise sensitive receivers (i.e. local residents and visitors).	
Final Significance	**-5.25**

Impact name:	*Waste collection and disposal from drilling*				
Alternative:	*N/A*				
Description of impact:	*Improper waste disposal, from waste generated by the drilling operations, could potentially impact on water, soil and fauna*				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	3	1
Extent of Impact	1	1	Reversibility of Impact	4	2
Duration of Impact	2	2	Probability	4	2
Environmental Risk (Pre-mitigation)					**-10**
Environmental Risk (Post-mitigation)					**-3**
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
N/A					
Cumulative Impacts					1
This impact can accumulate if more than one site is negatively affected.					
Degree of potential irreplaceable loss of resources					2
This impact would not normally result in the loss of irreplaceable resources					
Prioritisation Factor					1.5
Mitigation Measures					

• Removed soils and overburden will be collected and stored in a designated area (as close as practically possible to the drill point). Where necessary the materials will be used for rehabilitation of the site (any excess will be disposed of at a suitable disposal facility. • General solid wastes will be collected and stored on site in closed, secure (scavenger proof) storage containers. The content of these containers will be disposed of at a suitably licensed facility on a regular basis (at least once a week). The quantities of waste to be generated will be too small to justify on-site separation of different waste streams for recycling (volumes too low to be viable). • No waste material is to be disposed of on site. • Contaminated water, if any, created during prospecting must be collected and disposed of at a suitably licensed facility. No contaminated water will be released into the environment • No littering should be allowed and no litter or wind-blown waste must be allowed to leave the site (apart from when it is collected for lawful disposal) and the site must be kept clean, neat and tidy at all times.	
Final Significance	**-4.5**

Impact name:	*Soil pollution, soil conservation and erosion control from drilling*
Alternative:	*N/A*
Description of impact:	*Improper waste disposal, from waste generated during drilling operations, could potentially impact on water, soil*

Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	3	2
Extent of Impact	1	1	Reversibility of Impact	4	2
Duration of Impact	2	2	Probability	4	2
Environmental Risk (Pre-mitigation)					**-10**
Environmental Risk (Post-mitigation)					**-3.5**
Degree of confidence in impact prediction:					Medium

Impact Prioritisation	
Public Response	1
N/A	
Cumulative Impacts	1
This impact can accumulate if more than one site is negatively affected.	
Degree of potential irreplaceable loss of resources	2
This impact would not normally result in the loss of irreplaceable resources	
Prioritisation Factor	1.5
Mitigation Measures	

• Topsoil will be stripped to its full depth (including the "O" and "A" horizons but excluding the "B" and "C" horizons) from all areas where significant soil compaction, pollution is likely to occur due to prospecting related disturbances, including temporary footprint of settling ponds (if required), and the footprint of the drill rig. Care must be taken not to mix topsoil and subsoil during stripping. After the topsoil has been stripped, it will be stored separate from subsoil, in the following manner:
• To prevent the development of anoxic conditions, soil compaction and loss of soil biota, stripped topsoil will be placed/stored on temporary stockpiled not exceeding 1.5 meter in height, and storage will be for the shortest period possible (not longer than 6 months).
• To prevent compaction and loss of soil structure, no vehicles or machines will be allowed to drive over or being parked on the topsoil stockpiles.
• To prevent erosion of topsoil, the stockpile will not be placed within the 1:100 year floodline of a water course, and will not be placed within the path of a stormwater channel, and if necessary, will be provided with a silt fence around the perimeter of the foot of the stockpile.
• To prevent the establishment of s seed bank or accumulation of other propagules of alien invasive plants within/on the topsoil stockpile, the growth of weed species on the stockpile will be controlled.

The following general topsoil management strategies will be adopted:
• The biological, chemical and physical properties of the topsoil must not be changed by introducing detrimental foreign material, gravel, rock, rubble or mine residue to such soil (MPRDA Regulation 70(7))
• Should any topsoil become polluted the polluted soil should be managed as a spill as described in section 6.6.2 below.
• During drilling an impermeable lining/tray must be placed under any equipment which may leak hazardous substances (e.g. the drilling machine and other vehicles). All spilled hazardous substances must be collected and adequately disposed of at a suitably licensed facility.
• It is recommended that drilling fluids are collected in impermeable sumps (preferably closed tanks) and re-used where possible (if not contaminated). In addition collected drilling fluid residues must be disposed of at a suitably licensed disposal facility. It is further recommended that only environmentally friendly drilling fluids are utilised (non-toxic and biodegradable, where available).

After prospecting related disturbances cease:

• The disturbed area will be reinstated. If subsoil was removed the subsoil will be placed back first. Before topsoil is spread, the compacted area will be deep-ripped to a depth of at least 30 cm where soil depth permits.
• The access tracks and other areas where significant compaction has occurred must be deep ripped to allow for re-establishment of vegetation.
• All directly disturbed areas must be seeded with an applicable grass mixture.
• Wind screening and stormwater control should be undertaken to prevent loss of topsoil from the site.
• All erosion control mechanisms need to be regularly maintained.
• Vegetation should be retained where possible to avoid soil erosion. No unnecessary disturbance or removal of existing vegetation is permitted.
• In the event that new access tracks are required, adequate stormwater control must be implemented to prevent erosion and excessive ponding.
• Re-vegetation of disturbed surfaces (with suitable species) should occur immediately after prospecting activities are completed at each borehole site.
• To prevent stormwater damage, the increase in stormwater run-off resulting from prospecting activities must be estimated and the drainage system assessed accordingly, to prevent downstream impacts on water resources (including but not limited to: scouring, sedimentation, erosion and undercutting). Where possible prospecting activities should not take place during the wet season.
• No prospecting will take place on steep slopes (gradient greater than 1:10) or within 100 m of any water course or resource.
• No un-rectified pollution of topsoil is permitted.

Final Significance	**-5.25**

Impact name:	*Acid mine drainage pollution in ground water created after drilling operations*
Alternative:	*N/A*
Description of impact:	*Very low probability of AMD generation in boreholes after prospecting activities have ceased –*

Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	3	2
Extent of Impact	2	2	Reversibility of Impact	4	3
Duration of Impact	4	4	Probability	4	1
Environmental Risk (Pre-mitigation)					**-13**
Environmental Risk (Post-mitigation)					**-2.75**
Degree of confidence in impact prediction:					Medium

Impact Prioritisation	
Public Response	1
N/A	
Cumulative Impacts	1
This impact can accumulate if more than one site is negatively affected.	
Degree of potential irreplaceable loss of resources	2
This impact would not normally result in the loss of irreplaceable resources	
Prioritisation Factor	1.5
Mitigation Measures	
This Impact would be a **very low risk impact and HIGHLY unlikley**, since the size and quantity of the boreholes are very limited. AMD could potentially only occur if the well is not capped and oxygen enters the borehole shaft after it has filled with water. The likelihood of water and oxygen coming into contact with leachable metals in geological strata is highly improbable..	
Final Significance	**-4.125**

3.4 Potential impact on heritage resources

Impact name:	*Impacts on identified and / or un-identified historic and cultural features from drilling*
Alternative:	*N/A*
Description of impact:	*Prospecting activities have the potential to impact on known or unknown cultural heritage resources during the duration of the process.*

Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	3	1
Extent of Impact	2	2	Reversibility of Impact	4	3
Duration of Impact	4	4	Probability	1	1
Environmental Risk (Pre-mitigation)					**-3.25**
Environmental Risk (Post-mitigation)					**-2.5**
Degree of confidence in impact prediction:					Medium

Impact Prioritisation	
Public Response	1
N/A	
Cumulative Impacts	1
This impact can accumulate if more than one site is negatively affected.	
Degree of potential irreplaceable loss of resources	2
This impact would not normally result in the loss of irreplaceable resources	
Prioritisation Factor	1.5
Mitigation Measures	
• It is recommended that the identification of proposed prospecting drill sites be determined in consultation with the affected landowner/s once the preliminary investigations area complete and the target areas have been identified. No prospecting activities will be undertaken within 50m of a physical structure (including	

residential dwellings) or graveyard. • If any artefact or site of heritage value or graves is uncovered during prospecting, the prospecting activities should be stopped immediately and South African Heritage Resource Agency and the local police (in case of graves or human remains) contacted immediately and consulted with regarding any further requirements.

Final Significance	**-3.75**

Impact name:	*Impact on land use from drilling*
Alternative:	*N/A*
Description of impact:	The proposed prospecting activities may impede land use or prevent the use of such land for an average period of one month.

Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature of Impact	-1	-1	Magnitude of Impact	3	1
Extent of Impact	2	2	Reversibility of Impact	4	3
Duration of Impact	4	4	Probability	1	1
Environmental Risk (Pre-mitigation)					**-3.25**
Environmental Risk (Post-mitigation)					**-2.5**
Degree of confidence in impact prediction:					Medium

Impact Prioritisation	
Public Response	1
N/A	
Cumulative Impacts	1
This impact can accumulate if more than one site is negatively affected.	
Degree of potential irreplaceable loss of resources	2
This impact would not normally result in the loss of irreplaceable resources	

Prioritisation Factor	1.5
Mitigation Measures	
• This impact is largely mitigated due to the temporary nature of the prospecting and the small footprint required for the drilling sites	
Final Significance	**-3.75**

3.5 Assessment of potential cumulative impacts.

The cumulative effect has been assessed for each of the impact assessment boxes above in section 3.1.2

3.6 Proposed mitigation measures to minimise adverse impacts.

Mitigation measures for each of the impact assessment boxes has been described above in section 3.1.2

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

Mitigation measures for each of the impact assessment boxes has been described above in section 3.1.2

3.8 Concomitant list of appropriate technical or management options

Refer to the EMP, in Section 5.2 and associated monitoring plan (Table 6)

3.9 Review the significance of the identified impacts

Mitigation measures for each of the impact assessment boxes has been described above in section 3.1.2

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

4.1 Plans for quantum calculation purposes.

Refer to the Drill Site Locality map in Appendix C

4.2 Alignment of rehabilitation with the closure objectives

The rehabilitation plan complies with the closure objectives in that the environmental will be rehabilitated to

pre-mining conditions.

4.3 Quantum calculations.

Phase:	Funding Provision
Rehabilitation of the surface	R5 000
Prevention and Management of the pollution water	R5 000
Prevention of leakage of water and minerals	R5 000
Decommissioning and closure	R5 000

4.4 Undertaking to provide financial provision

Financial provision for environmental Impact and Rehabilitation as provided by the Applicant: **R20 000-00.**

This amount has been determined and provided for by the Applicant as detailed in the attached Prospecting Works 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.

Drilling and bulk sampling from drill cores:

- Vegetation loss through clearing
- Loss of Biodiversity
- Impact on livestock and farming activities
- Impact on sensitive vegetation and biodiversity area
- Impact on water resources
- Impacts of access tracks.
- Safety Risk to land owners
- Impact on existing residential areas and structures
- Impact of dust (nuisance)

- Fire hazards created during prospecting activities
- Sense of place
- Waste collection and disposal
- Impacts on identified and / or un-identified historic and cultural features.
- Impact on land use
- Soil pollution, soil conservation and erosion control
- Acid mine drainage impact on ground water – **Highly improbable**

Refer to Table 6 below for the planned monitoring of the aspects.

Table 6: Planned monitoring of the aspects

Impact	Aspects	Method / location	Standards	Frequency / monitoring method	Monitoring type / Reporting frequency	Non-compliance procedure
Vegetation loss through clearing	Flora, Fauna	Visual marking of sensitive species in drilling site.	Comply with relevant EMP mitigation measures	Prior to site establishment. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP. Relocate affected specie if accidentally disturbed.
Loss of Biodiversity	Flora, Fauna	Visual marking of sensitive species in drilling site. Visual conformation that no hunting has occurred or vegetation has been removed for fire wood.	Comply with relevant EMP mitigation measures	Prior to site establishment. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP.
Impact on livestock and farming activities	Land use, cultural	Visual observation that livestock and farming activities are not	Comply with relevant EMP mitigation	Prior to site establishment. Weekly during	Visual observation / Monthly audit	Rectify as indicated for specific impact mitigation measure in EMP.

	practices, health and safety	affected in drilling site.	measures	operation. EMP checklist	report	Negotiate with landowner over compensation
Impact on sensitive vegetation and biodiversity area	Flora, Fauna	Visual marking of sensitive species in drilling site.	Comply with relevant EMP mitigation measures	Prior to site establishment. Weekly during operation. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP. Rectify as indicated for specific impact mitigation measure in EMP. Relocate affected specie if accidentally disturbed.
Impact on water resources	Water	Establish drill site further than 100m away from water resources.	Comply with relevant EMP mitigation measures	Prior to site establishment. Weekly during operation. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP. Spill response kit should be utilised to mitigation accidental spills.
Impacts of access tracks.	Flora, Fauna, soil	Visual marking and deviation of access around sensitive features.	Comply with relevant EMP mitigation measures	Prior to site establishment. EMP checklist	Visual observation / Monthly audit	Rectify as indicated for specific impact mitigation measure in EMP.

					report	
Health and Safety Risk to land owners	Land use, health and safety	Inform landowners in writing of intent and comply with reasonable request to reduce the impact.	Comply with relevant EMP mitigation measures	Prior to site establishment. Weekly during operation. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP.
Impact on existing residential areas and structures	Land use, health and safety	Inform landowners in writing of intent and comply with reasonable request to reduce the impact	Comply with relevant EMP mitigation measures	Prior to site establishment. Weekly during operation. EMP checklist	Visual observation / Monthly	Rectify as indicated for specific impact mitigation measure in EMP.
Impact of dust and noise (nuisance)	Cultural practices	Visual inspection that dust does not migrate beyond drill site boundaries.	Comply with relevant EMP mitigation measures, and Dust and Noise Regulations	Prior to site establishment. Weekly during operation. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP.
Fire hazards created during prospecting activities	Land use, health and safety	Inform landowners in writing of intent and comply with reasonable request to reduce the	Comply with relevant EMP mitigation	Prior to site establishment. Weekly during	Visual observation / Monthly audit	Rectify as indicated for specific impact mitigation measure in EMP.

		impact.	measures	operation. EMP checklist	report	
Sense of place	Land use, Cultural practices	Inform landowners in writing of intent and comply with reasonable request to reduce the impact.	Comply with relevant EMP mitigation measures	Prior to site establishment. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP.
Waste collection and disposal	Flora Fauna Soil Water Health and safety Land use	Visual inspection that waste does not accumulate inside or outside drill site.	Comply with relevant EMP mitigation measures	Prior to site establishment. Weekly during operation. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP.
Impacts on identified and / or un-identified historic and cultural features.	Cultural practices	Visual inspection by drilling personnel. Specialist consultant required if any cultural features are to be affected by drill site	Comply with relevant EMP mitigation measures	Prior to site establishment. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP.

Impact on land use	Land use Cultural practices	Inform landowners in writing of intent and comply with reasonable request to reduce the impact. Visual confirmation of rehabilitation	Comply with relevant EMP mitigation measures	Prior to site establishment. Monthly during operation. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP.
Soil pollution, soil conservation and erosion control	Soil Water	Visual confirmation of soil conservation and erosion control where required.	Comply with relevant EMP mitigation measures	Prior to site establishment. Monthly during operation. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP.
Acid mine drainage impact on ground water	Water Soil Cultural practices	Visual confirmation that well has been sealed and capped during rehabilitation	Comply with relevant EMP mitigation measures	Prior to site establishment. Monthly during operation. EMP checklist	Visual observation / Monthly audit report	Rectify as indicated for specific impact mitigation measure in EMP.

Table 7: Prospecting Activity and Impact mitigation summary

Activity	Duration	Mitigation description
Mapping	2 months	No impact
Mineralogy	3 months	No impact
Geophysics	2 months	No impact
Diamond Drilling	5 months	Bio degradable chemical will be used during drilling. On completion of drilling, the Project manager shall clear away any temporary works of every kind. Areas thus cleared shall be graded and scarified as near as practical before topsoil placement and ameliorated with natural fertilizer to promote biological activity.
Transportation of personnel and equipment	10 months	All equipment moved onto site or off site during a project is subject to the legal requirements as well as the exploration permit holder's specifications for the transport of such equipment. Oil filled equipment such as CT's, VT's and capacitor cans have specific safety requirements regarding their handling, transport and storage. The Project manager shall meet these safety requirements under all circumstances. All equipment transported shall be clearly labelling as to their potential hazards according to specifications. All the required safety labelling on the containers and trucks used shall be in place. The Project manager shall ensure that all the necessary precautions against damage to the environment and injury to persons are taken in the event of an accident and shall supply a method statement to that effect.
Access roads	36 months for	No additional access roads are foreseen. In the event that more are required the removal of vegetation must be

	the duration of the project	63minimized by keeping the width of the road at a minimum. Roads shall be made to allow for the natural flow of water where required. All areas susceptible to erosion shall be monitored and protected with suitable erosion control measures.
Use of hydro carbons – drilling - transportation	36 months for the duration of the project	All maintenance of vehicles and equipment shall take place in a dedicated area. During servicing of vehicles or equipment, a suitable drip tray shall be used to prevent carbon spills onto the soil, especially where emergency repairs are effected outside the workshop area. Leaking equipment shall be repaired immediately. All potentially hazardous and non-degradable waste shall be collected and removed to a registered waste site . A method statement is required from the project manager to show procedures for dealing with possible emergencies that can occur, such as fire and accidental leaks and spillages. The Project manager shall be in possession of an emergency spill kit that must be complete and available at all times on site. All hazardous substances shall be stored in suitable containers and storage areas shall be bunded. This includes all carbon substances like fuel and oil as well as herbicides and battery acid. A register shall be kept on all substances and be available for inspection at all times. Areas shall be monitored for spills and any spills shall be contained, cleaned and rehabilitated immediately. Any leaking containers shall be repaired or removed from site. Storage areas shall display the required safety signs depicting “No smoking”, “No naked lights” and “Danger”.

		Containers shall be clearly marked to indicate contents as well as safety requirements.
Chemical toilets	5 months	To prevent the deterioration of surface and/or ground water quality, the Project manager must provide adequate ablution facilities. Every effort must be made to prevent the contamination of surface or groundwater. Toilets should be kept in a hygienic state with toilet paper supplied.
Waste management	5 months	Ensure that no litter, refuse, wastes, rubbish, rubble, debris and any other wastes generated on the premises be placed, dumped or deposited outside the designated dustbins. 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 a recognized disposal facility or buried at a suitable depth. An educational litter program shall be introduced. Aspects of littering should be included in the regular project meetings. Ensure that no refuse wastes are burnt on the premises.

5.2 Functional requirements for monitoring programmes.

ENVIRONMENTAL MANAGEMENT PLAN:

This Environmental Management Plan contains guidelines, operating procedures and rehabilitation/pollution control requirements which will be binding on the holder of the mining permit/ prospecting permission/ reconnaissance permission after approval of the Environmental Management Plan. It is essential that this portion be carefully studied, understood, implemented and adhered to at all time.

5.2.1 GENERAL REQUIREMENTS

5.2.1.1 MAPPING AND SETTING OUT

5.2.1.1.1 LAYOUT PLAN

- A copy of the layout plan as provided for in Regulation 2.2 must be available at the prospecting/mining 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, mining 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 mine or when operations have ceased.

NOTE: Regulation 2.2 of the regulations promulgated in terms of the Act requires:

"An application contemplated in sub-regulation (1) must be accompanied by a plan that must contain –

(a) the co-ordinates of the land or area applied for;

(b) the north point;

(c) the scale to which the plan has been drawn;

(d) the name, number and location of the land or area covered by the application; and

(e) in relation to farm boundaries and surveyed points-

(i) the size and shape of the proposed area;

(ii) the boundaries of the land or area comprising the subject of the application concerned;

(iii) the layout of the proposed reconnaissance, prospecting, exploration, mining or production operations;

(iv) surface structures and servitudes;

(v) the topography of the land or area; "

5.2.**1.1.2 DEMARCATING THE MINING/ PROSPECTING AREA**

- The mining/ 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.
- Permanent beacons as indicated on the layout plan or as prescribed by the Regional Manager must be firmly erected and maintained in their correct position throughout the life of the operation.
- Mining/ prospecting and resultant operations shall only take place within this demarcated area.

5.2.1.1.3 DEMARCATING THE RIVER CHANNEL AND RIVERINE ENVIRONMENT

The following is applicable if operations are conducted within the riverine environment

- Beacons as indicated on the layout plan or as prescribed by the Regional Manager must be erected and maintained in their correct position throughout the life of the operation.
- These beacons must be of a permanent nature during the operations and must not be easily removable, especially those in a river channel. The beacons must, however, be removed at the end of the operations.
- The mining of and prospecting for any mineral shall only take place within this demarcated mining area.
- If riverine vegetation is present in the form of reeds or wetland vegetation, the presence of these areas must be entered in the EMPlan and indicated on the layout plan.
- The holder of the mining permit/ prospecting right will also be required to permanently demarcate the areas as specified in the EMP

5.2.**1.2 RESTRICTIONS ON MINING/ PROSPECTING**

- On assessment of the application, the Regional Manager may prohibit the conducting of mining or prospecting operations in vegetated areas or over portions of these areas
- In the case of areas that are excluded from mining or prospecting, no operations shall be conducted within 5 m of these areas.

5.2.1.3 RESPONSIBILITY

- The environment affected by the mining/ prospecting operations shall be rehabilitated by the holder, as far as is practicable, to its natural state or to a predetermined and agreed to standard or land use which conforms with the concept of sustainable development. The affected environment shall be maintained in a stable condition that will not be detrimental to the safety and health of humans and

animals and that will not pollute the environment or lead to the degradation thereof.

- It is the responsibility of the holder of the mining permit/ prospecting right to ensure that the manager on the site and the employees are capable of complying with all the statutory requirements which must be met in order to mine, which includes the implementation of this EMP.
    - If operations are to be conducted in an area that has already been disturbed, the holder must reach specific agreement with the Regional Manager concerning the responsibilities imposed upon himself/herself pertaining to the rehabilitation of the area and the pollution control measures to be implemented.

5.2.2 INFRASTRUCTURAL REQUIREMENTS

5.2.**2.1 TOPSOIL**

- Topsoil shall be removed from all areas where physical disturbance of the surface will occur.
- All available topsoil shall be removed after consultation with the Regional Manager prior to the commencement of any operations.
- The topsoil removed, shall be stored in a bund wall on the high ground side of the mining/prospecting area outside the 1:50 flood level within the boundaries of the mining area/ prospecting.
- 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.

5.2.**2.2 ACCESS TO THE SITE**

5.2.2.2.1 Establishing access roads on the site

- The access road to the mining/prospecting 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.
- If imported material is used in the construction or upgrading of the access road this must be listed.

- 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.

NOTE: The design, construction and location of access to provincial roads must be in accordance with the requirements laid down by the Provincial or controlling authority.

5.2.2.2.2 Maintenance of access roads

- In the case of dual or multiple uses of access roads by other users, arrangements for multiple responsibility must be made with the other users. If not, the maintenance of access roads will be the responsibility of the holder of the mining permit/ prospecting right.

- Newly constructed access roads shall be adequately maintained so as to minimise dust, erosion or undue surface damage.

5.2.2.2.3 Dust control on the access and haul roads

- 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.

5.2.2.2.4 Rehabilitation of access roads

- Whenever a mining permit/ prospecting right is suspended, cancelled or abandoned or if it lapses and the holder does not wish to renew the permit or right, any access road or portions thereof, constructed by the holder and which will no longer be required by the landowner/tenant, shall be removed and/or rehabilitated to the satisfaction of the Regional Manager.

- Any gate or fence erected by the holder which is not required by the landowner/tenant, shall be removed and the situation restored to the pre mining/ prospecting situation.

- Roads shall be ripped or ploughed, and if necessary, appropriately fertilised (based on a soil analysis) to ensure the regrowth of vegetation. Imported road construction materials which may hamper regrowth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.

- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation, be corrected and the area be seeded with a seed mix to the Regional Manager's specification.

5.2.2.3 OFFICE/CAMP SITES

5.2.2.3.1 Establishing office / camp sites

- Office and camp sites shall 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.
- The area chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation. Topsoil shall be handled as described in F 2.1 above
- No camp or office site shall be located closer than 100 metres from a stream, river, spring, dam or pan.
- No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner/tenant.
- Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break shall be cleared around the perimeter of the camp and office sites.
- Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner/tenant/persons lawfully living in the vicinity shall be kept to a minimum.

5.2.2.3.2 Toilet facilities, waste water and refuse disposal

- As a minimum requirement, the holder of a mining permit/ prospecting right shall, at least, provide pit latrines for employees and proper hygiene measures shall be established.
- Chemical toilet facilities or other approved toilet facilities such as a septic drain shall preferably be used and sited on the camp site in such a way that they do not cause water or other pollution.
- The use of existing facilities must take place in consultation with the landowner/tenant.
- In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to.
- 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 200 metres, from any stream, river, pan, dam or borehole.
- Only domestic type wash water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances must 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 to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognised facility.
- 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 a

recognised disposal facility**.** Specific precautions shall be taken to prevent refuse from being dumped on or in the vicinity of the camp site.

- Biodegradable refuse generated from the office/camp site, processing areas vehicle yard, storage area or any other area shall either be handled as indicated above or be buried in a pit excavated for that purpose and covered with layers of soil, incorporating a final 0,5 metre thick layer of topsoil (where practicable). Provision should be made for future subsidence of the covering.

5.2.2.3.3 Rehabilitation of the office/camp site

- On completion of operations, all buildings, structures or objects on the camp/office site shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), which states:

(*1) When a prospecting right, mining right, retention permit or mining permit lapses, is cancelled or is abandoned or when any prospecting or mining operation comes to an end, the holder of any such right or permit may not demolish or remove any building, structure, object -*

(a) which may not be demolished in terms of any other law;

(b) which has been identified in writing by the Minister for purposes of this section; or

(c) which is to be retained in terms of an agreement between the holder and the owner or occupier of the land, which agreement has been approved by the Minister in writing.

(2) The provision of subsection (1) does not apply to bona fide mining equipment which may be removed

- Where office/camp sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.
- Photographs of the camp and office sites, before and during the mining/ prospecting operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

5.2.2.4 VEHICLE MAINTENANCE YARD AND SECURED STORAGE AREAS

5.2.2.4.1 Establishing the vehicle maintenance yard and secured storage areas

- The 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.
- The area chosen for these purposes shall be the minimum reasonably required and involve the least disturbance to tree and plant life. Topsoil shall be handled as described in F 2.1 above.
- 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.

5.2.2.4.2 Maintenance of vehicles and equipment

- The maintenance of vehicles and equipment used for any purpose during the mining/prospecting operation will take place only in the maintenance yard area.
- Equipment used in the mining/prospecting process must be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
- Machinery or equipment used on the mining/prospecting area must not constitute a pollution hazard in respect of the above substances. The Regional Manager shall order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.

5.2.2.4.3 Waste disposal

- Suitable covered receptacles shall be available at all times and conveniently placed for the disposal of waste.
- All used oils, grease or hydraulic fluids shall be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.
- All spills should be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognised facility.

5.2.2.4.4 Rehabilitation of vehicle maintenance yard and secured storages areas

- On completion of mining/prospecting operations, the above areas shall be cleared of any contaminated soil, which must be dumped as referred to in section F 2.4.3 above.

- All buildings, structures or objects on the vehicle maintenance yard and secured storage areas shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002.

- The surface shall then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent the site, shall be spread evenly to its original depth over the whole area. The area shall then be fertilised if necessary (based on a soil analysis).

- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.

- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

5.2.3 OPERATING PROCEDURES IN THE MINING AREA

5.2.3.1 Limitations on mining/prospecting

- The mining of or prospecting for precious stones shall take place only within the approved demarcated mining or prospecting area.

- Mining/ prospecting may be limited to the areas indicated by the Regional Manager on assessment of the application.

- The holder of the mining permit/ prospecting right shall ensure that operations take place only in the demarcated areas as described in section F 1.1.2 above.

- Operations will not be conducted closer than one and a half times the height of the bank from the edge of the river channel and in such manner that the stability of the bank of the river is effected.

- Precautions shall also be taken to ensure that the bank of the river is adequately protected from scouring or erosion. Damage to the bank of the river caused by the operations, shall be rehabilitated to a condition acceptable to the Regional Manager at the expense of the holder.

- Restrictions on the disturbance of riverine vegetation in the form of reeds or wetland vegetation must be adhered to. The presence of these areas must be entered in Part of the programme and indicated on the layout plan.

3.5.3.3. THE WATER USE LICENCE

- The National Water Act, (Act 36 of 1998), is based on the principles of sustainability, efficiency and equity, meaning that the protection of water resources must be balanced with their development and use.

- In addition to being issued with a prospecting right or mining permit a small-scale miner

may also need to get a **water use licence** for the proposed water uses that will take place, except in certain cases.

- NOTE: The Department of Water Affairs and Forestry (DWAF) developed specific Best Practice Guideline for small scale mining that relates to stormwater management, erosion and sediment control and waste management. Copies of these guidelines can be obtained from the regional office of DME or DWAF.

- Applications for a water use licence must be made in good time, such that approval can be granted before a water use activity can begin. The appropriate licence forms for each kind of expected water use should be completed together with supporting documentation. The main supporting document required is a technical report. To make the technical report easier, you can refer to sections in this EMPlan, as most of what the technical report requires has already been done in the EMPlan. If you refer to the EMPlan it must be attached to the technical report.

5.2.3.3 EXCAVATIONS

5.2.3.3.1 Establishing the excavation areas

- Whenever any excavation is undertaken for the purpose of locating and/or extracting ore bodies of all types of minerals, including precious stone-bearing gravels, the following operating procedures shall be adhered to:

  - ❖ Topsoil shall, in all cases (except when excavations are made in the river-bed), be handled as described in F 2.1 above.

  - ❖ Excavations shall take place only within the approved demarcated mining/prospecting area.

  - ❖ Overburden rocks and coarse material shall be placed concurrently in the excavations or stored adjacent to the excavation, if practicable, to be used as backfill material once the ore or gravel has been excavated.

  - ❖ Trenches shall be backfilled immediately if no ore or precious stone-bearing gravel can be located.

5.2.3.3.2 Rehabilitation of excavation areas

The following operating procedures shall be adhered to:

- The excavated area must serve as a final depositing area for the placement of tailings during processing.

- Rocks and coarse material removed from the excavation must be dumped into the excavation simultaneously with the tailings.

- Waste, as described in paragraph F 2.3.2 above, will not be permitted to be deposited in the

excavations.

- Once excavations have been refilled with overburden, rocks and coarse natural materials and profiled with acceptable contours and erosion control measures, the topsoil previously stored, shall be returned to its original depth over the area.
- The area shall be fertilised if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/ prospecting operation, be corrected and the area be seeded with a vegetation seed mix to his or her specification.

5.2.3.4 PROCESSING AREAS AND WASTE PILES (DUMPS)

5.2.3.4.1 Establishing processing areas and waste piles

- Processing areas and waste piles shall not be established within 100 metres of the edge of any river channel or other water bodies.
- Processing areas should be established, as far as practicable, near the edge of excavations to allow the waste, gravel and coarse material to be processed therein.
- The areas chosen for this purpose shall be the minimum reasonably required and involve the least disturbance to vegetation.
- Prior to development of these areas, the topsoil shall be removed and stored as described in paragraph F 2.1 above.
- The location and dimensions of the areas are to be indicated on the layout plan and once established, the processing of ore containing precious stones shall be confined to these areas and no stockpiling or processing will be permitted on areas not correctly prepared.
- Tailings from the extraction process must be so treated and/or deposited that it will in no way prevent or delay the rehabilitation process.

5.2.3.4.2 Rehabilitation of processing areas

- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- On completion of mining/prospecting operations, the surface of the processing areas especially if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 300mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.
- Prior to replacing the topsoil the material that was removed from the processing area will be

replaced in the same order as it originally occurred.

- The area shall then be fertilised if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

5.2.3.6 FINAL REHABILITATION

- All infrastructure, equipment, plant, temporary housing and other items used during the mining period will be removed from the site (section 44 of the MPRDA)
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on the site.
- Final rehabilitation shall be completed within a period specified by the Regional Manager.

5.3 Roles and responsibilities for the execution of monitoring programmes.

- Regular monitoring of all the environmental management measures and components **shall be carried out by the holder of the prospecting right**, mining permit or reconnaissance permission in order to ensure that the provisions of this programme are adhered to.
- Ongoing and regular reporting of the progress of implementation of this programme will be done.
- Various points of compliance will be identified with regard to the various impacts that the operations will have on the environment.
- Inspections and monitoring shall be carried out on both the implementation of the programme and the impact on plant and animal life.
- Visual inspections on erosion and physical pollution shall be carried out on a regular basis

5.4 Committed time frames for monitoring and reporting.

- Layout plans will be updated on a regular basis and updated copies will be submitted on a biennial basis to the Regional Manager
- Reports confirming compliance with various points identified in the environmental management programme will be submitted to the Regional Manager on a regular basis and as decided by the said manager.

- Any emergency or unforeseen impact will be reported as soon as possible.

An assessment of environmental impacts that were not properly addressed or were unknown when the programme was compiled shall be carried out and added as a corrective action

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

6.1 Rehabilitation plan

The Rehabilitation plan will include the following:

- Removal of drill rig,
- Filling in of sumps used during drilling,
- Rehabilitation of all areas to pre-prospecting state and includes all access tracks, drill site etc,
- Fencing of the drill site where required,
- Waste removal to a certified site.
- Once off post rehabilitation monitoring, to confirm completion of objectives?

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

All disturbed areas will be returned to the pre-prospecting condition- unless a separate agreement/use is requested by the landowner. In such a case the relevant provisions and obligations of all other legislation must be considered prior to closure.

The intended end use for the disturbed prospecting areas and the closure objectives will be defined in consultation with the relevant landowner/s. Proof of such consultation will be submitted together with the Application for Closure Certificate.

However, if no special agreements has been made with landowners and approved of by DMR, all areas affected or disturbed by prospecting and associated activities will be rehabilitated as described in Section F, so that the land could be returned to its pre-prospecting condition or better. The end-use for such rehabilitated areas will be the same as before prospecting took place.

6.3 Confirmation of consultation

Refer to the uploaded consultation report

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

7.1 Identification of interested and affected parties.

Organisation/ Company	Contact Person	Date	Comments received	Response
Local Authority				
Department of Rural Development and Land Affairs	Private Bag X5007 Kimberley 8300	20 January 2012	Via registration letter and Email: On the 20 January 2012 a notification letter and registration form was sent via registered letter to the authorities. On the 19 January 2012 a notification letter and registration form was sent via email.	No comments have been received up to date.
Department of Environmental Affairs	Private Bag X447 Pretoria 0001	20 January 2012	Via registration letter and Email: On the 20 January 2012 a notification letter and registration form was sent via registered letter to the authorities. On the 19 January 2012 a notification letter and registration form was sent via email.	No comments have been received up to date.
Northern Cape Heritage Resources Agency	P O Box 1930 Kimberley 8300	20 January 2012	Via registration letter and Email: On the 20 January 2012 a notification letter and registration form was sent via registered letter to the authorities. On the 19 January 2012 a notification letter and registration form was sent via email.	No comments have been received up to date.
North West Provincial Government	Private Bag X65 Mmabatho 2735	20 January 2012	Via registration letter and Email: On the 20 January 2012 a notification letter and registration form was sent via registered letter to the authorities. On the 19 January 2012 a notification letter and registration form was sent via email.	No comments have been received up to date.
John Taolo Gaetsewe District Municipality	P O Box 1480 Kuruman 8460	20 January 2012	Via registration letter and Email: On the 20 January 2012 a notification letter and registration form was sent via registered letter to the authorities. On the 19 January 2012 a notification letter and registration form was sent via email.	No comments have been received up to date.
Landowners and Neighbours				
Chief Pule Bareki	Pule.bareki@gmail.com 082 216 8721	21 January 2012	Via hand delivery: On the 28 January 2012 a notification letter and registration form where delivered to C Chief Pule Bareki.	No comments have been received up to date.

Please note that the public and landowner consultation is still ongoing. On completion of the consultation there may be a need to revise certain conditions of this EMP. Following completion of the consultation an Issues and Responses Report will be submitted to the DMR together with any recommendations for inclusion in the EMP.

Table 8: Affected landowners and notification

Refer to the uploaded consultation report

7.2 **The details of the engagement process**.

Refer to the uploaded consultation report

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

- Refer to the uploaded consultation report

7.4 List of which parties identified in 6.1 above that were in fact consulted, and which were not consulted.

None received

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

None received

7.6 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.

None received

7.7 Other concerns raised by the aforesaid parties.

None received

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

Refers to the consultation report

7.9 Information regarding objections received.

No issues or objection received from IAP's

7.10 **The manner in which the issues raised were addressed**.

No issues or objection received from IAP's

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

8.1 Employee communication process

<u>Monitoring of Awareness</u> Bi-monthly Health and Safety meetings are held where relevant issues regarding health, safety and environment are discussed and feedback is given. Environmental awareness is in process of being incorporated into the compulsory 'Tool box talks' that include health and safety issues. These are done on a monthly basis.

8.2 Description of solutions to risks.

The provisions in the EMP coupled with the environmental awareness training program should adequately mitigate risks.

8.3 Environmental awareness training.

Awareness Programme: **Training programmes:** **1. Occupational Health and Safety (OHS) – Done internally by NMR.** **2. Personal Protection Equipment (PPE) – Done internally by NMR.** **3. Environmental training - program 1 – Introduction to Environment, Ecosystems and Habitats. Including symbiotic interactions.**

4. **Environmental training - program 2 – Environmental Degradation, Soil, Air, Noise, Water and Ground water Pollution. Erosion.**

Programmes 1 and 2, the OHS and PPE training is something that is already in place and training is done either annually or bi-annually depending on the need identified by management of the quarry.

Programmes 3 and 4 regarding the environmental training and awareness will be implemented a.s.a.p. Management will arrange for training bi-annually for 2 to 4 hour sessions at a time. Training will either be done internally or externally. Internal training will be done by the Environmental Management Department and externally training providers will be sourced as approved by Procurement Policy as prescribed by the Municipal Finance Management Act.

Table 9: Awareness plan

Activity	Impact	Aspects	Mitigation measure	Applicable training
• Drill site operation, • Waste disposal/pollution, • Rehabilitation, • Consultation with land owners, • Sensitive biodiversity. • Borehole closure and capping.	• Safety risk to land owners, • Fire hazard, • Impact of dust and noise (nuisance) • Impact on existing residential areas and structures, • Sense of place, • Impact on water resources, • Impacts of access tracks, • Health and Safety Risk to land owners, • Impact on existing residential areas and structures, • Impact of dust and noise (nuisance), • Fire hazards created during prospecting activities,	Flora, Fauna, Cultural practices, Water,	• Educating workers not to litter, no fires on site. • Educate workers about EMP provisions. • Implementation of environmental monitoring programme. • Dust suppression. • Occupational health program to be implemented. • Education on HIV/AIDS • Wearing of PPE (hearing protection and dust masks) by employees. • Compilation of Emergency Response Procedures for dangerous goods spills.	1, 2, 3 & 4 conducted by applicant

	• Sense of place • Waste collection and disposal, • Impacts on identified and / or un-identified historic and cultural features. • Impact on land use, • Soil pollution, soil conservation and erosion control.			

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.

Financial provision for environmental Impact and Rehabilitation as provided by the Applicant: **R15 000-00.**

This amount has been determined and provided for by the Applicant as detailed in the attached Prospecting Works Program. It was determined by evaluating the cost assisted with ripping land to reduce compaction, filling in sumps, ameliorating with fertiliser and wild seed mix and a final clean-up of site.

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

This amount has been determined and provided for by the Applicant as detailed in the attached Prospecting Works 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.	
Full Names and Surname	Takalani Nicolette Mudau
Identity Number	810207 0329 087

-END-

ANNEXTURE A: List of IUCN threatened species with the potential to occur inside the application area.

DEFINITIONS OF THE CATEGORIES	
EX (Extinct)	A taxon is Extinct when there is no reasonable doubt that the last individual has died. Taxa should be listed as extinct only once exhaustive surveys throughout the historic range have failed to record an individual.
EW (Extinct in the Wild)	A taxon is Extinct in the Wild when it is known to only survive in cultivation or as a naturalised population (or populations) well outside the past range.
CR PE (Critically Endangered, Possibly Extinct)	Critically Endangered (possibly extinct) taxa are those that are, on the balance of evidence, likely to be extinct, but for which there is a small chance that they may be extant. Hence they should not be listed as Extinct until adequate surveys have faile
CR (Critically Endangered)	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five IUCN criteria for Critically Endangered, and is therefore facing an extremely high risk of extinction in the wild.
EN (Endangered)	A taxon is Endangered when the best available evidence indicates that it meets any of the five IUCN criteria for Endangered, and is therefore facing a very high risk of extinction in the wild.
VU (Vulnerable)	A taxon is Vulnerable when the best available evidence indicates that it meets any of the five IUCN criteria for Vulnerable, and is therefore facing a high risk of extinction in the wild.
NT (Near Threatened)	A taxon is Near Threatened when available evidence indicates that it nearly meets any of the five IUCN criteria for Vulnerable, and is therefore likely to qualify for a threatened category in the near future.
Critically Rare	A taxon is Critically Rare when it is known to only occur at a single site, but is not exposed to any direct or plausible potential threat and do not qualify for a category of threat according to the five IUCN criteria.
Rare	A taxon is Rare when it meets any of the four South African criteria for rarity, but is not exposed to any direct or plausible potential threat and do not qualify for a category of threat according to the five IUCN criteria.
Declining	A taxon is Declining when it does not meet any of the five IUCN criteria and does not qualify for the categories Critically Endangered, Endangered, Vulnerable or Near Threatened, but there are threatening processes causing a continuing decline in the popu
LC (Least Concern)	A taxon is Least Concern when it has been evaluated against the five IUCN criteria and does not qualify for the categories Critically Endangered, Endangered, Vulnerable and Near Threatened, or the South African categories Critically Rare, Rare or Declinin
DDD (Data Deficient - Insufficient Information)	A taxon is DDD when there is inadequate information to make an assessment of its risk of extinction. Data Deficient is not a category of threat, however, listing of taxa in this category indicates that more information is required and that future research
DDT (Data Deficient - Taxonomically Problematic)	A taxon is DDT when taxonomical problems hinder its distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible.
Thr*	Taxa that have been identified as likely to be threatened during the final stages of the compilation of this Red List. Their status has however not yet been finalized.
NE	Not Evaluated (Plants of South Africa Website)

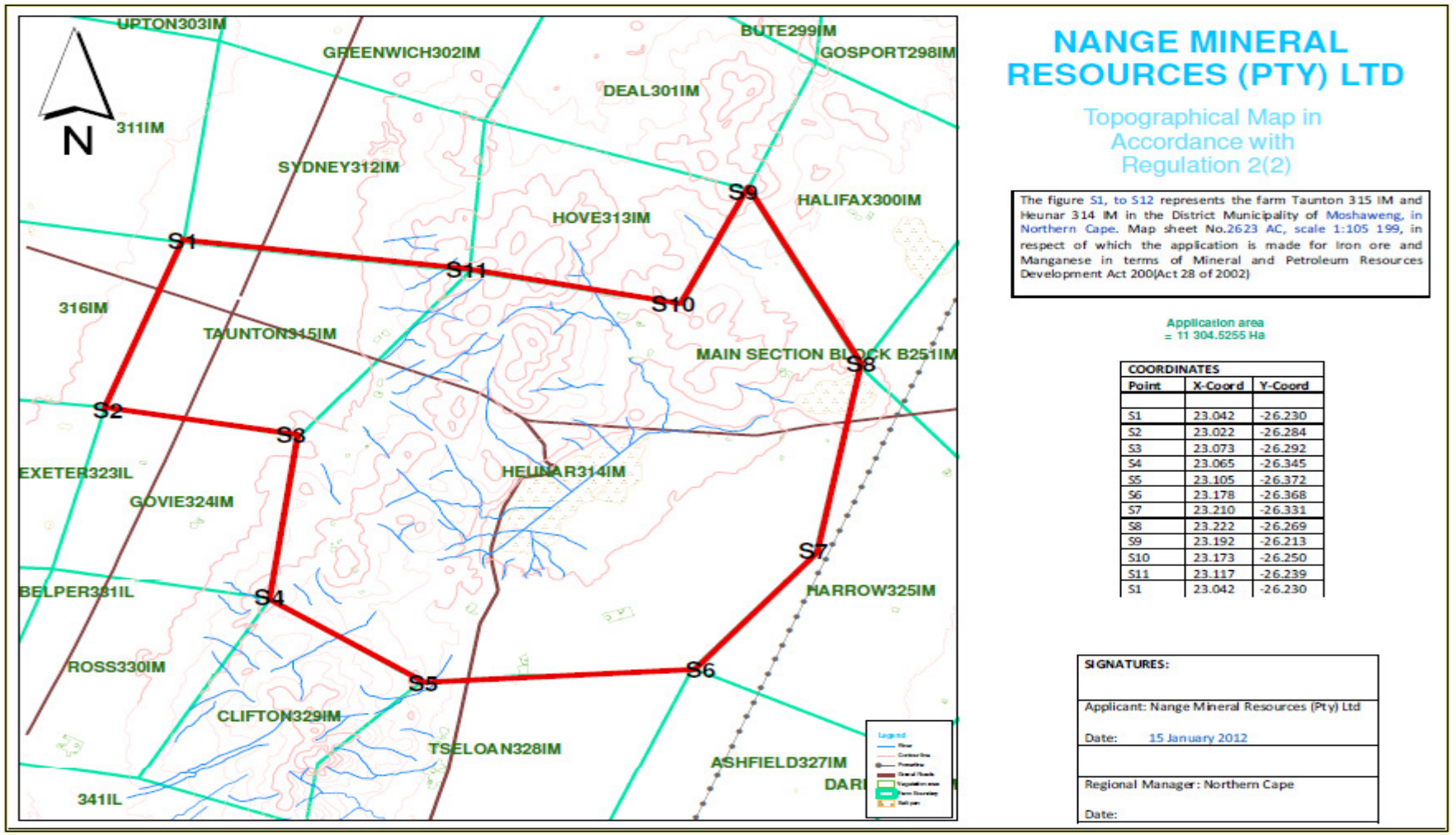
FamilyName	SpeciesName	Common Name	IUCN	CITES	Category
Gruidae	Bugeranus carunculatus	Wattled Crane	CR	Appendix II	Animals
ARDEIDAE	Botaurus stellaris	Bittern	CR	Not listed	Animals
Chrysochloridae	Chrysospalax villosus	Rough-haired Golden Mole	CR	Not listed	Animals
Chrysochloridae	Neamblysomus julianae (Pretoria subpopulation)	Juliana's Golden Mole (Pretoria Subpopulation)	CR	Not listed	Animals
Hipposideridae	Cloeotis percivali	Percival's Trident Bat	CR	Not listed	Animals
Ciconiidae	Ephippiorhynchus senegalensis	Sadcle-billed Stork	EN	Deleted	Animals
Ciconiidae	Ephippiorhynchus senegalensis	Sadclebilled Stork	EN	Deleted	Animals
Bovidae	Ourebia ourebi	Oribi	EN	Not listed	Animals

Muridae	Mystromys albicaudatus	White-tailed Rat	EN	Not listed	Animals
Rynchopidae	Rynchops flavirostris	African Skimmer	EX	Not listed	Animals
Alaudidae	Mirafra cheniana	Latakoo Lark	NT	Not listed	Animals
Buphagidae	Buphagus erythrorhynchus	Red-billed Oxpecker	NT	Not listed	Animals
Buphagidae	Buphagus erythrorhynchus	Redbilled Oxpecker	NT	Not listed	Animals
Charadriidae	Charadrius pallidus	Chestnut-banded Plover	NT	Not listed	Animals
Ciconiidae	Anastomus lamelligerus	African Openbill	NT	Not listed	Animals
Ciconiidae	Ciconia nigra	Black Stork	NT	Appendix II	Animals
Ciconiidae	Leptoptilos crumeniferus	Marabou Stork	NT	Appendix III	Animals
Ciconiidae	Mycteria ibis	Yellowbilled Stork	NT	Not listed	Animals
Estrildidae	Spermestes fringilloides	Magpie Mannikin	NT	Not listed	Animals
Falconidae	Falco biarmicus	Lanner Falcon	NT	Appendix II	Animals
Falconidae	Falco peregrinus	Peregrine Falcon	NT	Appendix I	Animals
Glareolidae	Glareola nordmanni	Blackwinged Pratincole	NT	Not listed	Animals
Halcyonidae	Alcedo semitorquata	Halfcollared Kingfisher	NT	Not listed	Animals
Laridae	Sterna caspia	Caspian Tern	NT	Not listed	Animals
Muscicapidae	Platysteira peltata	Black-throated Wattle-eye	NT	Not listed	Animals
Otididae	Eupodotis caerulescens	Blue Korhaan	NT	Appendix II	Animals
Pelecanidae	Pelecanus onocrotalus	Great White Pelican	NT	Not listed	Animals
Phoenicopteridae	Phoenicopterus minor	Lesser Flamingo	NT	Appendix II	Animals
Phoenicopteridae	Phoenicopterus ruber	Greater Flamingo	NT	Appendix II	Animals
Rostratulidae	Rostratula benghalensis	Greater Painted-snipe	NT	Not listed	Animals
Sagittariidae	Sagittarius serpentarius	Secretarybird	NT	Appendix II	Animals
Timaliidae	Lioptilus nigricapillus	Bush Blackcap	NT		Animals
ACCIPITRIDAE	Aquila ayresii	Ayres' Eagle	NT	Not listed	Animals
ACCIPITRIDAE	Circus maurus	Black Harrier	NT	Appendix II	Animals
ACCIPITRIDAE	Macheiramphus alcinus	Bat Hawk	NT	Appendix II	Animals
SYLVIIDAE	Schoenicola brevirostris	Broad-tailed Warbler	NT	Not listed	Animals
Chrysochloridae	Amblysomus septentrionalis	Highveld Golden Mole	NT	Not listed	Animals
Erinaceidae	Atelerix frontalis	South African Hedgehog	NT	Not listed	Animals
Hyaenidae	Hyaena brunnea	Brown Hyaena	NT	Not listed	Animals
Muridae	Dasymys incomtus	Common Dasymys	NT	Not listed	Animals
Mustelidae	Lutra maculicollis	Spotted-necked Otter	NT	Appendix II	Animals
Mustelidae	Mellivora capensis	Ratel	NT	Appendix III	Animals
Rhinolophidae	Rhinolophus clivosus	Geoffroy's Horseshoe Bat	NT	Not listed	Animals

Rhinolophidae	Rhinolophus darlingi	Darling's Horseshoe Bat	NT	Not listed	Animals
Vespertilionidae	Miniopterus schreibersii	Schreibers' Long-fingered Bat	NT	Not listed	Animals
Vespertilionidae	Myotis tricolor	Cape Hairy Bat	NT	Not listed	Animals
Vespertilionidae	Myotis welwitschii	Welwitch's Bat	NT	Not listed	Animals
Vespertilionidae	Pipistrellus rusticus	Rusty Bat	NT	Not listed	Animals
Falconidae	Falco naumanni	Lesser Kestrel	VU	Appendix II	Animals
Gruidae	Anthropoides paradiseus	Blue Crane	VU	Appendix II	Animals
Heliornithidae	Podica senegalensis	African Finfoot	VU	Not listed	Animals
Otididae	Eupodotis senegalensis	White-bellied Korhaan	VU	Appendix II	Animals
Otididae	Eupodotis senegalensis	Whitebellied Korhaan	VU	Appendix II	Animals
Otididae	Neotis denhami	Denham's Bustard	VU	Appendix II	Animals
Pelecanidae	Pelecanus rufescens	Pink-backed Pelican	VU	Not listed	Animals
Plataleidae	Geronticus calvus	Bald Ibis	VU	Appendix II	Animals
Rallidae	Crex crex	Corn Crake	VU	Not listed	Animals
Rallidae	Sarothrura affinis	Striped Flufftail	VU	Not listed	Animals
Strigidae	Scotopelia peli	Pel's Fishing-Owl	VU	Appendix II	Animals
Tytonidae	Tyto capensis	African Grass-Owl	VU	Appendix II	Animals
ACCIPITRIDAE	Aquila rapax	Tawny Eagle	VU	Appendix II	Animals
ACCIPITRIDAE	Circus ranivorus	African Marsh Harrier	VU	Appendix II	Animals
ACCIPITRIDAE	Circus ranivorus	African Marsh-Harrier	VU	Appendix II	Animals
ARDEIDAE	Gorsachius leuconotus	White-backed Night-Heron	VU	Not listed	Animals
ACCIPITRIDAE	Gyps africanus	African Whitebacked Vulture	VU	Appendix II	Animals
ACCIPITRIDAE	Gyps coprotheres	Cape Vulture	VU	Appendix II	Animals
ACCIPITRIDAE	Polemaetus bellicosus	Martial Eagle	VU	Appendix II	Animals
Bovidae	Hippotragus niger subsp. niger	Sable Antelope	VU	Not listed	Animals
Chrysochloridae	Neamblysomus julianae	Juliana's Golden Mole	VU	Not listed	Animals
Felidae	Acinonyx jubatus	Cheetah	VU	Appendix I	Animals
Rhinolophidae	Rhinolophus blasii	Blasius's Horseshoe Bat	VU	Not listed	Animals
Soricidae	Crocidura maquassiensis	Maquassie Musk Shrew	VU	Not listed	Animals
Boidae	Python natalensis	African Rock Python		Appendix II	Animals
Cordylidae	Cordylus giganteus	Giant Girdled Lizard		Appendix II	Animals
FamilyName	**SpeciesName**	**Common Name**	**IUCN**	**CITES**	**Category**
PROTEACEAE	Serruria florida	Blushing bride	CR		Plants
ZAMIACEAE	Encephalartos dyerianus	Lillie cycad	CR	Appendix I	Plants
ZAMIACEAE	Encephalartos	Lowveld cycad	CR	Appendix I	Plants

	dyerianus				
ZAMIACEAE	Encephalartos middelburgensis	Middelburg cycad	CR		Plants
ASPHODELACEAE	Aloe peglerae	Red-hot poker	EN		Plants
ZAMIACEAE	Encephalartos eugene-maraisii	Waterberg cycad	EN	Appendix I	Plants
ORCHIDACEAE	Holothrix randii	tassel orchid	NT		Plants
HYACINTHACEAE	Bowiea volubilis subsp. volubilis	climbing onion	VU		Plants
HYACINTHACEAE	Bowiea volubilis subsp. volubilis	zulu potato	VU		Plants
ROSACEAE	Prunus africana	African almond	VU		Plants
ZAMIACEAE	Encephalartos lanatus	Olifant River cycad	VU	Appendix I	Plants

Annexure B: Regulation 2 (2) plan



Annexture C: Planned Activities Plan