



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: NEWSHELL (SOUTH AFRICA) RESOURCES (PTY) LTD

REFERENCE NUMBER: NW 30/5/1/1/2/11617 PR

ENVIRONMENTAL MANAGEMENT PLAN

SUBMITTED

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

STANDARD DIRECTIVE

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

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

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1 REGULATION 52 (2): DESCRIPTION OF THE ENVIRONMENT LIKELY TO BE AFFECTED BY THE PROPOSED PROSPECTING OR MINING OPERATION.

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

Atmosphere/air quality

Presently, the air quality is good due to the generally deserted nature of the area and thus lack of pollutants. Air pollution occurs in the form of carbon monoxide from vehicles which passes through the area using the R510 road and other secondary roads and tracks (Figure 1). The dry and arid nature of the area, which experiences high wind resulting in intermittent dust storms, especially in the summer months, has the main impact on the air quality of the area.

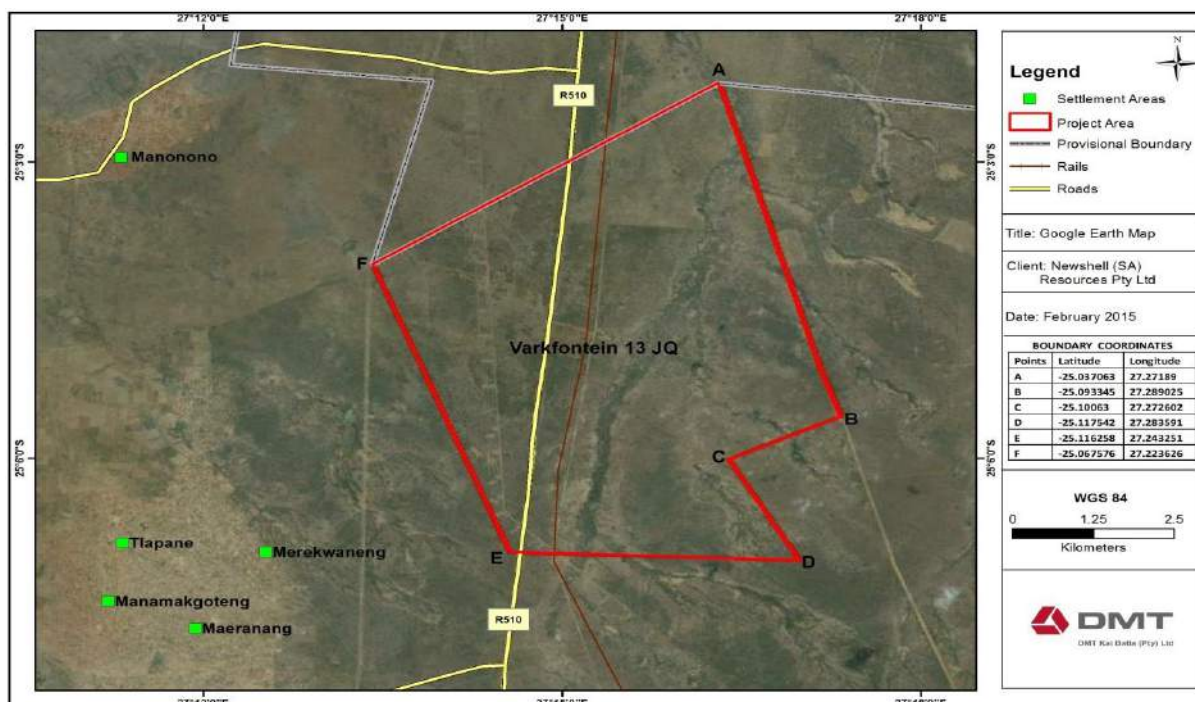


Figure 1: Locality map.

Noise

The only current sources of noise are from traffic on the farm roads transecting the property.

Infrastructure

- Railway line and railway station/siding.
- Power lines.
- The R510 arterial road, and secondary roads.
- Reservoir on the western portion of the area.

Terrain

The topography of the project area is characterised by plains with open low hills or ridges. See Figure 2 for a map showing the topography.

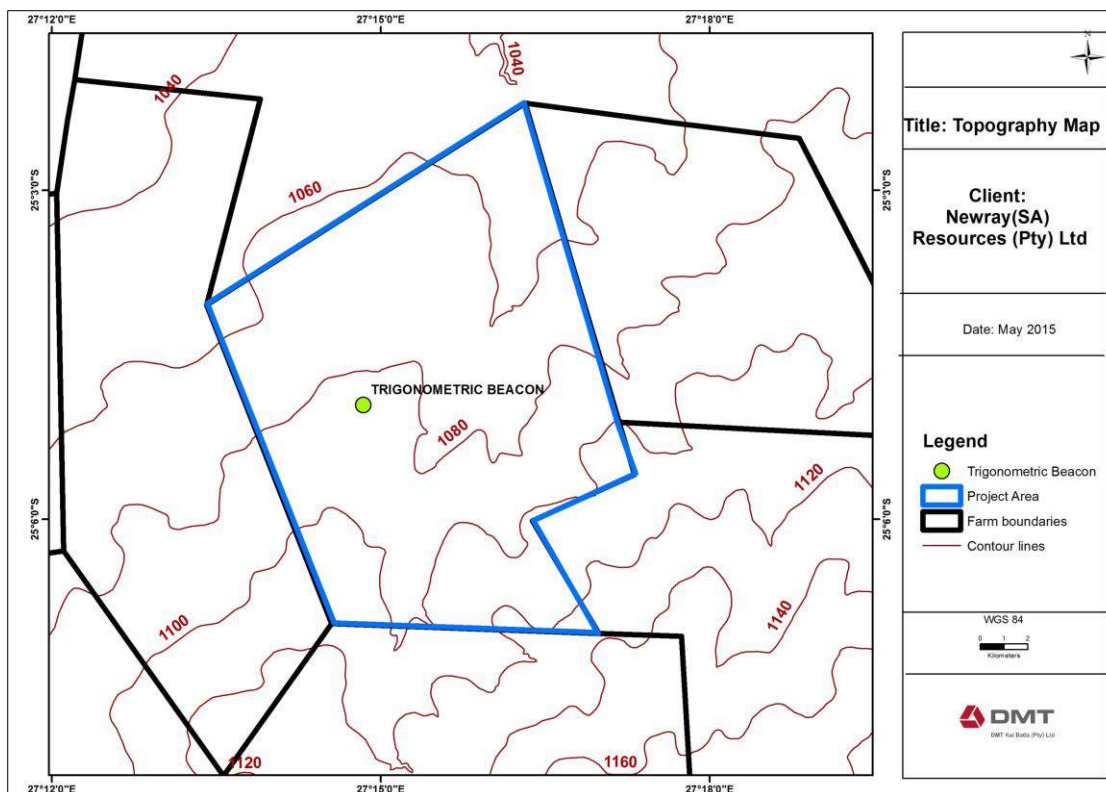


Figure 2: Map showing the topography of farm Varkfontein 13 JQ.

Climate

According to www.climate-data.org, Köppen and Geiger classifies the Sandfontein area as Csa (Hot-summer Mediterranean climate) by The climate around the Sandfontein is classified as warm and temperate. The temperature averages 19.2 °C. The temperatures are highest on average in January, at around 24.2 °C. June has the lowest average temperature of the year (11.8 °C) (Figure 3). The annual precipitation is 646 mm and the least amount of rainfall occurs in August (average is 4 mm). With an average of 126 mm, the most precipitation falls in December. There is more rainfall in the winter than in the summer (Figure 4).

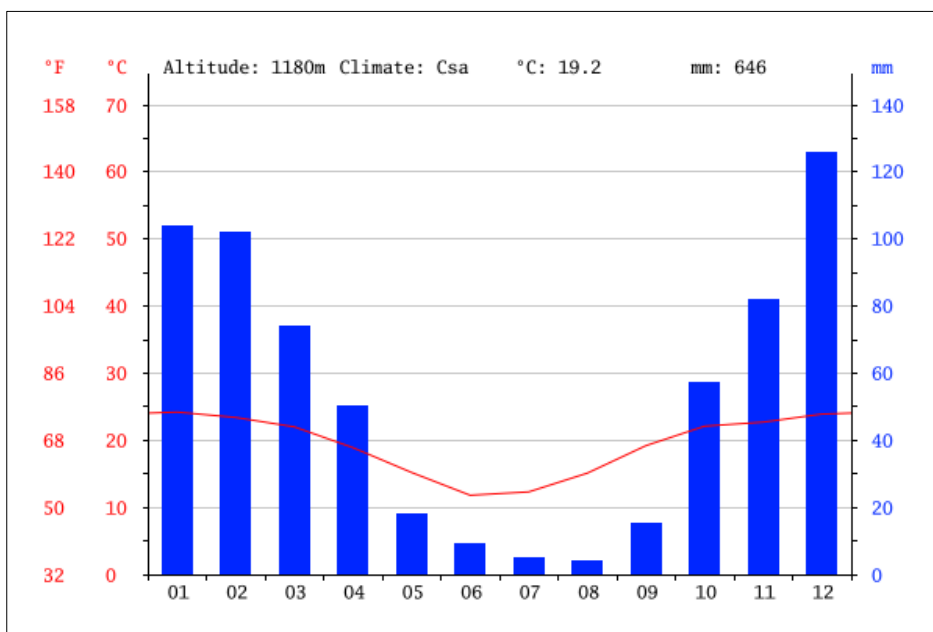


Figure 3: Precipitation graph (climate-data.org).

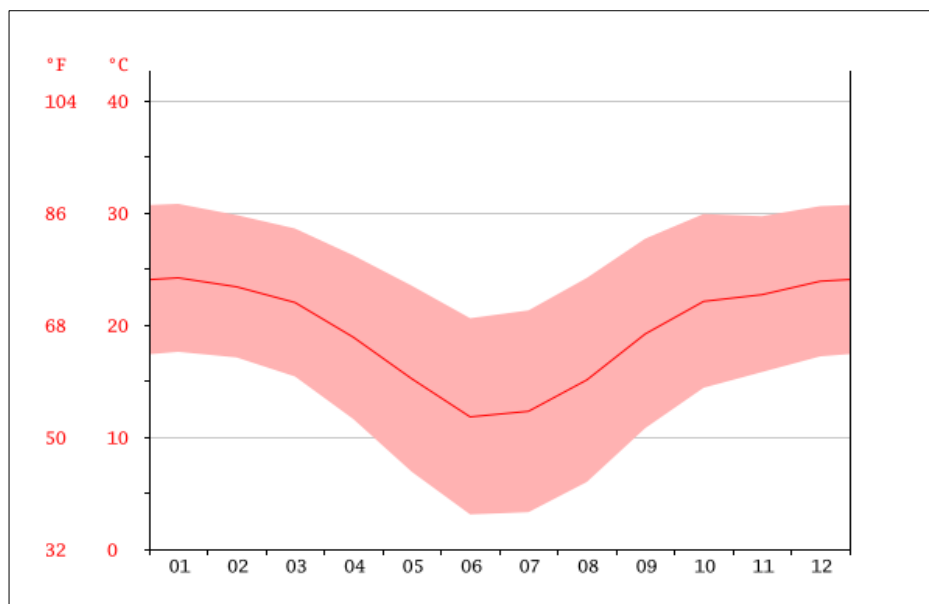


Figure 4: Temperature graph (climate-data.org).

Fauna

The North West Province has some of the largest traders of wildlife in the world. The 14 national parks, 10 registered conservancies and several game farms or ranches attest to this. Of the total area of about 160 000 Hectare of land committed to game farming, about 6% can be classified as true game farms. The remainder comprises game camps (fenced off portions of farms) that vary in size. The species being conserved on these farms are predominantly antelope such as kudu, duiker and steenbok. Other animals such as sable, Cape buffalo, gemsbok, eland, red hartebeest, blue wildebeest and even black rhinoceros also occur in the Province. In the Moses Kotane Local Municipality, uncontrolled hunting by villagers is a serious problem in the rural areas.

Flora

The project area is located in the Savanna Biome, within the Central Sandy Bushveld and Dwaalboom Thornveld Bioregions which have Central Sandy Bushveld (SVcB 12) and Dwaalboom Thornveld (SVcB1) vegetation types. The SVcB12 type of vegetation typically occurs in low undulating areas, sometimes between mountains and sandy plains and catena supporting tall, deciduous woodlands *Terminalia sercia* and *Bureka Africana* woodland on deep sandy soils, low broad leaf *Combretum* woodland on shallow rocky or gravelly soils. Species of *Acacia*, *Ziziphus* and *Euclea* are found on the flats and lower slopes on eutrophic sands and some less sandy soils. *A. Tortillis* may dominate some areas on the valley. The area has a grass-dominated herbaceous layer with relatively low basal cover on dystrophic sands.

According to Mucina & Rutherford, 2006, the SVcB 1 main vegetation and landscape features include plains with a layer of scattered, low to medium high, deciduous microphyllous trees and shrubs with a few broad-leaved tree species. There is virtually a continuous herbaceous layer subjugated by grass species. *Acacia tortilis* and *Acacia nilotica* dominate on the medium clays. On particularly heavy clays most other woody plants are excluded and the miniscule *Acacia tenuispina* dominates at a height of less than 1m above ground. On the sandy clay loam soils *Acacia erubescens* is the most noticeable tree. The soils are red-yellow loam, vertic/ melanic clay, soils with a plinthic catena

Soil

More than a third of the country's soils are shallow with minimal development. Soil characteristics in South Africa are described using 20 characteristics classes (Table 1).

In the North West Province, the predominant soil types are red-yellow apedal soils (Low clay) particularly in the western parts of the Province, followed by plinthic catena (ideal crop production soils) and glenrosa and mispah (predominantly shallow and rocky) forms.

According to the Agricultural Geo-Referenced Information System (AGIS), the project area is characterised by CM and LP1 soils. CM soils are red with high base status while LP1 soils have a minimal development, usually shallow, on hard or weathering rock, they may or may not have sporadic diverse soils. Lime on the other hand is rare or absent in the landscape (Figure 5).

Table 1: Soil characteristics on South Africa.

Red-yellow well drained soils generally lacking a strong texture contrast	
Ferralsols (FR)	Red and yellow soils with a humic horizon
Acrisols (AC)	Red and yellow, massive or weakly structured soils with low to medium base status
Cambisols (CM)	Red, massive or weakly structured soils with high base status
Soils with a plinthic catena	
Plinthosols1 (PT1)	Red, yellow and greyish soils with low to medium base status
Plinthosols2 (PT2)	Red, yellow and greyish soils with high base status
Soils with a strong texture contrast	
Luvisols1 (LV1)	Soils with a marked clay accumulation, strongly structured and a reddish colour
Luvisols2 (LV2)	Soils with a marked clay accumulation, strongly structured and a non-reddish colour In addition one or more of vertic, melanic and plinthic soils may be present
Well-structured soils generally with a high clay content	
Vertisols (VR)	Dark coloured, strongly structured soils dominated by cracking and swelling clays (vertic soils). In addition, one or more of melanic and red structured soils may be present
Phaezems/Kastanozems (PH/KS)	Soils with dark coloured, well-structured topsoil with high base status (melanic soils) In addition, one or more of vertic and red structured soils may be present
Nitisols (NT)	Deep, well drained, dark reddish soils having a pronounced shiny, strong blocky structure (nutty), usually fine (red structured soils). In addition, one or more of vertic and melanic soils may be present
Soils with limited pedological development	
Leptosols1 (LP1)	Soils with minimal development, usually shallow on hard or weathering rock, with or without intermittent diverse soils. Lime rare or absent in the landscape
Leptosols2 (LP2)	Soils with minimal development, usually shallow on hard or weathering rock, with or without intermittent diverse soils. Lime generally present in part or most of the landscape
Fluvisols (FL)	Soils with negligible to weak profile development, usually occurring on deep deposits
Sandy soils	
Arenosols1 (AR1)	Red, excessively drained sandy soils with high base status - dunes are present
Arenosols2 (AR2)	Red and yellow, sandy well drained soils with high base status
Arenosols3 (AR3)	Greyish, sandy excessively drained soils
Strongly saline soils	
Solonchaks (SC)	Strongly saline soils generally occurring in deep deposits on flat lands
Podzolic soils	
Podzols (PZ)	Soils with a sandy texture, leached and with sub-surface accumulation of organic matter and aluminium with or without iron oxides, either deep or on hard or weathering rock
Rocky areas	
Regosols (R)	Rock with limited soils

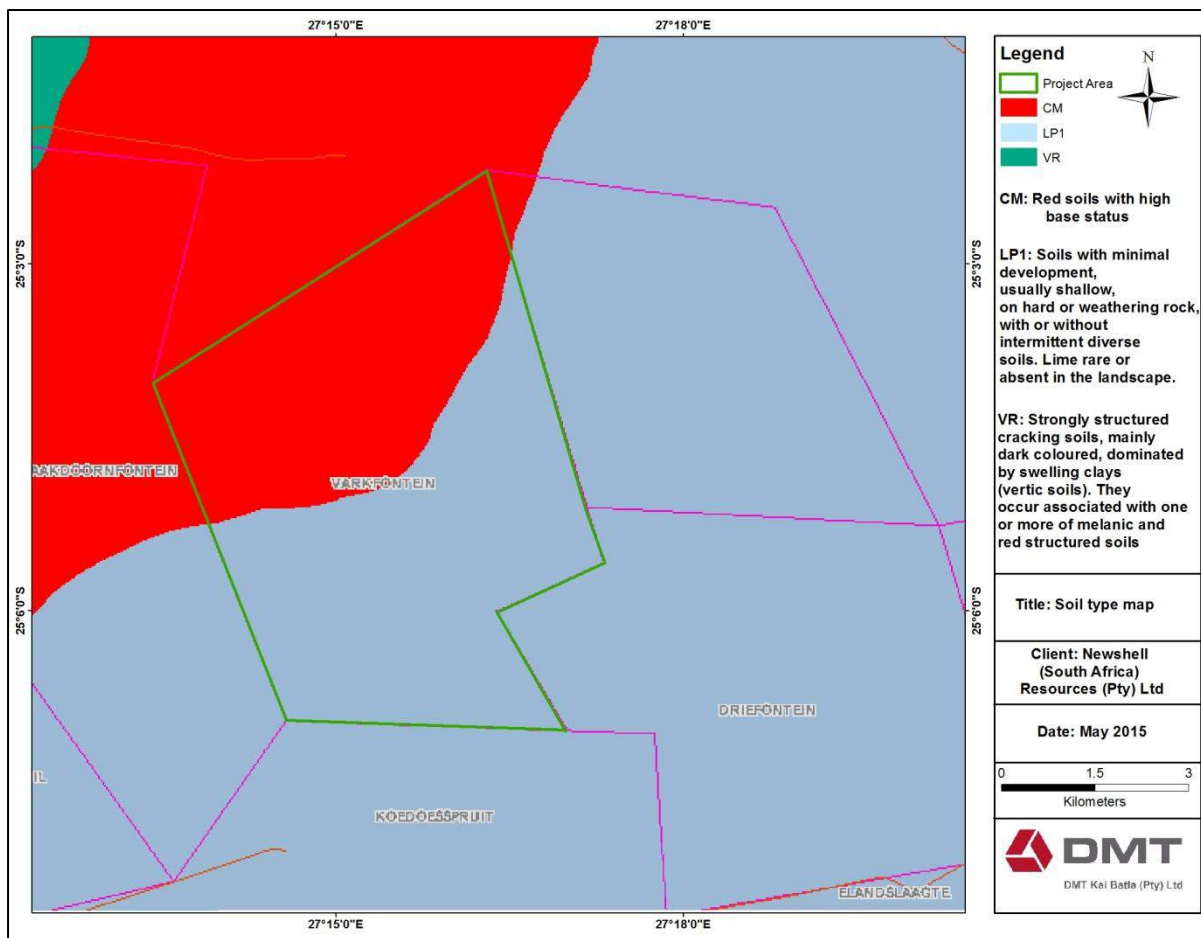


Figure 5: Soil type map.

Land use

The project area is predominantly natural land with some patches of degraded and cultivated area (see Figure 8). Vegetation degradation is usually regarded as a reduction in the available biomass, and decline in the vegetative ground cover, because of deforestation and overgrazing. Such degradation is a major contributory factor to soil degradation particularly with regard to soil erosion and loss of soil organic matter.

Land use features found within the project area include:

- **Roads:** The project area comprises an arterial road (R510) connecting Rustenburg and Northam. There exist other roads with the project area, including tracks/hiking trails within the project area.
- **Railway:** A railway line cuts across (north-south) the project area.
- **Railway station or siding:** The Groblersvlyt siding or station is found in the western part of the project area.
- **Power lines :** Power lines run north-south within the project area.
- **Reservoir:** A reservoir is located in the western part of the project area.

See Figure 7, Figure 8 and Figure 9 for locations of all land use features.

Land Capability

The project area land is classified as moderate potential arable-land according to AGIS. The characteristics of this type of land include:

- A severe permanent limitation that restricts the choice of alternative uses and the intensity of crop production is of moderate potential.
- The land is suitable for cropping, pasture, afforestation and other less intensive uses.
- When used for cultivated crops, the conservation practices are usually more difficult to apply and maintain

Geology and Minerals

Regional Geology

The Bushveld Igneous Complex (65 000 km²) is of Palaeoproterozoic age, and is located in the central northeast portion of the Kaapvaal Craton within southern Africa. The Bushveld Complex is comprised of four limbs, namely, the Northern, Eastern, Southern, and Western limbs. The project area is located on the Western limb, which extend from Warmbaths to Zeerust. Four groups of rocks make up the Bushveld Complex, and include the Rashedoep Granophyre Suite, Rustenburg Layered Suite, Lebowa Granite Suite and various satellite intrusions. The project area is underlain by lithologies of the Lebowa Granite Suite, Bushveld Igneous Complex (see Figure 6).

Local Geology and Mineralization

The Bushveld Complex is host to 80% of the world's Platinum Group Metals (PGM) reserves, 70% of its chromium reserves, as well as 30% of its titanium reserves. There may even be potential for additional resources of iron ore, titanium, tin, fluorspar, uranium, and Rare Earth Elements.

Granites of the Bushveld Complex are enriched in tin mineralization in more highly fractionated parts of the suite, such as that of the Northern limb, which is approximately 180 km northeast of the project area. The project area is dominantly comprised of rocks from the Lebowa Granite Suite, of the Western limb of the Bushveld Complex. This location does not show a potentially mineralized upper contact zone of granite, unlike the Northern and Eastern limb, as well as northern parts of the Western limb. However, approximately 50 km northeast of the project area, a potentially mineralized upper contact zone of granite has recorded tin mineralization. The Lebowa Granite Suite is subdivided into three major types of granites, namely, the Nebo, Bobbejaankop, and Lease Granites. Tin mineralization within the Bushveld Complex is restricted to the Lease and Bobbejaankop Granites, where it occurs in pipe-like bodies, sub-horizontal lenticular bodies and as sub-horizontal disseminated low grade bodies within both granites.

Water Resources

The project area falls within the Limpopo River Catchment and comprises a non-perennial river (Phufane) which branches run north-east and south-west (Figure 7). This river is also has a connection to numerous wetlands.

- Non-Perennial rivers

Non-perennial rivers are those rivers, which do not have a constant flow throughout the year. It mainly consists of those rivers which flow only during the rainy season. These are usually found in areas with arid climates where evaporation tends to be greater than precipitation. Usually, the stream flow declines on their course and they dry on occasions.

- Wetlands

A wetland is an area of marsh, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water

the depth of which at low tide does not exceed ten metres. The types of wetlands found within the project area are presented in Table 2

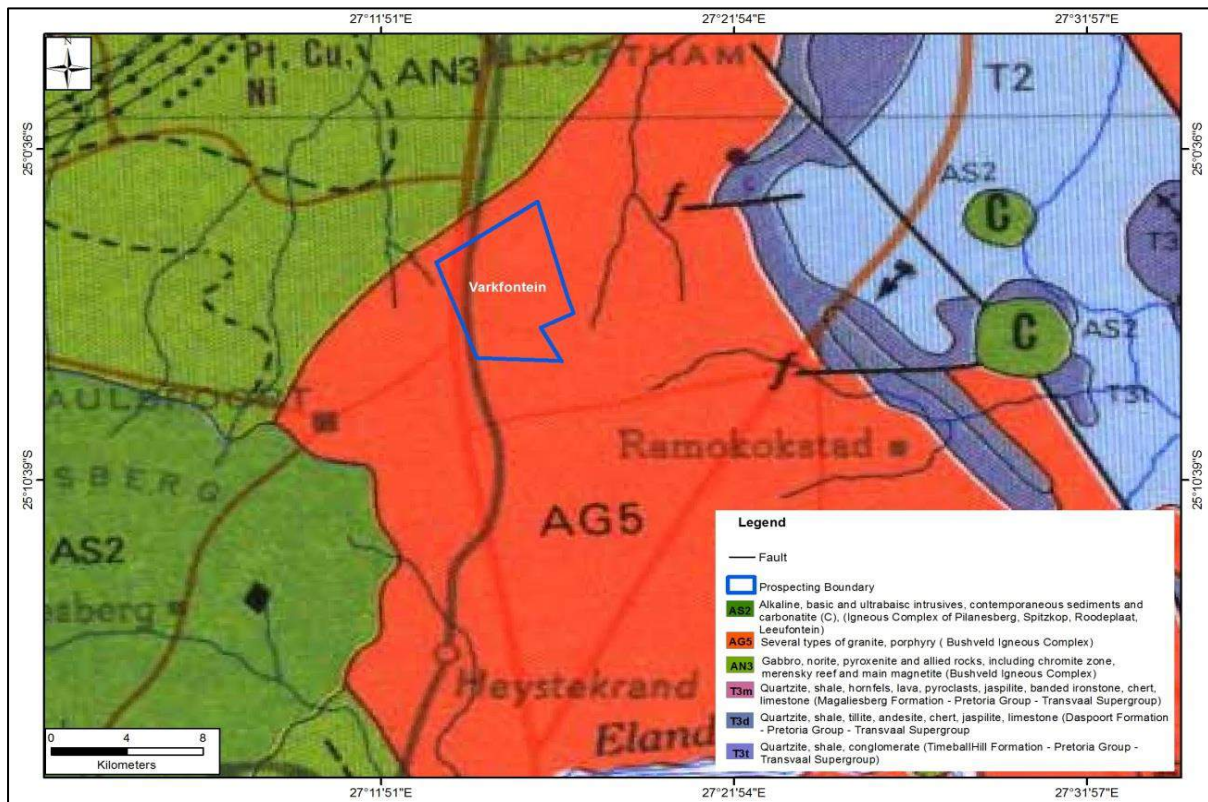


Figure 6: Geology of the project area.

Table 2: Description of wetland types found on the proposed project area.

Wetland landscape setting	Description
<p>Valley floor</p> <ul style="list-style-type: none"> The typically gently sloping, lowest surface of a valley. Valley floors exclude areas situated between two valley side-slopes where the floor-slope is steep enough to be characteristic of the Mountain Headwater Zone (i.e. gradient >0.1 or 1:10). The gradient of a valley floor is typically between 0.001 and 0.1 (i.e. 1:1000 to 1:10), although in certain situations (such as coastal areas with major dune systems) a valley floor may have a gradient of less than 0.001 (i.e. characteristic of the Lowland or Upland Floodplain Zones) 	<p>Channelled valley bottom wetland</p> <ul style="list-style-type: none"> A mostly flat valley-bottom wetland dissected by and typically elevated above a channel. Dominant water inputs to these areas are typically from the channel, either as surface flow resulting from overtopping of the channel bank/s or as interflow, or from adjacent valley-side slopes (as overland flow or interflow). Water generally moves through the wetland as diffuse surface flow, although occasional, short-lived concentrated flows are possible during flooding events. Small depressional areas within a channelled valley-bottom wetland can result in the temporary containment and storage of water within the wetland. Water generally exits in the form of diffuse surface flow and interflow, with the infiltration and evaporation of water from these wetlands also being potentially significant (particularly from depressional areas) <p>Unchannelled valley bottom wetland</p> <ul style="list-style-type: none"> A mostly flat valley-bottom wetland area without a major channel running through it,

Wetland landscape setting	Description
	<p>characterised by an absence of distinct channel banks and the prevalence of diffuse flows, even during and after high rainfall events.</p> <ul style="list-style-type: none"> • Water inputs are typically from an upstream channel, as the flow becomes dispersed, and from adjacent slopes (if present) or groundwater. • Water generally moves through the wetland in the form of diffuse surface flow and/or interflow (with some temporary containment of water in depressional areas), but the outflow can be in the form of diffuse or concentrated surface flow. • Infiltration and evaporation from unchannelled valley-bottom wetlands can be significant, particularly if there are a number of small depressions within the wetland area.
<p>Slope</p> <ul style="list-style-type: none"> • An inclined stretch of ground that is not part of a valley floor, which is typically located on the side of a mountain, hill or valley (includes scarp slopes, mid-slopes and foot-slopes). • Slopes are considered to be those areas where the • gradient is steeper than that associated with the Lowland or Upland Floodplain Zones (i.e.gradient ≥ 0.001 or 1:1000). 	<p>Hillslope seep</p> <ul style="list-style-type: none"> • A wetland area located on (gently to steeply) sloping land, which is dominated by the colluvial (i.e. gravity-driven), unidirectional movement of material down-slope. • Water inputs are primarily from groundwater or precipitation that that enters the wetland from an up-slope direction in the form of subsurface flow. • Water movement through the wetland is mainly in the form of interflow, with diffuse overland flow ('sheetwash') often being significant during and after rainfall events. • Water leaves a 'hillslope seep with channelled outflow' mostly by means of concentrated surface flow, whereas water leaves a 'hillslope seep without channelled outflow' by means of a combination of diffuse surface flow, interflow, evaporation and infiltration.

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

Watercourses

A number of watercourses have been identified to occur within the boundaries of the project area. This includes Phufane river (non-perennial) and associated wetlands, therefore, these watercourses may be regarded as sensitive ecological environments due to the expected unique characteristics thereof when compared to the general characteristics of the remainder of the project area. These watercourses will be protected and avoided by not conducting any prospecting activities within 100 m from rivers and within 500 m from wetlands.

Fauna

Fauna will be disturbed by the prospecting activities hence will require remediation and management. Should it be established during commencement of prospecting activities that any type of fauna will be affected, such will be protected based on the severity of the potential threat.

Flora

Flora will be disturbed by the prospecting activities hence will require remediation and management. All the disturbed areas will be rehabilitated to match their original state as closely as possible by re-vegetation.

Soil

Soil will be disturbed by the prospecting activities hence will require remediation and management. All the disturbed areas will be rehabilitated to match their original state as closely as possible by covering all exposed areas with appropriate vegetation.

Topography

The topography might be disturbed by the prospecting activities (trenching and pitting) hence will require remediation and management. All the disturbed areas will be rehabilitated to their original state possible by properly backfilling all diggings.

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

- Environmental features

See Figure 7.

See Section 1.1 for full descriptions of environmental features identified on site.

- Land use features

See Figure 7, Figure 8 and Figure 9.

See Section 1.1 for full descriptions of current land use features identified on site.

- Cultural/heritage features

No cultural/heritage features are known at this stage. The project has been registered with SAHRA to determine if there are any sites of archaeological or heritage significance. The local community will also be engaged in identification of such resources before prospecting activities commence.

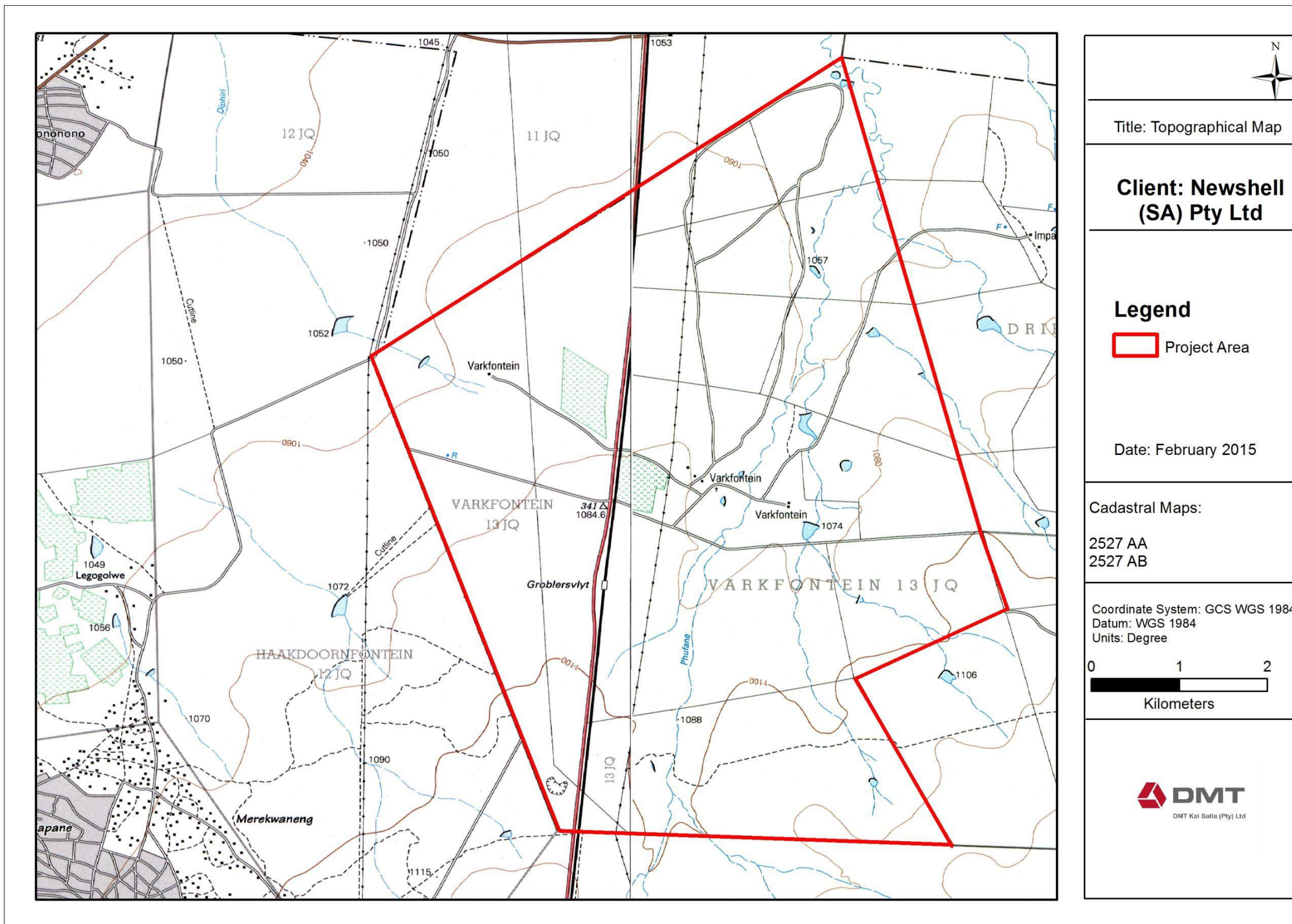


Figure 7: Location of environmental and land use features.

Map Reference

National Freeway; National Route.....	
Arterial Route.....	
Main Road.....	
Secondary Road; Bench Mark.....	
Other Road; Bridge.....	
Track and Hiking Trail.....	
Railway; Station or Siding.....	
Other Railway; Tunnel.....	
Embankment; Cutting.....	
Power Line.....	
Built-up Area (High, Low Density).....	
Buildings; Ruin.....	
Post Office; Police Station; Store.....	•P •PS •W
Place of Worship; School; Hotel.....	•K •S •H
Fence; Wall.....	
Windpump; Monument.....	
Communication Tower.....	
Mine Dump; Excavation.....	
Trigonometrical Station; Marine Beacon.....	
Lighthouse and Marine Light.....	
Cemetery; Grave.....	
International Boundary and Beacon.....	
Provincial Boundary.....	
Protected Area.....	
Perennial River.....	
Perennial Water.....	
Non-perennial River.....	
Non-Perennial Water.....	
Dry Water Course.....	
Dry Pan.....	
Marsh and Vlei.....	
Pipeline (above ground).....	
Water Tower; Reservoir; Water Point.....	•WT •R •F
Coastal Rocks.....	
Prominent Rock Outcrop.....	
Erosion; Sand.....	
Woodland.....	
Cultivated Land.....	
Orchard or Vineyard.....	
Recreation Ground.....	
Row of Trees.....	

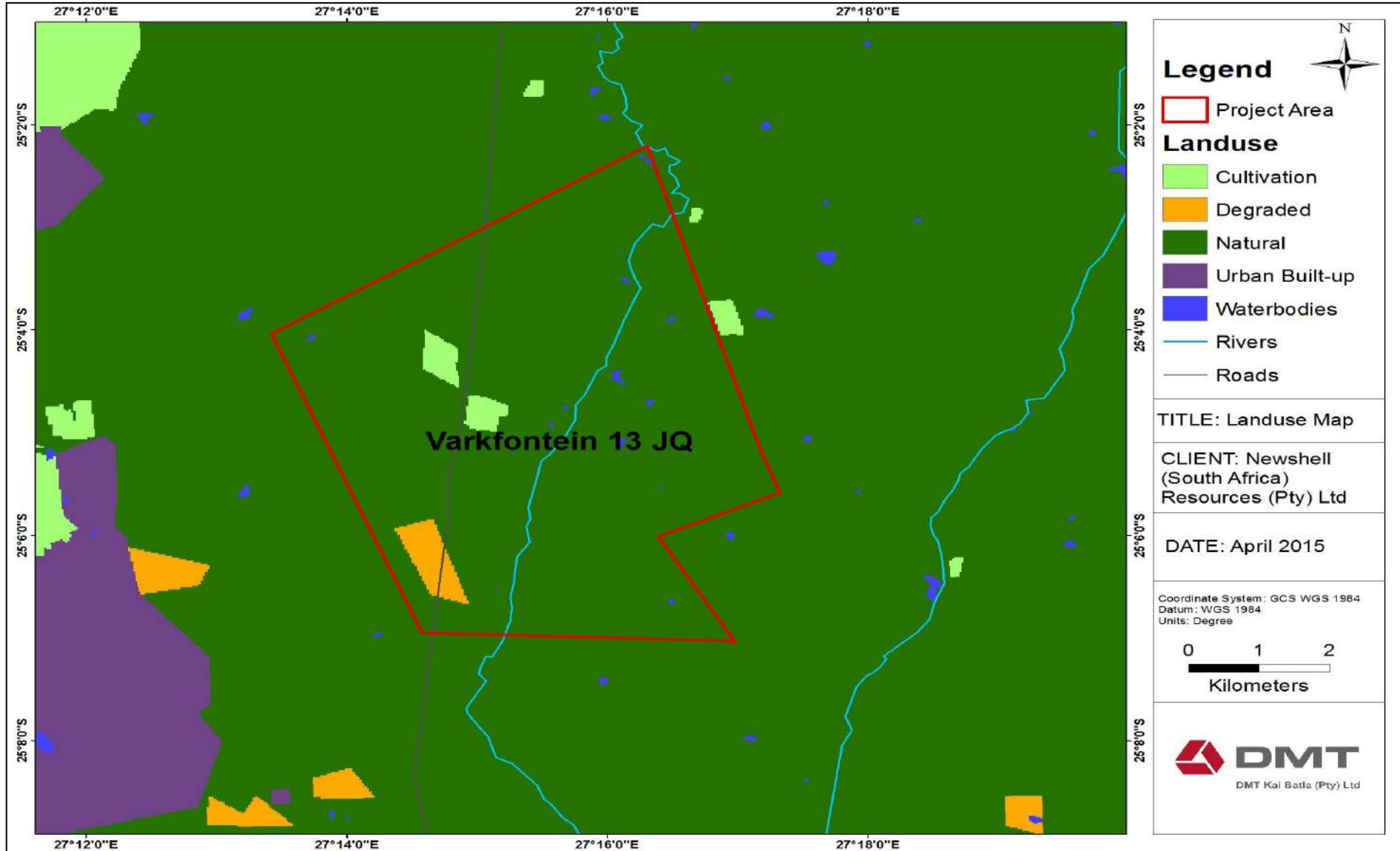


Figure 8: Map showing land use of the project area.

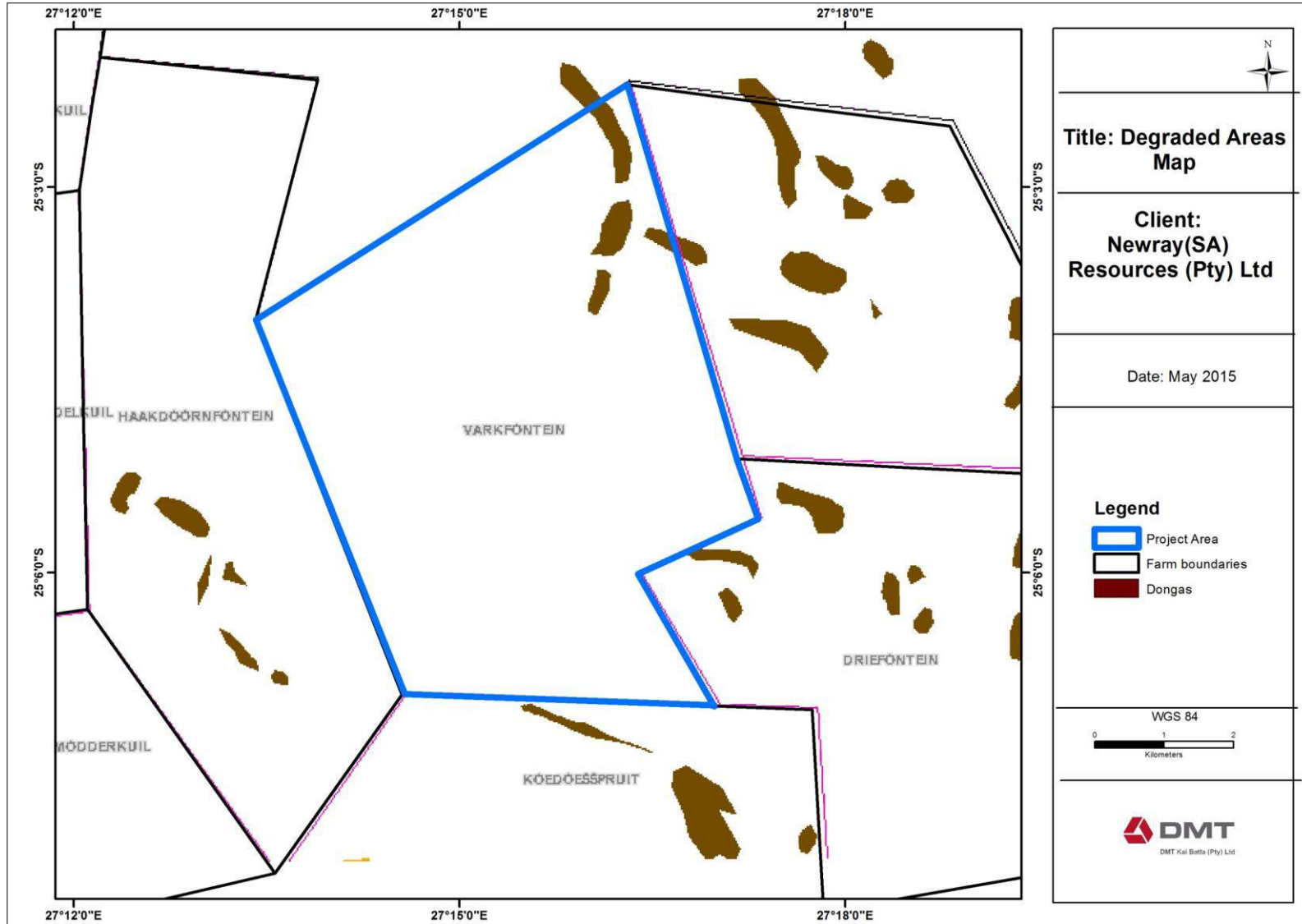


Figure 9: Map showing degraded parts of the project area.

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.

The landowners and identified interested and affected parties were notified of the proposed project, and were offered an opportunity to forward/ raise their comments regarding the project.

The following is a description of the public consultation process undertaken:

- Interested and Affected Parties (I&APs) were identified and an I&AP register was generated. The identified I&APs included:
 - Communities near the project area: Tlapane, Maeranang, Manamakgotheng, Mononono, Merekwaneng.
 - Traditional Authority: Bakgatla-Ba-Kgafela Traditional Administration (BBKTA)
 - Government Departments, organs of state, agencies and institutions:
 - SANRAL SOC Ltd
 - Transnet Freight Rail
 - Eskom
 - Department of Mineral Resources-North West
 - Department of Rural Development and Land Reform
 - Department of Water and Sanitation
 - Department of Agriculture
 - South African Heritage Resources Agency (SAHRA)
 - South Africa National Parks
 - Bakgatla-Ba-Kgafela Traditional Administration (BBKTA)
 - Moses Kotane Local Municipality
 - Bojanala Platinum District Municipality
- A Background Information Letter (BID) was compiled containing information on the proposed project. The BID was circulated to all identified I&APs along with a returnable comments register (This was conducted through registered mail and email).
- A newspaper advert detailing the proposed project was published on the 24th April 2015 in the Platinum Weekly Newspaper. The public was requested the public to register as I&APs and forward comments.
- A meeting with BBKTA was held on 14 April 2015.
- Site notices could not be placed due to the pending meeting with the Kgosis. The meeting scheduled was to be scheduled by Kgosi Pilane. To date, Kgosi Pilane has been unavailable due to other commitments. Once the meeting is executed, site notices together with a public meeting will follow.

2. REGULATION 52 (2) (B): ASSESSMENT OF THE POTENTIAL IMPACTS OF THE PROPOSED PROSPECTING OR MINING OPERATION ON THE ENVIRONMENT, SOCIO- ECONOMIC CONDITIONS AND CULTURAL HERITAGE.

2.1 Description of the proposed prospecting or mining operation.

2.1.1 List of all the main prospecting activities (e.g. access roads, topsoil storage sites and any other basic prospecting design features).

See Table 3 for all prospecting activities to be undertaken.

- **Planning and Construction Phase**

- Access roads
- Site camp

- **Operational Phase**

- Drilling pads
- Sumps
- Trenches
- Pits
- Topsoil storage site

- **Decommissioning Phase**

- Rehabilitation

2.1.1 Plan of the main activities with dimensions.

- The drill holes depths will vary between 50 metres and 250 metres although 150 metres per hole is planned on average.
- The layout of the proposed boreholes will depend on the results obtained from desktop studies, research and field mapping.
- The typical layout of a drilling site is presented as Figure 10.
- Initially about 5 percussion boreholes are planned to be drilled. This will be followed by diamond cored holes on 2 km grid, then on a 1 km grid, and finally to a 250-500 m grid.
- Length of the trenches could vary between 10 – 100 m.
- Pits, if required, will have a much smaller footprint (approximately 2 m x 2 m) and will likely be dug manually or with an excavator.

Table 3: Prospecting phases.

Phase	Activity (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required (refers to the competent personnel that will be employed to achieve the required results)	Timeframe (in months) for the activity)	Outcome (What is the expected deliverable, E.g. Geological report, analytical results, feasibility study, etc.)	What technical expert Will sign off on the outcome? (e.g. geologist, mining engineer, surveyor, economist, etc.)
Phase 1: Project Examination	Desktop studies <ul style="list-style-type: none"> • Site preparation. • Preliminary field mapping 	Geologist	1-6 Months	Identification of target areas. Readiness for prospecting	Geologist
Phase 2: Reconnaissance Exploration	Detailed field mapping <ul style="list-style-type: none"> • Geophysical (e.g. Magnetics) Survey • 5 NQ boreholes average depth of 150m, to test for the mineralization occurrence. • Logging and sampling of the boreholes • Consolidation of results and report writing • Assessment and target selection for the next phase 	Geologist Drilling Contractor	7-12 Months	Identification of target areas Detailed geological report on the sidewall profiles, volumes, average grades and the locality. Analytical Results	Geologist
Phase 3: Outline Drilling	Wide-spaced drilling and sampling to determine the distribution and lateral extent of mineralization established in the previous drilling phase (15 NQ holes averaging 150m at > 1 km spacing) <ul style="list-style-type: none"> • Detailed geological logging and sampling of the drill cores. • Analyses of the core samples 	Geologist Mineral economist Environmentalist	13-24 Months	Borehole core Delineate ore body Geological report Analytical results	Geologist

Phase	Activity (what are the activities that are planned to achieve optimal prospecting)	Skill(s) required (refers to the competent personnel that will be employed to achieve the required results)	Timeframe (in months) for the activity)	Outcome (What is the expected deliverable, E.g. Geological report, analytical results, feasibility study, etc.)	What technical expert Will sign off on the outcome? (e.g. geologist, mining engineer, surveyor, economist, etc.)
	<ul style="list-style-type: none"> • Construction of preliminary geological and resource model. • Consolidation of exploration results and report writing 				
Phase 4: Infill Drilling	<ul style="list-style-type: none"> • Closer spaced drilling and sampling to increase the resource status in a selected portion(s) of the area (10 NQ holes averaging 150m at ~500m spacing) • Analyses of the drill core samples • Metallurgical & Geotechnical test work • Update preliminary geological model. 	Geologist Drilling contractor Metallurgical engineer Geotechnical engineer	25-36 Months	Refine limits and structure of ore body Geological report Analytical results	Geologist
Phase 5: Resource Drilling	Detailed drilling and target infill drilling to confirm mineable resource	Geologist Drilling contractor	37-48 Months	Reserve area delineation Build mining model Competent person's report	Geologist
Phase 6: Pre-Feasibility and Feasibility Studies	Reserve drilling <ul style="list-style-type: none"> • Bulk sampling • Trial mining • Pilot plant test 	Geologist Metallurgist	48-60 Months	Mining feasibility report Final geological modelling report	Geologist

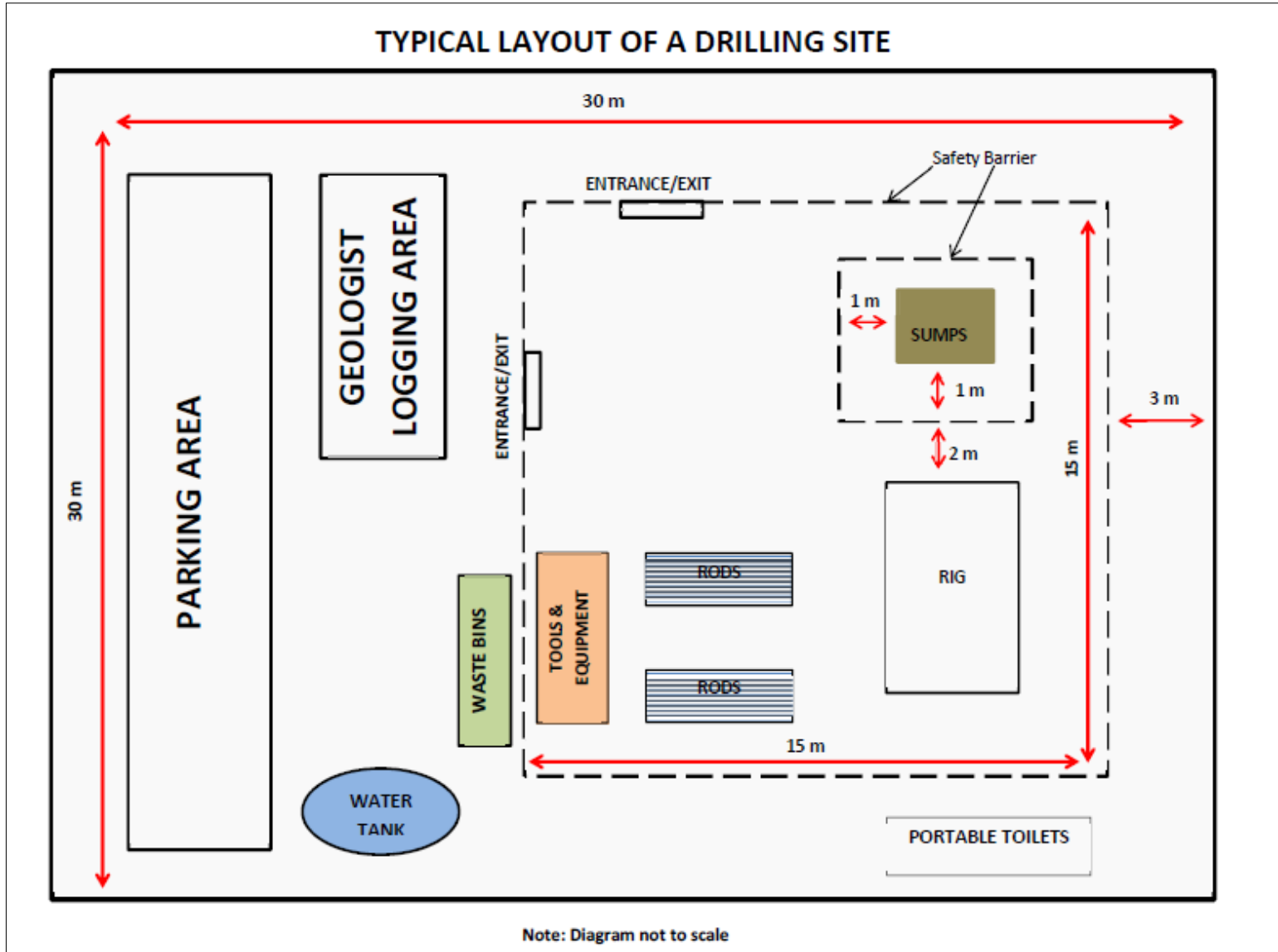


Figure 10: Typical layout of a drilling site.

2.1.2 Description of construction, operational, and decommissioning phases.

- **Construction Phase**

The construction phase will involve the establishment of drilling sites. This will comprise of moving of the drilling equipment to site, creating sumps, clearing of the drilling pads and clearing of access roads if necessary. It is envisaged that clearing of site for access will include removal of large rocks and the disturbance of obstructing vegetation. Such access roads may also require 'light' grading to allow the movement of surface mobile vehicles. The existing tracks on site will be used wherever possible to minimize clearing of the vegetation cover.

- **Operational Phase**

The operational phase will be conducted in six phases.

Phase 1: Project Examination

The aim of this phase will be to identify target areas and determine the readiness for prospecting. The phase will be conducted in the following manner:

Desktop study: Desktop study will be conducted through comprehensive review of published and unpublished work from various data sources.

Preliminary field mapping: Mapping will be conducted such that accurate and meaningful geological data may be derived from it and to communicate information gathered from the desktop study with mapping results

Site preparation: The site will be prepared for drilling activities.

The deliverable of this stage will be a report, making recommendations regarding further investigations of the mineralized areas.

Phase 2: Reconnaissance Exploration

Detailed field mapping, geophysical survey and drilling of 5 NQ, boreholes with an average depth of 150 m will be conducted to test for the mineralization occurrence. The drill core will be logged and sampled. This phase will result in the identification of target areas, detailed geological report on the sidewall profiles, volumes, average grades and the locality of the mineralization.

Phase 3: Outline drilling

15 NQ widespread core boreholes averaging 150 m at >1 km spacing will be drilled to determine the distribution and lateral extent of mineralization established in Phase 2. The drill core will be logged and sampled; and the samples will be analysed in the laboratory. Subsequent to sample analysis, a preliminary resource model will be compiled and report produced.

Phase 4: Infill drilling

10 NQ closer spaced core boreholes averaging 150 m at approximately 500 m spacing will be drilled and sampled to refine limits and structure of ore body and to increase the resource status in a selected portion(s) of the project area. Metallurgical and geotechnical test work will be conducted on the sampled core. The geological model will then be updated and a geological report will be compiled.

Phase 5: Resource drilling

Detailed drilling and target infill drilling will be conducted to confirm mineable resource. The number of boreholes to be drilled will depend of the results of the previous stages. This phase will result in reserve area delineation, build of mining model and Competent Person's report.

Phase 6: Pre-feasibility and feasibility studies

Reserve drilling, bulk sampling, trial mining and pilot plant test will be conducted to determine the feasibility of the prospecting project. The number of boreholes to be drilled will depend of the

results of the previous stages. This phase will result in compilation of a mining feasibility report and final geological modelling report.

Note: It is envisaged that trenching, pitting and bulk sampling might be conducted depending on indications from mapping and/or early stage drilling results.

Trenches: If required, will be dug with an excavator up to 3 metres below ground level to intersect the rock outcrop. The length of the trenches could vary between 10 to 100 m.

Pits: If required, will have a much smaller footprint (approximately 2 m x 2 m) and will likely be dug manually or with an excavator.

Bulk Sampling: This is envisaged to occur during the advanced stages of prospecting. The type and size of for example, box-cut will largely depend on the results of the prospecting activities.

- **Decommissioning Phase**

The decommissioning phase will only commence once all invasive prospecting activities have been completed and the site is rehabilitated. All drilling equipment including drill bits, fuel tanks, water tanks; waste bins; portable toilets; drill core will be removed from site. All boreholes will be capped and marked, all trenches and pits dug will be backfilling and profiling rehabilitation of the disturbed areas will take place.

Newshell (South Africa) Resources (Pty) Ltd will apply for a Mining Right should the findings of the prospecting activities prove feasible. However, should the outcome of the prospecting activities not prove feasible Newshell (South Africa) Resources (Pty) Ltd will apply for a closure certificate.

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

It should be noted that the detailed prospecting works programme as it relates to the location and extent of bulk sampling and drilling can only be determined after the preceding phases of the prospecting works programme has been completed.

According to Listing Notice 1: List of activities and competent authorities identified in terms of Sections 24(2) and 24 D of the National Environmental Management Act, 1998 (Act no. 107 of 1998) of Government Gazette no 38282, No. R. 98 the following activities presented in Table 4 are applicable according to NEMA EIA regulations.

Table 4: Listed activities in terms of NEMA EIA regulations.

Activity 20	Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).
Activity 22	The decommissioning of any activity requiring (i) a closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002); or (ii) a prospecting right, mining right, mining permit, production right or exploration right, where the throughput of the activity has reduced by 90% or more over a period of 5 years excluding where the competent authority has in writing agreed that such reduction in throughput does not constitute closure.

2.2 Identification of potential impacts.

(Refer to the guideline)

2.2.1 Potential impacts per activity and listed activities.

Table 5: Potential impacts per activity and listed activities.

Impacted Environment	Impact	Status of impact
PLANNING AND CONSTRUCTION PHASE		
Activity: Site visits and moving of equipment to site		
Sub activity: Moving vehicles		
Fauna	Loss of food, nest sites and refugia	Negative
	Potential damage to or destruction of sensitive faunal habitats	Negative
Flora	Loss of biodiversity	Negative
Noise	Increased noise levels	Negative
Air quality	Dust generation	Negative
	Emissions from vehicles	Negative
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative
	Potential disruption to grave sites	Negative
Soil	Potential compaction of soil	Negative
	Potential hydrocarbon contamination	Negative
Surface water	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	Negative
Traffic & safety	Road degradation	Negative
	Increased potential for road incidences	Negative
Activity: Construction of access roads and site camp		
Sub activity: Truck and heavy machinery operations		
Air quality	Dust generation	Negative
	Emissions	Negative
Groundwater	Potential hydrocarbon contamination from leaks or spills leeching into the water table	Negative
Noise	Increased noise levels	Negative
Soils	Potential compaction of soils in neighbouring areas	Negative
	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	Negative
Surface water	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	Negative
Traffic & safety	Increased potential for road incidences	Negative
	Road degradation	Negative
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative
	Potential disruption to grave sites	Negative
Activity: Clearing of drilling pads and creation of sumps		
Sub activity: Removal of vegetation		
Air quality	Dust generation	Negative
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative
	Potential disruption to grave sites	Negative
Fauna	Loss of habitat, refuge and food for animals	Negative
Flora	Loss of biodiversity	Negative
Noise	Increased noise levels	Negative
Soils	Potential for erosion, loss of soil characteristics, compaction of soil & soil degradation through stockpiling	Negative
Surface water	Potential silt-loading of drainage lines and downstream water bodies	Negative
Activity: Erection of portable toilets		
Sub activity: Erection of toilets		
Noise	Increased noise levels	Negative
Visual aspect	Deterioration in visual aesthetics of the area	Negative
Fauna	Loss of habitat, refuge and food for animals	Negative
Flora	Loss of biodiversity	Negative
Soil	Potential for erosion, loss of soil characteristics, compaction of soil & soil degradation	Negative

Impacted Environment	Impact	Status of impact
Activity: Installation of mobile lightening		
Sub activity: Erection of mobile lighting		
Visual aspect	Deterioration in visual aesthetics of the area	Negative
OPERATIONAL PHASE		
Activity: Drilling		
Sub activity : Drilling		
Air quality	Dust generation	Negative
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative
	Potential disruption to grave sites	Negative
Groundwater	Potential hydrocarbon contamination leeching into the water table through the borehole.	Negative
Fauna	Loss of food, nest sites and refugia	Negative
	Potential damage to or destruction of sensitive faunal habitats: Pans & watering points	Negative
Flora	Loss of biodiversity	Negative
Noise	Increased noise levels	Negative
Soils	Potential compaction of soils in neighbouring areas	Negative
	Potential hydrocarbon contamination to soils	Negative
Surface water	Potential hydrocarbon contamination which may reach downstream surface water bodies	Negative
Traffic & safety	Road degradation	Negative
Traffic & safety	Increased potential for road incidences	Negative
Sub activity: Lighting		
Fauna	Impact to nocturnal insects and their predators and other nocturnal animals.	Negative
Visual aspect	Deterioration in visual aesthetics of the area	Negative
Activity: Trenching and sampling		
Air quality	Dust generation	Negative
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative
	Potential disruption to grave sites	Negative
Fauna	Loss of food, nest sites and refugia	Negative
	Potential damage to or destruction of sensitive faunal habitats: Pans & watering points	Negative
Flora	Loss of biodiversity	Negative
Noise	Increased noise levels	Negative
Soils	Potential compaction of soils in neighbouring areas	Negative
	Potential hydrocarbon contamination to soils	Negative
Surface water	Potential hydrocarbon contamination which may reach downstream surface water bodies	Negative
Activity: Waste generation		
Sub activity: Domestic and industrial waste generation		
Fauna	Potential harm through littering	Negative
Groundwater	Potential contamination through littering	Negative
Soils	Potential contamination through littering	Negative
Surface water	Potential contamination through littering	Negative
Visual aspect	Loss of and disturbance to surface archaeological sites	Negative
Activity: General		
Sub activity: Creation of jobs		
Social	Potential for more employment	Positive
	Multiplier effect - improved livelihoods	Positive
DECOMMISSIONING PHASE		
Activity: Rehabilitation of access roads and drilling site		
Sub activity: Truck and heavy machinery operations		
Air quality	Dust generation	Negative
	Emissions	Negative
Groundwater	Potential hydrocarbon contamination from leaks or spills leeching into the water table	Negative
Noise	Increased noise levels	Negative
Soils	Potential compaction of soils in neighbouring areas	Negative
	Potential hydrocarbon contamination from leaks or spills to soils	Negative
Surface water	Potential hydrocarbon contamination from leaks or spills which may	Negative

Impacted Environment	Impact	Status of impact
	reach downstream surface water bodies	
Traffic & safety	Increased potential for road incidences	Negative
	Road degradation	Negative
Sub activity: Ripping of access roads		
Noise	Increased noise levels	Negative
Visual Aspect	Altered aesthetics	Positive
Sub activity: Re-vegetation		
Flora	Reintroduction of vegetation in rehabilitation	Positive
Fauna	Reintroduction of fauna attracted to flora to the area	Positive
Soils	Soils replaced and ameliorated	Positive
Surface water	Re-vegetation of disturbed areas reduces risk of silt loading on downstream water bodies	Positive
Topography	Re-contouring of area for free surface water drainage	Positive
Visual Aspect	Improved aesthetics through rehabilitation	Positive
Sub activity: Contouring for correct elevation and topography		
Air quality	Dust generation	Negative
	Emissions	Negative
Soils	Potential soil compaction	Negative
Topography	Re-contouring of area for free surface water drainage	Positive
Sub activity: Profiling of all area		
Topography	Re-contouring of area for free surface water drainage	Positive
Surface water	Free drainage resorted to area	Positive
	Large area of surface water runoff return to catchment	Positive
Sub activity: Seeding with local indigenous species		
Fauna	New habitat available to fauna in the area and reduced activity should result in influx of animals to the area	Negative
Flora	Area re-vegetated with indigenous plants	Positive
	Alien invasive encroachment	Negative

2.2.2 Potential cumulative impacts.

Table 6: Potential cumulative impacts.

Aspect	Impacts	Detailed Description
Atmosphere	Release of greenhouse gas emissions	The release of greenhouse gasses and other contaminants to the atmosphere is expected as a result of land based vehicle activity. The clearing of vegetation negatively affects carbon sequestration efficiency and increase emissions resulting from decomposition. These impacts are regarded as insignificant in terms of contribution. The risks are recognised as a cumulative impact.
Soil	Loss of natural resource (topsoil)	The loss of topsoil as a natural resource due to contamination and erosion will negatively affect land capability.
Surface water	Surface water pollution	Surface water quality impacts will extend beyond the boundary of the site if not managed appropriately. The Harts River drains the majority of the property and this river is already regarded to have poor water quality which in turn affects the agricultural sector highly dependent on this surface water resource.
Groundwater	Groundwater pollution	Groundwater contamination is regarded as a cumulative impact. Regionally there is a high dependency on groundwater resources and all activities which may impact on ground water resources are regarded as significant.
Biodiversity (Flora and fauna)	Loss of biodiversity and disruption of existing ecosystem functioning	The cumulative impacts relate to land transformation resulting in the loss of habitat.
Visual	Visual disturbance and change of landscape character.	The cumulative impacts relate to visual disturbance is regarded to impact the regional "sense of place".
Traffic and safety	Increased traffic	The increase in traffic flow may have an impact on local, regional and national roads in the area.

2.2.3 Potential impact on heritage resources.

No heritage resources are known at this stage. The project has been registered with SAHRA to determine if there are any sites of archaeological or heritage significance. The local community will also be engaged in identification of such resources before prospecting activities commence.

Should heritage resources be located on site, prospecting activities will be conducted such that these resources are not negatively impacted. The general potential impacts on heritage resources are listed in Table 7.

Table 7: Potential impact on heritage resources.

Impacted Environment	Impact	Status of impact
PLANNING AND CONSTRUCTION PHASE		
Activity: Site visits and moving of equipment to site		
Sub activity: Moving vehicles		
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative
	Potential disruption to grave sites	Negative
Activity: Construction of access roads and site camp		
Sub activity: Truck and heavy machinery operations		
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative
	Potential disruption to grave sites	Negative
Activity: Clearing of drilling pads and creation of sumps		
Sub activity: Removal of vegetation		
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative
	Potential disruption to grave sites	Negative

2.2.4 Potential impacts on communities, individuals or competing land uses in close proximity. (If no such impacts are identified this must be specifically stated together with a clear explanation why this is not the case.)

The only competing land use in close proximity of the project area is for residential purposes. The only potential impact to these areas is the temporary limited dust and noise created during prospecting.

The communities that reside near the project area include Tlapane, Maeranang, Manamakgotheng, Mononono, Merkwang. These communities could be impacted both negatively and positively in that employment opportunities will arise from the proposed prospecting operation, there will be an influx of jobseekers and social integration will occur.

Employment creation: Jobs will be created during prospecting. This impact will typically be limited to the unskilled portion of the communities. This impact is anticipated to be *high and positive*.

Influx of job seekers: As prospecting activities require a skilled work force. The workmanship required may not necessarily be available from the local communities and as a result, skills would be sourced elsewhere. This could have an impact on the social structures present in the local communities for the duration of the prospecting activities. This impact can be positive in the light that it allows the injection of additional income in the area.

Social integration: Like any other development, this project would require employees during the prospecting phase. Due to their unique situation, workers engage in behaviours that makes them vulnerable, such as risky sexual behaviour (e.g. unprotected sex) and destructive behaviour (e.g. alcohol abuse, damaging the environment), which could be explained by their migratory status. When separated from their homes, they are also distanced from traditional norms, prevailing cultural traditions and support systems that normally regulate behaviour within a stable community. Research also seems to indicate that workers might be more at risk of contracting HIV from members of local communities, as opposed to transmitting the infection to community members. All the development proposals are anticipated to have a similar significance with respect to this impact.

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

The landowners and identified interested and affected parties were notified by means of registered letters, emails, newspaper notice, and background information documents.

2.2.6 Confirmation of specialist report appended.

(Refer to guideline)

No specialist studies were conducted as this is a Prospecting Right Application.

3 REGULATION 52 (2) (C): SUMMARY OF THE ASSESSMENT OF THE SIGNIFICANCE OF THE POTENTIAL IMPACTS AND THE PROPOSED MITIGATION MEASURES TO MINIMISE ADVERSE IMPACTS.

3.1 Assessment of the significance of the potential impacts.

3.1.1 Criteria of assigning significance to potential impacts.

Environmental Impact Assessment (EIA) Criteria

Methodology for Assessing the Impacts

The Environmental impact assessment addresses the actions of the development of the proposed activity during the construction, the operational and the decommissioning phase and assesses the significance of the impact on the environment. The impact will then be described under the headings presented in Table 8:

Table 8: Criteria of assigning significance to potential impacts.

The status of the impact	
Positive	A benefit to the holistic environment
Negative	A cost to the holistic environment
Neutral	No cost or benefit

The effect (severe or beneficial) of the impact		
Score	Severe/beneficial effect	Description
1	Slight	Little effect - negligible disturbance/benefit
2	Slight to moderate	Effects observable- environmental impacts reversible with time
3	Moderate	Effects observable- impacts reversible with rehabilitation
4	Moderate to high	Extensive effects- irreversible alteration to the environment
5	High	Extensive permanent effects with irreversible alteration

The extent of the impact		
Score	Extent	Description
1	Site specific	Within the site boundary
2	Local	Affects immediate surrounding areas
3	Regional	Extends substantially beyond the site boundary
4	Provincial	Extends to almost entire province or larger region
5	National	Affects country or possibly world

The duration of the impact		
Score	Duration	Description
1	Short term	Less than 2 years
2	Short to medium term	2 – 5 years
3	Medium term	6 – 25 years
4	Long term	26 – 45 years
5	Permanent	46 years or more

The reversibility of the impact		
Score	Reversibility	Description
1,2	Completely reversible	Will reverse with minimal rehabilitation & negligible residual affects
3,4	Reversible	Requires mitigation and rehabilitation to ensure reversibility
5	Irreversible	Cannot be rehabilitated completely/rehabilitation not viable

The probability of the impact		
Score	Rating	Description
1	Unlikely	Less than 15% sure of an impact occurring
2	Possible	Between 15% and 40% sure of an impact occurring
3	Probable	Between 40% and 60% sure that the impact will occur
4	Highly Probable	Between 60% and 85% sure that the impact will occur
5	Definite	Over 85% sure that the impact will occur

The consequence of the impact
Consequence = Severity + Spatial Scale + Duration + Reversibility

The significance of the impact		
Significance = Consequence x Probability		
Significance	Score out of 100	Colour code
Low	1 to 20	
Moderate to Low	21 to 40	
Moderate	41 to 60	
Moderate to high	61 to 80	
High	81 to 100	

Is Mitigation possible?
Will there be any mitigation possible? Yes or No

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

Table 9: Significance assessment of potential impacts.

Impacted Environment	Impact	Status of impact	Effect of impact	Extent of impact	Duration of impact	Reversibility	Consequence	Probability	Significance before mitigation	Mitigation required?	Degree of loss of resource
PLANNING AND CONSTRUCTION PHASE											
Activity: Site visits and moving of equipment to site											
Sub activity: Moving vehicles											
Fauna	Loss of food, nest sites and refugia	Negative	2	1	1	1	5	3	15	Yes	Low
	Potential damage to or destruction of sensitive faunal habitats	Negative	2	1	1	1	5	3	15	Yes	Low
Flora	Loss of biodiversity	Negative	2	1	1	1	5	2	10	Yes	Low
Noise	Increased noise levels	Negative	2	2	1	1	6	5	30	Yes	Mod
Air quality	Dust generation	Negative	2	1	1	1	5	5	25	Yes	Low
	Emissions from vehicles	Negative	2	1	1	1	5	5	25	Yes	Low
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative	5	1	1	1	8	5	40	Yes	Mod
	Potential disruption to grave sites	Negative	5	1	1	1	8	5	40	Yes	Mod
Soil	Potential compaction of soil	Negative	2	1	1	1	5	1	5	Yes	Low
	Potential hydrocarbon contamination	Negative	2	1	1	1	5	3	15	Yes	Low
Surface water	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	Negative	3	3	1	1	8	3	24	Yes	Low
Traffic & safety	Road degradation	Negative	2	1	1	1	5	2	10	Yes	Low
	Increased potential for road incidences	Negative	2	1	1	1	5	2	10	Yes	Low
Activity: Construction of access roads and site camp											
Sub activity: Truck and heavy machinery operations											
Air quality	Dust generation	Negative	2	1	1	1	5	5	25	Yes	Low
	Emissions	Negative	2	1	1	1	5	5	25	Yes	Low
Groundwater	Potential hydrocarbon contamination from leaks or spills leeching into the water table	Negative	3	3	2	3	11	2	22	Yes	Low
Noise	Increased noise levels	Negative	2	1	1	1	5	5	25	Yes	Low
Soils	Potential compaction of soils in neighbouring areas	Negative	2	1	1	1	5	1	5	Yes	Low
	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	Negative	2	1	1	1	5	3	15	Yes	Low
Surface water	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	Negative	3	3	2	3	11	3	33	Yes	Mod

Impacted Environment	Impact	Status of impact	Effect of impact	Extent of impact	Duration of impact	Reversibility	Consequence	Probability	Significance before mitigation	Mitigation required?	Degree of loss of resource
Traffic & safety	Increased potential for road incidences	Negative	2	1	1	1	5	2	10	Yes	-
	Road degradation	Negative	2	1	1	1	5	2	10	Yes	-
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative	5	1	1	1	8	5	40	Yes	Mod
	Potential disruption to grave sites	Negative	5	1	1	1	8	5	40	Yes	Mod
Activity: Clearing of drilling pads and creation of sumps											
Sub activity: Removal of vegetation											
Air quality	Dust generation	Negative	2	1	1	1	5	5	25	Yes	Low
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative	5	1	1	1	8	5	40	Yes	Mod
	Potential disruption to grave sites	Negative	5	1	1	1	8	5	40	Yes	Mod
Fauna	Loss of habitat, refuge and food for animals	Negative	2	1	1	1	5	3	15	Yes	Low
Flora	Loss of biodiversity	Negative	2	1	1	1	5	2	10	Yes	Low
Noise	Increased noise levels	Negative	2	1	1	1	5	5	25	Yes	Low
Soils	Potential for erosion, loss of soil characteristics, compaction of soil & soil degradation through stockpiling	Negative	2	1	1	1	5	3	15	Yes	Low
Surface water	Potential silt-loading of drainage lines and downstream water bodies	Negative	3	3	2	3	11	3	33	Yes	Mod
Activity: Erection and use of portable toilets											
Sub activity: Erection of toilets											
Noise	Increased noise levels	Negative	2	1	1	1	5	5	25	Yes	Low
Visual aspect	Deterioration in visual aesthetics of the area	Negative	2	1	1	1	5	2	10	Yes	Low
Activity: Installation of mobile lighting											
Sub activity: Erection of mobile lighting											
Visual aspect	Deterioration in visual aesthetics of the area	Negative	2	1	1	1	5	3	15	Yes	Low
OPERATIONAL PHASE											
Activity: Drilling											
Air quality	Dust generation	Negative	2	1	1	1	5	5	25	Yes	Low
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative	5	1	1	1	8	5	40	Yes	Mod
	Potential disruption to grave sites	Negative	5	1	1	1	8	5	40	Yes	Mod
Groundwater	Potential hydrocarbon contamination leeching into the water table through the borehole.	Negative	3	3	1	1	8	2	16	Yes	Low
Fauna	Loss of food, nest sites and refugia	Negative	2	1	1	1	5	3	15	Yes	Low
	Potential damage to or destruction of sensitive faunal habitats: Pans & watering points	Negative	2	1	1	1	5	3	15	Yes	Low
Flora	Loss of biodiversity	Negative	2	1	1	1	5	2	10	Yes	Low

Impacted Environment	Impact	Status of impact	Effect of impact	Extent of impact	Duration of impact	Reversibility	Consequence	Probability	Significance before mitigation	Mitigation required?	Degree of loss of resource
Noise	Increased noise levels	Negative	2	1	1	1	5	5	25	Yes	Low
Soils	Potential compaction of soils in neighbouring areas	Negative	2	1	1	1	5	1	5	Yes	Low
	Potential hydrocarbon contamination to soils	Negative	2	1	1	1	5	3	15	Yes	Low
Surface water	Potential hydrocarbon contamination which may reach downstream surface water bodies	Negative	3	3	1	1	8	3	24	Yes	Low
Traffic & safety	Road degradation	Negative	2	1	1	1	5	2	10	Yes	Low
Traffic & safety	Increased potential for road incidences	Negative	2	1	1	1	5	2	10	Yes	Low
Sub activity: Lighting											
Fauna	Impact to nocturnal insects and their predators and other nocturnal animals.	Negative	2	1	1	1	5	3	15	Yes	Low
Visual aspect	Deterioration in visual aesthetics of the area	Negative	2	1	1	1	5	3	15	Yes	Low
Activity: Trenching and sampling											
Air quality	Dust generation	Negative	2	1	1	1	5	5	25	Yes	Low
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative	5	1	1	1	8	5	40	Yes	Mod
	Potential disruption to grave sites	Negative	5	1	1	1	8	5	40	Yes	Mod
Fauna	Loss of food, nest sites and refugia	Negative	3	3	1	1	8	2	16	Yes	Low
	Potential damage to or destruction of sensitive faunal habitats: Pans & watering points	Negative	2	1	1	1	5	3	15	Yes	Low
Flora	Loss of biodiversity	Negative	2	1	1	1	5	3	15	Yes	Low
Noise	Increased noise levels	Negative	2	1	1	1	5	2	10	Yes	Low
Soils	Potential compaction of soils in neighbouring areas	Negative	2	1	1	1	5	5	25	Yes	Low
	Potential hydrocarbon contamination to soils	Negative	2	1	1	1	5	1	5	Yes	Low
Surface water	Potential hydrocarbon contamination which may reach downstream surface water bodies	Negative	3	3	1	1	8	3	24	Yes	Low
Activity: Waste generation											
Sub activity: Domestic and industrial waste generation											
Fauna	Potential harm through littering	Negative	2	1	1	1	5	3	15	Yes	Low
Groundwater	Potential contamination through littering	Negative	3	3	1	1	8	2	16	Yes	Low
Soils	Potential contamination through littering	Negative	2	1	1	1	5	3	15	Yes	Low
Surface water	Potential contamination through littering	Negative	3	3	1	1	8	3	24	Yes	Low
Visual aspect	Loss of and disturbance to surface archaeological sites	Negative	2	1	1	1	5	2	10	Yes	Low
Activity: General											
Sub activity: Creation of jobs											
Social	Potential for more employment	Positive	2	2	1	1	6	4	24	Yes	Low

Impacted Environment	Impact	Status of impact	Effect of impact	Extent of impact	Duration of impact	Reversibility	Consequence	Probability	Significance before mitigation	Mitigation required?	Degree of loss of resource
	Multiplier effect - improved livelihoods	Positive	2	2	1	1	6	5	30	No	Mod
DECOMMISSIONING PHASE											
Activity: Rehabilitation of access roads and drilling site											
Sub activity: Truck and heavy machinery operations											
Air quality	Dust generation	Negative	2	1	1	1	5	5	25	Yes	Low
	Emissions	Negative	2	1	1	1	5	5	25	Yes	Low
Groundwater	Potential hydrocarbon contamination from leaks or spills leeching into the water table	Negative	3	3	2	3	11	2	22	Yes	Low
Noise	Increased noise levels	Negative	2	1	1	1	5	5	25	Yes	Low
Soils	Potential compaction of soils in neighbouring areas	Negative	2	1	1	1	5	1	5	Yes	Low
	Potential hydrocarbon contamination from leaks or spills to soils	Negative	2	1	1	1	5	5	25	Yes	Low
Surface water	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	Negative	3	3	2	3	11	3	33	Yes	Mod
Traffic & safety	Increased potential for road incidences	Negative	2	1	1	1	5	2	10	Yes	Low
	Road degradation	Negative	2	1	1	1	5	2	10	Yes	Low
Sub activity: Ripping of access roads											
Noise	Increased noise levels	Negative	2	1	1	1	5	5	25	Yes	Low
Visual Aspect	Altered aesthetics	Positive	2	1	1	1	5	5	25	Yes	Low
Sub activity: Re-vegetation											
Flora	Reintroduction of vegetation in rehabilitation	Positive	3	1	1	1	6	5	30	Yes	Mod
Fauna	Reintroduction of fauna attracted to flora to the area	Positive	3	2	1	1	7	5	35	Yes	Mod
Soils	Soils replaced and ameliorated	Positive	3	1	1	1	6	5	30	Yes	Mod
Surface water	Re-vegetation of disturbed areas reduces risk of silt loading on downstream water bodies	Positive	3	3	2	1	9	5	45	Yes	Mod
Topography	Re-contouring of area for free surface water drainage	Positive	2	1	1	1	5	5	25	Yes	Low
Sub activity: Contouring for correct elevation and topography											
Air quality	Dust generation	Negative	2	1	1	1	5	5	25	Yes	Low
	Emissions	Negative	2	1	1	1	5	5	25	Yes	Low
Soils	Potential soil compaction	Negative	2	1	1	1	5	3	15	Yes	Low
Topography	Re-contouring of area for free surface water drainage	Positive	2	1	1	1	5	2	10	Yes	Low
Sub activity: Profiling of all area											
Topography	Re-contouring of area for free surface water drainage	Positive	2	1	1	1	5	2	10	No	Low
Surface water	Free drainage resorted to area	Positive	3	3	2	1	9	5	45	Yes	Mod

Impacted Environment	Impact	Status of impact	Effect of impact	Extent of impact	Duration of impact	Reversibility	Consequence	Probability	Significance before mitigation	Mitigation required?	Degree of loss of resource
	Large area of surface water runoff return to catchment	Positive	3	3	2	1	9	5	45	Yes	Mod
Sub activity: Seeding with local indigenous species											
Fauna	New habitat available to fauna in the area and reduced activity should result in influx of animals to the area	Negative	2	1	1	1	5	3	15	Yes	Low
Flora	Area re-vegetated with indigenous plants	Positive	2	1	1	1	5	5	25	Yes	Low
	Alien invasive encroachment	Negative	2	1	1	1	5	3	15	Yes	Low

3.1.3 Assessment of potential cumulative impacts.

Table 10: Assessment of potential cumulative impacts.

Impacted Environment	Impact	Status of impact	Effect of impact	Extent of impact	Duration of impact	Reversibility	Consequence	Probability	Significance
Atmosphere	Release of greenhouse gas emissions	Negative	1	3	1	3	8	5	40
Soil	Loss of natural resource (topsoil)	Negative	3	1	1	1	6	5	30
Surface water	Surface water pollution	Negative	3	3	1	1	8	3	24
Groundwater	Groundwater pollution	Negative	5	3	1	5	14	1	14
Biodiversity (Flora and fauna)	Loss of biodiversity and disruption of existing ecosystem functioning	Negative	3	1	3	1	8	5	40
Visual	Visual disturbance and change of landscape character.	Negative	1	1	2	1	5	5	25
Traffic and safety	Increased traffic	Negative	1	3	2	1	7	5	35

3.2 Proposed mitigation measures to minimise adverse impacts.

Table 11: Proposed mitigation measures to minimise adverse impacts.

Impacted Environment	Impact	Proposed mitigation measures
Fauna	Loss of food, nest sites and refugia	Relocate larger animals with the aid of specialists. Ensure relevant permits are in place.
	Potential damage to or destruction of sensitive faunal habitats	Pans and artificial watering points must be cordoned off with at least 100 m horizontal distance buffer zones and no activity is to take place within these areas.
Flora	Loss of biodiversity	Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas.
Noise	Increased noise levels	Vehicles will be regularly serviced to ensure acceptable noise levels are not exceed.
Air quality	Dust generation	Roads will be sprayed with water regularly ,especially during times of high dust generation . Speed limits will be established on the road to minimise dust generation. All contractors will enforce speed limits.
	Emissions form vehicles	All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity.
	Potential disruption to grave sites	Should graves be observed on site during activity progress then all activity should ceased and the area demarcated as a no-go zone. A specialist will need to be consulted .
Soil	Potential compaction of soil	Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants.
	Potential hydrocarbon contamination	All vehicles will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material.
Surface water	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	All vehicles will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material.
Traffic & safety	Road degradation	All intersections with main tarred roads will be clearly signposted. drivers will be enforced to keep to set speed limits. Trucks will be road-worthy condition with reflective strips.
	Increased potential for road incidences	A fund will be set aside to maintain the serviceability of the road verge where the trucks approach or depart from the main road.

Impacted Environment	Impact	Proposed mitigation measures
Groundwater	Potential hydrocarbon contamination from leaks or spills leeching into the water table	<p>The drill rig will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material</p> <p>All vehicles will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material.</p>
Surface water	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	All vehicles will be regularly serviced to ensure they are in proper working conditions and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material.
Visual aspect	Deterioration in visual aesthetics of the area	<p>Directional lighting and soft lighting will be utilised to ensure that only areas required to be lit are lit.</p> <p>Waste generated on site should be recycled as far as possible. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality.</p>

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

- Fauna
- Flora
- Noise
- Air quality
- Soil
- Surface water
- Groundwater

3.2.2 Concomitant list of appropriate technical or management options.

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

- **Flora:** No trees or shrubs will be cut or damaged. Management will be responsibility to protect all declared exotic species. The following control methods will be used:
 - The plants will be treated with herbicide
- **Fauna:** To ensure a minimum of impact on fauna, the following management guidelines will be followed:
 - Backfilling of open excavations will be conducted
 - Operations will accommodate escape route for animals
 - No hunting will be allowed through prospecting
- **Air quality:** To limit the creation of nuisance dust, the following management guidelines will be followed:
 - Unnecessary removal of vegetation will be avoided
 - Routine spraying with water of unpaved site areas and roads will be conducted
 - Speed limits for vehicles will be set to avoid excessive dust creation and excessive deterioration of the roads
 - All cleared, disturbed or exposed areas will be re-vegetated to prevent the creation of additional dust
- **Soil:** The topsoil will be removed and stockpiled on a dedicated area. If any soil is contaminated during the life of the prospecting period, it will either be treated on site or be removed together with the contaminant and placed in acceptable containers to be removed with the industrial waste to a recognized facility or company.
- **Noise:** Working hours will be kept between sunrise and sunset as far as possible. Newshell will comply with the measures for good practice with regard to management of noise related impacts during prospecting.
- **Surface water:** The disposal of oil, grease and related industrial waste will be transported to the stores area where it will be stored in steel containers. All oil and grease will be removed on a regular basis from the operation by a registered approved contractor
- **Groundwater:** Drip pans will be placed at all points where diesel, oil or hydraulic fluid may drip.

Appendix A is a detailed Site Environmental Management Programme Newshell will implement.

3.2.3 Review the significance of the identified impacts.

(After bringing the proposed mitigation measures into consideration).

Table 12: Significance of the identified impacts. after bringing the proposed mitigation measures into consideration.

Impacted Environment	Impact	Status of impact	Effect of impact	Extent of impact	Duration of impact	Reversibility	Consequence	Probability	Significance
PLANNING AND CONSTRUCTION PHASE									
Activity: Site visits and moving of equipment to site									
Sub activity: Moving vehicles									
Fauna	Loss of food, nest sites and refugia	Negative	2	1	1	1	5	2	10
	Potential damage to or destruction of sensitive faunal habitats	Negative	2	1	1	1	5	2	10
Flora	Loss of biodiversity	Negative	2	1	1	1	5	1	5
Noise	Increased noise levels	Negative	2	2	1	1	6	4	24
Air quality	Dust generation	Negative	2	1	1	1	5	4	20
	Emissions form vehicles	Negative	2	1	1	1	5	4	20
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative	3	1	5	5	14	2	28
	Potential disruption to grave sites	Negative	2	1	1	1	5	2	10
Soil	Potential compaction of soil	Negative	2	1	1	1	5	1	5
	Potential hydrocarbon contamination	Negative	2	1	1	1	5	2	10
Surface water	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	Negative	2	2	1	1	6	2	12
Traffic & safety	Road degradation	Negative	2	1	1	1	5	1	5
	Increased potential for road incidences	Negative	2	1	1	1	5	1	5
Activity: Construction of access roads and site camp									
Sub activity: Truck and heavy machinery operations									
Air quality	Dust generation	Negative	3	1	1	1	6	3	18
	Emissions	Negative	1	1	1	1	4	4	16
Groundwater	Potential hydrocarbon contamination from leaks or spills leeching into the water table	Negative	2	1	3	3	9	1	9
Noise	Increased noise levels	Negative	2	1	1	1	5	4	20
Soils	Potential compaction of soils in neighbouring areas	Negative	1	1	1	1	4	1	4
	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	Negative	2	1	1	3	7	2	14

Surface water	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	Negative	3	2	3	1	9	1	9
Traffic & safety	Increased potential for road incidences	Negative	3	1	1	5	10	1	10
	Road degradation	Negative	3	2	1	3	9	1	9
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative	3	1	5	5	14	2	28
	Potential disruption to grave sites	Negative	2	1	1	1	5	2	10
Activity: Clearing of drilling pads and creation of sumps									
Sub activity: Removal of vegetation									
Air quality	Dust generation	Negative	2	1	1	1	5	4	20
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative	3	1	5	5	14	2	28
	Potential disruption to grave sites	Negative	2	1	1	1	5	2	10
Fauna	Loss of habitat, refuge and food for animals	Negative	2	1	1	1	5	2	10
Flora	Loss of biodiversity	Negative	2	1	1	1	5	1	5
Noise	Increased noise levels	Negative	2	1	1	1	5	4	20
Soils	Potential for erosion, loss of soil characteristics, compaction of soil & soil degradation through stockpiling	Negative	2	1	1	1	5	2	10
Surface water	Potential silt-loading of drainage lines and downstream water bodies	Negative	3	2	3	1	9	1	9
Activity: Erection and use of portable toilets									
Sub activity: Erection of toilets									
Noise	Increased noise levels	Negative	1	2	1	1	5	2	10
Visual aspect	Deterioration in visual aesthetics of the area	Negative	1	1	1	3	6	2	12
Activity: Installation of mobile lightening									
Sub activity: Erection of mobile lighting									
Visual aspect	Deterioration in visual aesthetics of the area	Negative	2	2	1	1	6	2	12
OPERATIONAL PHASE									
Activity: Drilling									
Air quality	Dust generation	Negative	2	1	1	1	5	4	20
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative	3	1	5	5	14	2	28
	Potential disruption to grave sites	Negative	2	1	1	1	5	2	10
Groundwater	Potential hydrocarbon contamination leeching into the water table through the borehole.	Negative	2	2	1	1	6	1	6
Fauna	Loss of food, nest sites and refugia	Negative	2	1	1	1	5	2	10
	Potential damage to or destruction of sensitive faunal habitats: Pans & watering points	Negative	2	1	1	1	5	2	10
Flora	Loss of biodiversity	Negative	2	1	1	1	5	1	5
Noise	Increased noise levels	Negative	2	1	1	1	5	4	20
Soils	Potential compaction of soils in neighbouring areas	Negative	2	1	1	1	5	1	5
	Potential hydrocarbon contamination to soils	Negative	2	1	1	1	5	2	10
Surface water	Potential hydrocarbon contamination which may reach downstream surface water bodies	Negative	2	2	1	1	6	2	12
Traffic & safety	Road degradation	Negative	2	1	1	1	5	1	5

Traffic & safety	Increased potential for road incidences	Negative	2	1	1	1	5	1	5
Sub activity: Lighting									
Fauna	Impact to nocturnal insects and their predators and other nocturnal animals.	Negative	2	1	1	1	5	2	10
Visual aspect	Deterioration in visual aesthetics of the area	Negative	2	1	1	1	5	2	10
Activity: Trenching and sampling									
Air quality	Dust generation	Negative	2	1	1	1	5	4	20
Archaeological & cultural sites	Loss of and disturbance to surface archaeological sites	Negative	3	1	5	5	14	2	28
	Potential disruption to grave sites	Negative	2	1	1	1	5	2	10
Fauna	Loss of food, nest sites and refugia	Negative	2	2	1	1	6	1	6
	Potential damage to or destruction of sensitive faunal habitats: Pans & watering points	Negative	2	1	1	1	5	2	10
Flora	Loss of biodiversity	Negative	2	1	1	1	5	1	5
Noise	Increased noise levels	Negative	2	1	1	1	5	4	20
Soils	Potential compaction of soils in neighbouring areas	Negative	2	1	1	1	5	1	5
	Potential hydrocarbon contamination to soils	Negative	2	1	1	1	5	2	10
Surface water	Potential hydrocarbon contamination which may reach downstream surface water bodies	Negative	2	2	1	1	6	2	12
Activity: Waste generation									
Sub activity: Domestic and industrial waste generation									
Fauna	Potential harm through littering	Negative	2	1	1	1	5	2	10
Groundwater	Potential contamination through littering	Negative	2	2	1	1	6	1	6
Soils	Potential contamination through littering	Negative	2	1	1	1	5	2	10
Surface water	Potential contamination through littering	Negative	2	2	1	1	6	2	12
Visual aspect	Loss of and disturbance to surface archaeological sites	Negative	2	2	1	3	8	2	16
Activity: General									
Sub activity: Creation of jobs									
Social	Potential for more employment	Positive	2	2	1	1	6	4	24
	Multiplier effect - improved livelihoods	Positive	2	2	1	1	6	5	30
DECOMMISSIONING PHASE									
Activity: Rehabilitation of access roads and drilling site									
Sub activity: Truck and heavy machinery operations									
Air quality	Dust generation	Negative	2	1	1	1	5	4	20
	Emissions	Negative	1	1	1	1	4	4	16
Groundwater	Potential hydrocarbon contamination from leaks or spills leeching into the water table	Negative	2	1	3	3	9	1	9
Noise	Increased noise levels	Negative	1	1	1	1	4	4	16
Soils	Potential compaction of soils in neighbouring areas	Negative	1	1	1	1	4	1	4
	Potential hydrocarbon contamination from leaks or spills to soils	Negative	2	1	1	3	7	2	14
Surface water	Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies	Negative	3	2	3	1	9	1	9
Traffic & safety	Increased potential for road incidences	Negative	3	1	1	5	10	1	10
	Road degradation	Negative	1	1	1	1	4	2	8

Sub activity: Ripping of access roads										
Noise	Increased noise levels	Negative	2	2	1	1	6	3	18	
Visual Aspect	Altered aesthetics	Positive	4	1	3	3	11	2	22	
Sub activity: Re-vegetation										
Flora	Reintroduction of vegetation in rehabilitation	Positive	4	2	4	1	11	2	22	
Fauna	Reintroduction of fauna attracted to flora to the area	Positive	1	2	4	3	10	2	20	
Soils	Soils replaced and ameliorated	Positive	4	1	3	3	11	2	22	
Surface water	Re-vegetation of disturbed areas reduces risk of silt loading on downstream water bodies	Positive	3	2	3	3	11	2	22	
Topography	Re-contouring of area for free surface water drainage	Positive	2	1	1	1	5	5	25	
Sub activity: Contouring for correct elevation and topography										
Air quality	Dust generation	Negative	2	1	1	1	5	2	10	
	Emissions	Negative	1	1	1	1	4	1	4	
Soils	Potential soil compaction	Negative	3	1	1	3	8	1	8	
Topography	Re-contouring of area for free surface water drainage	Positive	2	1	1	1	5	2	10	
Sub activity: Profiling of all area										
Topography	Re-contouring of area for free surface water drainage	Positive	2	1	1	1	5	2	10	
Surface water	Free drainage resorted to area	Positive	2	2	3	3	10	2	20	
	Large area of surface water runoff return to catchment	Positive	2	2	3	3	10	2	20	
Sub activity: Seeding with local indigenous species										
Fauna	New habitat available to fauna in the area and reduced activity should result in influx of animals to the area	Negative	1	1	1	1	4	2	8	
Flora	Area re-vegetated with indigenous plants	Positive	3	2	4	3	12	2	24	
	Alien invasive encroachment	Negative	1	1	1	1	4	1	4	

4 REGULATION 52 (2) (D): FINANCIAL PROVISION.THE APPLICANT IS REQUIRED TO-

4.1 Plans for quantum calculation purposes.

(Show the location and aerial extent of the aforesaid main mining actions, activities, or processes, for each of the construction operational and closure phases of the operation).

As previously mentioned, each phase of the prospecting activities is dependent on the success of the previous. Depending on the outcome of the Phase 1 desktop studies and Phase 2 mapping, the number of boreholes to be drilled will be determined and at this stage, it will be determined whether trenching and pitting is required. Depending on Phase 3 drilling, it will also be determined whether further drilling for Phase 4 and Phase 5 is required and if so, how many boreholes would be required. The digging , extent and location of trenches and pits will also be determined as the project progress, should need arise.

For the purposes of this report, a typical layout of a drill site (refer Figure 10) has been included to provide an understanding of the potential scale and significance of these activities.

4.2 Alignment of rehabilitation with the closure objectives.

(Describe and ensure that the rehabilitation plan is compatible with the closure objectives determined in accordance with the baseline study as prescribed).

The closure objectives of the prospecting activities will include:

- Remove all surface infrastructure
- Clear boulders from site
- Remove all waste from site
- Ensure rehabilitated areas are at appropriate elevations and have appropriate contours
- Ensure adequate topsoil placement on rehabilitated areas
- Ensure the rehabilitated areas are free draining
- Re-vegetate all rehabilitated areas as soon as possible, with area specific vegetation
- Wetland areas are not compromised or destructed
- Future public health and safety are not compromised
- The site is reversed to almost its original state
- Environmental features are not subject to physical and chemical deterioration
- The after-use of the site is beneficial and sustainable in the long term
- Any adverse socio-economic impacts are minimized
- All socio-economic benefits are maximized

Rehabilitation Plan

The rehabilitation plan shall coincide with the objectives and commitments as stipulated above. The aim of rehabilitation is to return the land disturbed by the prospecting activities to its original state, and to ensure that residual impacts after the completion of prospecting are minimal.

The rehabilitation plan shall entail removal of all generated waste, infrastructures and materials, re-vegetation of disturbed and cleared areas, rehabilitation of access roads, ensuring the growth of the existing flora and fauna and cleaning of hydrocarbon spillages.

Access roads, drilling sites, site camps, sampling sites

After prospecting operations are completed all access roads, site camp, storage areas and the drilling sites will be rehabilitated as follows:

- All material removed from the earth will be used to backfill open excavations
- Compacted areas will then be ripped and where possible, the topsoil will be returned and landscaped
- The site will be seeded, should the need arise, with a vegetation seed mix which reflects the local indigenous flora
- All infrastructure and equipment used during prospecting will be removed from site
- Upon completion of operations, all buildings, structures or objects on site will be dealt with in accordance with Regulation 44 of the Minerals and Petroleum Resources Development Act, 2002
- Long-term stability and safety: It will be the objective of management to ensure the long term stability of all rehabilitated areas. This will be conducted by monitoring of all areas until formal closure is conducted

Waste Disposal

- All waste material will be removed from site and disposed of appropriately
- No waste will be buried or burned on site
- No on-going monitoring of ground or surface water will take place, unless required by the Department of Water Affairs.

Backfilling of sumps and sample pit

- Sumps must be backfilled after the fluid has evaporated/infiltrated. Sumps should be rehabilitated by replacing the material (which was originally excavated) in the reverse (i.e. topsoil should be re-spread last).
- The sample pit will be backfilled with suitable material sources off site. Borrow pits to source such material will not be established on-site. The area is to be lined with subsoils, followed with the laying down of topsoil.
- The areas are to be re-vegetated with the appropriate seed mix.
- The areas are to be inspected on a monthly basis for a period of 6 months for the following:
 - Remove any unwanted plants and weeds.
 - Inspect for and repair soil / wind erosion features. Should engineering intervention be required to limit areas of consistent erosion (wind / water), these should be implemented timeously.
 - Confirm re-vegetation target of 45%. If the target is not achieved re-seeding will be undertaken.
 - Inspect for subsidence, and if required undertake additional backfilling, re-vegetate and monitor.

Drill Holes

- Drill hole capping will be undertaken.
- Drill hole subsidence will be monitored for a period of 6 month after permanent capping has been completed.

4.3 Quantum calculations.

(Provide a calculation of the quantum of the financial provision required to manage and rehabilitate the environment, in accordance with the guideline prescribed in terms of regulation 54 (1) in respect of each of the phases referred to).

Table 13: Quantum calculations for the proposed project area.

NEWSHELL (SA) RESOURCES (PTY)LTD		Physical Address: Block 2, 29 IMPALA ROAD, SANDTON						
Prospecting Right: 30/5/1/1/2/11617PR		email address: caroline@intlresources.com						
		Tel No: 011 050 2828						
		Fax No: 011 050 2828						
		Cell No: 071 491 7830						
#NAME?	Description	Unit	A	B	C	D	E = A*B*C*D	
Rate Component			Published Rates 2014	Quantity	MASTER RATE 6.20% (Published April 2014)	MULTIPLICATION FACTOR	Weighting Factor 1	Amount (in ZAR)
S1.2	Annual Adjustment for Average CPI Figures	CPI %	0.062	Step 4.5		Step 4.3	Step 4.4	0
1	Dismantling of processing plant and related structures (Including overland conveyors and powerlines	M3		0	R 6.82			0
2A	Demolition of steel buildings and structure	M2		0	R 95.00			0
2B	Demolition of reinforced concrete buildings and structure	M2		0	R 140.00			0
3	Rehabilitation of access road	M		1000	R 17.00	1	1.05	R 17 850.00
4A	Demolition and rehabilitation of electrified railway lines	M		0	R 165.00			0
4B	Demolition and rehabilitation of nonelectrified railway lines	M		0	R 90.00			0
5	Demolition of housing and/or administration facilities	M2			R 190.00			0
6	Opencast rehabilitation including final voids and ramps	Ha		0	R 96 700.00			0
7	Sealing of shafts, edits and inclines	M3		0	R 51.00			0
8A	Rehabilitation of overburden and spoils	Ha		0	R 66 400.00			0
8B	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt producing waste)	Ha		0	R 82 700.00			0
8C	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	Ha		0	R 240 200.00			0
9	Rehabilitation of subsided areas	Ha		0	R 55 600.00			0
10	General surface rehabilitation	Ha		3.9	R 52 600.00			0
11	River diversions	Ha		0	R 52 600.00	1	1.05	0
12	Fencing	Ha		0	R 6 000.00			0
13	Water Management	Ha		0	R 20 000.00			0
14	2 to 3 years of maintenance and aftercare	Ha		3.9	R 700.00	1	1.05	R 2 866.50
15(A)	Specialist study	Sum		0				0
15(B)	Specialist study	Sum		0				0
Subtotal 1 (Sum of items 1 to 15)								20716.5
Multiply sum of 1 - 15 by weighting factor 2 (Step 4.4)		WF2			R			
1 Preliminary and General		Add 6% of subtotal if R100, 000, 000.00						1242.99
		Add 12% of subtotal if R100, 000, 000.00						
2 Contingencies		Subtotal 2 (Add 10% of subtotal 1)						2071.65
		subtotal 1 plus sum of management and contingency subtotal 2						
		Subtotal 3						24031.14
		VAT @ 14% of Subtotal 3						3364.3596
		Grand Total (subtotal 3 plus VAT)						27395.4996

4.4 Undertaking to provide financial provision.

(Indicate that the required amount will be provided should the right be granted).

The financial provision for rehabilitation will be provided by means of bank guarantees from a reputable financial institution.

5 REGULATION 52 (2) (E): PLANNED MONITORING AND PERFORMANCE ASSESSMENT OF THE ENVIRONMENTAL MANAGEMENT PLAN.

5.1 List of identified impacts requiring monitoring programmes.

- Air quality
- Noise
- Visual aspect

5.2 Functional Requirements for Monitoring Programmes

The operations manager will conduct internal EMP compliance audit on a weekly basis. None compliance will be reported in the form of EMP checklist to the Environmental Assessment Practitioner (EAP). It is recommended that an EAP be appointed to conduct the site monitoring during the site establishment/ clearance for site camp to assess the environmental performance against the approved EMP. An Environmental Assessment Practitioner will conduct external EMP compliance audit every six months. Performance assessment report in terms of Regulation 55 of the MPRDA Regulations will be compiled.

5.3 Roles and responsibilities for the execution of monitoring programmes

The Operations Manager will be responsible for the proper execution of the monitoring programmes. The manager will ensure that the appointed EAP delivers as per the monitoring programmes requirements. The manager will also insure that all incidences are documented and rectified.

5.4 Committed Time Frames for Monitoring and Reporting

Time-frames detail the implementation schedule of management actions. The successful implementation and commencement within the timeframes is to be monitored as part of the performance assessment programme.

Monitoring time frames

- Noise monitoring – Quarterly monitoring
- Air quality monitoring - Quarterly monitoring
- Visual aspect monitoring- Daily monitoring

Reporting time frames

The results of these monitoring programmes will be compiled into annual reports submitted to the Department of Mineral Resources.

6 REGULATION 52 (2) (F): CLOSURE AND ENVIRONMENTAL OBJECTIVES.

6.1 Rehabilitation plan.

(Show the areas and aerial extent of the main prospecting activities, including the anticipated prospected area at the time of closure).

As previously mentioned, each phase of the prospecting activities is dependent on the success of the previous. Depending on the outcome of the Phase 1 desktop studies and Phase 2 mapping, the

number of boreholes to be drilled will be determined and at this stage, it will be determined whether trenching and pitting is required. Depending on Phase 3 drilling, it will also be determined whether further drilling for Phase 4 and Phase 5 is required and if so, how many boreholes would be required. The digging, extent and location of trenches and pits will also be determined as the project progresses, should need arise.

For the purposes of this report, a typical layout of a drill site (refer Figure 10) has been included to provide an understanding of the potential scale and significance of these activities.

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

Prospecting activities are to be undertaken in a manner which facilitates site rehabilitation and the restoration of existing land capabilities. The primary objectives for rehabilitation include:

- The facilitation of the re-establishment of the land use and capability to as close as reasonably to the original conditions
- Removal of all infrastructure and material introduced to site
- Removal of all wastes and their and their related disposal
- Promotion of the rapid re-establishment of natural vegetation and the restoration of site ecology.

The closure objectives of the prospecting activities will include:

- Remove all surface infrastructure
- Clear boulders from site
- Remove all waste from site
- Ensure rehabilitated areas are at appropriate elevations and have appropriate contours
- Ensure adequate topsoil placement on rehabilitated areas
- Ensure the rehabilitated areas are free draining
- Re-vegetate all rehabilitated areas as soon as possible, with area specific vegetation
- Wetland areas are not compromised or destructed
- Future public health and safety are not compromised
- The site is reversed to almost its original state
- Environmental features are not subject to physical and chemical deterioration
- The after-use of the site is beneficial and sustainable in the long term
- Any adverse socio-economic impacts are minimized
- All socio-economic benefits are maximized

The rehabilitation plan shall entail removal of all generated waste, infrastructures and materials, re-vegetation of disturbed and cleared areas, rehabilitation of access roads, ensuring the growth of the existing grasses and plants species and cleaning of spillages etc. Additional measures that will need to be put in place to allow for the successful implementation of the action plan are listed on relevant sections.

The various actions that need to be implemented, to ensure that the environmental objectives are met, are detailed in the EMP. The actions are aimed at mitigating environmental impacts and implementing rehabilitation plan.

Emergency procedures indicate the actions to be taken in the case of an environmental emergency. These refer to an event that could result in a pollution incidents or damage to biophysical or social environment. Fire fighting equipment including fire extinguishers and fire beaters are to be kept on site (at the camp site and drilling areas). The fire management plan or procedure will be drawn and erected at the site camp and drilling machine. Any plan that will be drawn and implemented on site is the spillage of fuel, oil, lubricant or any chemical substances. Spill kits are to be purchased and be kept on site in close proximity to fuel/lubricant storage areas.

6.3 Confirmation of consultation.

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

The landowners and identified interested and affected parties were notified by means of registered letters, emails, newspaper notice and background information documents.

7 REGULATION 52 (2) (G): RECORD OF THE PUBLIC PARTICIPATION AND THE RESULTS THEREOF.

7.1 Identification of interested and affected parties.

(Provide the information referred to in the guideline)

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

Tlapane, Maeranang, Manamakgotheng, Mononono, Merekwaneng.

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

The community is not the land owner.

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

The Department of Land Affairs (now Department of Rural Development and Land Reform) was identified as an interested and affected party.

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

No land claim is involved.

7.1.5 Name the Traditional Authority identified

Bakgatla-Ba-Kgafela Traditional Administration (BBKTA)

7.1.6 List the landowners identified by the applicant. (Traditional and Title Deed owners)

Title Deed landowner: State

Traditional landowner: Bakgatla-Ba-Kgafela Traditional Administration (BBKTA)

7.1.7 List the lawful occupiers of the land concerned.

Tribal community.

7.1.8 Explain whether or not other persons' (including on adjacent and non-adjacent properties) socio-economic conditions will be directly affected by the proposed prospecting or mining operation and if not, explain why not.

It is not anticipated that the proposed development will have an impact on the socio-economic conditions as the project is only a prospecting activity.

7.1.9 Name the Local Municipality.

Moses Kotane Local Municipality

7.1.10 Name the relevant Government Departments, agencies and institutions responsible for the various aspects of the environment and for infrastructure which may be affected by the proposed project.

- SANRAL SOC Ltd
- Transnet Freight Rail
- Eskom
- Department of Mineral Resources-North West
- Department of Rural Development and Land Reform
- Department of Water and Sanitation
- Department of Agriculture
- South African Heritage Resources Agency (SAHRA)
- South Africa National Parks
- Bakgatla-Ba-Kgafela Traditional Administration (BBKTA)
- Moses Kotane Local Municipality
- Bojanala Platinum District Municipality

7.1.11 Submit evidence that the landowner or lawful occupier of the land in question, and any other interested and affected parties including all those listed above, were notified.

Evidence of notification is appended (**Appendix B**).

- Newspaper advertisement
- Background Information Document
- Minutes to meeting
- Letters
- Emails

7.2 The details of the engagement process.

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

The information provided included:

Identification of applicant: Newshell (SA) Resources

Reason for the notice: Prospecting Right Application lodged with the Department of Mineral Resources, North West Province for phosphates ore, iron ore, titanium ore, magnetite ore and vanadium ore within the Magisterial District of Mankwe

Description of proposed area: The property description for the site was provided as Portions 3, 10, 12 and 13 of Farm Varkfontein 13 JQ.

Introduction of the environmental consultants: It was mentioned that DMT-Kai Batla (Pty) Ltd was appointed to undertake the environmental study and undertake the Public consultation process and prepare the Environmental Management Plan and for the prospecting right application.

General information regarding legislation governing the Prospecting Right Application

Potential impacts of prospecting

Further studies that could potentially be undertaken

Contact details for enquiries: I&APs were invited to register and send their responses, concerns and issues regarding the proposed project by fax, telephone or e-mails.

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

Table 14: List of Interested and Affected Parties consulted.

Interested and Affected Parties	Consulted
SANRAL SOC Ltd	X
Transnet Freight Rail	X
Eskom	X
Department of Mineral Resources-North West	X
Department of Rural Development and Land Reform	X
Department of Water and Sanitation	X
Department of Agriculture	X
South African Heritage Resources Agency (SAHRA)	X
South Africa National Parks	X
Bakgatla-Ba-Kgafela Traditional Administration (BBKTA)	X
Moses Kotane Local Municipality	X
Bojanala Platinum District Municipality	X

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

None

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

None

7.2.5 Other concerns raised by the aforesaid parties.

Eskom mentioned that their power lines are located within the project area. However, the official letter with their terms and conditions on the said project is still pending.

Minutes of meeting and records of consultation are appended (**Appendix B**).

7.2.6 Information regarding objections received.

No objections were received.

7.3 The manner in which the issues raised were addressed.

No issues have been raised thus far.

8 SECTION 39 (3) (C) OF THE ACT: ENVIRONMENTAL AWARENESS PLAN.

8.1 Employee communication process

(Describe how the applicant intends to inform his or her employees of any environmental risk which may result from their work).

- Newshell shall ensure that employees and contractors are adequately notified of the environmental risk, which may arise from the prospecting operations.
- Environmental awareness will be targeted at all full-time and part-time personnel on site.
- All personnel will be notified through induction programmes, whereby they will be trained and made aware of environmental obligations on the site they will work and the environmental risks associated with their work.
- Personnel will also be notified of the manner in which these risks must be dealt with to avoid pollution and minimize the degradation of the environment.
- Daily “toolbox talks” led by the operations manager will be held prior to commencing work, which will include discussions on health, safety and environmental matters.

8.2 Description of solutions to risks.

(Describe the manner in which the risk must be dealt with in order to avoid pollution or degradation of the environment).

The workforce on site will be trained on how to identify and mitigate risks on site. Potential risks and solutions are presented in Table 15. The most appropriate solutions to environmental risks will be determined in the following manner:

- Identify risk
- Analyse risk
 - Determine consequences
 - Determine likelihood
- Assess and prioritise risk
 - Determine priorities for treatment
- Treat risk
 - Eliminate
 - Reduce
 - Transfer
 - Manage
- Monitor and review

Table 15: Potential risks.

Potential risks	Potential solutions
<p>Fauna: Loss of food, nest sites and refugia</p> <p>Fauna: Potential damage to or destruction of sensitive faunal habitats</p>	<p>Relocate larger animals with the aid of specialists. Ensure relevant permits are in place.</p> <p>Pans and artificial watering points must be cordoned off with at least 100 m horizontal distance buffer zones and no activity is to take place within these areas.</p>
<p>Flora: Loss of biodiversity</p>	<p>Ensure permits are obtained to remove protected species. Relocate all protected species with aid of specialists. Only remove species in areas designated for activity and do not disturb surrounding areas.</p>
<p>Noise: Increased noise levels</p>	<p>Vehicles will be regularly serviced to ensure acceptable noise levels are not exceed.</p>
<p>Air quality: Dust generation</p> <p>Air quality: Emissions form vehicles</p>	<p>Roads will be sprayed with water regularly ,especially during times of high dust generation. Speed limits will be established on the road to minimise dust generation. All contractors will enforce speed limits.</p> <p>All vehicles will be regularly services to ensure they are in proper working condition and to reduce risk of excessive emissions</p>
<p>Archaeological & cultural sites: Loss of and disturbance to surface archaeological sites</p>	<p>Should artefacts or archaeological items be observed, then all activity should cease immediately, the area marked off and a specialists consulted prior to any further activity.</p> <p>Should graves be observed on site during activity progress then all activity should ceased and the area demarcated as a no-go zone. A specialist will need to be consulted .</p>
<p>Soil: Potential compaction of soil</p> <p>Soil: Potential hydrocarbon contamination</p>	<p>Activity should be limited to area of disturbance. Where required the compacted soils should be disked to an adequate depth and re-vegetated with indigenous plants.</p> <p>All vehicles will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material.</p>
<p>Surface water: Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies</p>	<p>All vehicles will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material.</p>
<p>Traffic & safety: Road degradation</p> <p>Traffic & safety: Increased potential for road incidences</p>	<p>All intersections with main tarred roads will be clearly signposted. drivers will be enforced to keep to set speed limits. Trucks will be road-worthy condition with reflective strips.</p> <p>A fund will be set aside to maintain the serviceability of the road verge where the trucks approach or depart from the main road.</p>
<p>Groundwater: Potential hydrocarbon contamination from leaks or spills leeching into the water table</p>	<p>The drill rig will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material</p> <p>All vehicles will be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material.</p>
<p>Surface water: Potential hydrocarbon contamination from leaks or spills which may reach downstream surface water bodies</p>	<p>All vehicles will be regularly serviced to ensure they are in proper working conditions and to reduce risk of leaks. All leaks will be cleaned up immediately using an absorbent material.</p>
<p>Visual aspect: Deterioration in visual aesthetics of the area</p>	<p>Directional lighting and soft lighting will be utilised to ensure that only areas required to be lit are lit.</p> <p>Waste generated on site should be recycled as far as possible. Recycled waste should not be stored on site for excessive periods to reduced risk of environmental contamination. Refuse bins will be placed around site to collect all non-recycle waste for disposal at the municipality.</p>

8.3 Environmental awareness training.

(Describe the general environmental awareness training and training on dealing with emergency situations and remediation measures for such emergencies).

ENVIRONMENTAL AWARENESS TRAINING PROGRAMME

Environmental awareness training will be provided to all employees and contractors appointed to work on the project before any activity commences. Thereafter, refresher training will be conducted on an annual basis. Training will also be given to all employees and contractors working on site.

The objective of environmental awareness training will be to ensure that employees on site, including contractors, are competent to perform their duties, thereby eliminating negative impacts on their safety, health and the environment.

Training Needs Analysis

Before training commences, a training needs analysis will be conducted to ensure that appropriate training and training manuals are given everyone working onsite. After the training needs have been identified, it will be the responsibility of the operations manager to ensure that personnel receive the relevant identified training and associated manuals.

Training Materials

The Environmental topics to be covered during training will include the following:

- Natural resource management
- Hazardous substance use and storage
- Incident & emergency reporting
- Oil / diesel/ petrol spill clean up
- Conservation of water
- Conservation of vegetation
- Heritage resources management
- Waste management

Emergency Situations and Remediation

The workforce will be trained on how to deal with emergencies and remediation measures for such emergencies. The following aspects will be covered in the training.

- Methods of how to identify areas where accidents and emergency situations may occur and the potential impacts
- Emergency response procedures
- Appropriate equipment and resources for attending to emergencies
- Designation of responsibilities during emergency situations
- Communication/reporting lines during emergencies
- Training schedule to ensure effective response.

All training material for presentation to personnel and contractors will be reviewed annually to ensure consistency with organizational requirements and best practice guidelines. In addition to this, annual monitoring reports, audit results and all incident reports will be reviewed, any shortcomings and non-compliance will be highlighted and management measures incorporated or improved upon within the training material.

Newshell management will assess the effectiveness of the environmental management training.

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.

(Provide a detailed explanation as to how the amount was derived)

A total estimated amount of R 42 000.00 has been calculated for the implementation of the Environmental Management Plan over the 5 year planned prospecting programme. Costs related to the appointment and / or training of an Environmental Management Officer, who will oversee the implementation of the Environmental Management Plan is not included in the costing.

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

The rehabilitation cost was included in the costing schedule presented as Table 9.1 in the Prospecting Works Programme.

Table 16: Rehabilitation costs as presented in the prospecting works programme.

Phase	Actions	Year 1	Year 2	Year 3	Year 4	Year 5
Phase 1: Project Examination		Month 1- Month 6				
Phase 2: Reconnaissance Exploration	Rehabilitation of biodiversity, access roads, soil, boreholes, waste and spill management	Month 7- Month 12 R 5 000.00				
Phase 3: Outline Drilling				Month 13- Month 24 R 10 000.00		
Phase 4: Infill Drilling	It is envisaged that rehabilitation costs will increase annually as drilling and possibly trenching and pitting occurs.				Month 25- Month 36 R 12 000.00	
Phase 5: Resource Drilling						Month 37- Month 48 R 15 000.00
Phase 6: Pre-Feasibility and Feasibility Studies						
Total: R 42 000						

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	Caroline Munyai
Identity Number	880503 0940 08 8

-END-