



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: Jacobus Johannes Duvenhage

REFERENCE NUMBER: NC30/5/1/3/2/10422 MP

ENVIRONMENTAL MANAGEMENT PLAN

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

STANDARD DIRECTIVE

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

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

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

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

Status of the cultural environment that may be affected

The proposed mining area is within an historic burrow pit and this project will therefore be a continuation of the socio-cultural aspects of the area.

Status of any heritage environment that may be affected

With regard to sites of archaeological interest most the area is already disturbed by previous mining. The possibility to unearth any fossils or artefacts is therefore zero and given the high cost of a visit to this site, no first phase paleontological assessment is deemed necessary. No other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves of victims of conflict, and cultural landscapes or viewsapes are present on the prospecting area applied for.

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

Approximately 90% of the region is used for livestock grazing and production, with the remainder comprising of vineyards and urban development. Mining will only be a temporary land use where after land use will revert back to the pre-mining land use grazing. Productivity of the land with regard to land use is very low and mining will have no impact on the productivity of the area. Most of the Northern Cape is defined as vacant or unspecified land use (Refer Map 1).

Status of any infrastructure that may be affected

Existing roads and tracks will be used and in the case of new tracks be developed it will be addressed at final closure and rehabilitation.

Status of the biophysical environment that may be affected

Topography

This region occurs within the hot, arid drainage basin of the Orange River and is characterised by a broken, rocky terrain. Altitude ranges from 350 m in the mountains to about 250m (Refer Map 2).

Soil

Orange River Nama Karoo occurs on soils derived from the ancient basement granites and gneisses of the Namaqualand Mobile Belt on the south edge of the Richtersveld Craton. Red and yellow apedal, freely draining, young soils dominate most of the area. Deep alluvial soils occur along the Orange River (Refer Map 3). The soils in the area are generally not suitable for dry land crop production therefore the pre-mining land capacity is categorized as Class III grazing land. The productivity of the area is very low at 8-10Ha/SSU.

Natural Vegetation

The complex geology and broken, rocky terrain result in a large number of distinct vegetation communities within Orange River Nama Karoo. This type tends to occur on the granite-derived soils rather than the shale-derived, clayey soils of the other Nama Karoo types. In places, the region is very rocky and possesses a "broken" topography with Quiver Tree *Aloe dichotoma*, Bushman Poison Tree *Euphorbia avasmontana* and Aggenys Milkbush *E. gregaria* normally associated with the steep slopes of the mountains and hills of the area. On the pediments, Spike-flowered Black Thorn *Acacia mellifera*, Threethorn *Rhigozum trichotomum*, Shepherd's

Tree *Boscia albitrunca* and Stink Shepherd's Tree *B. foetida* are common trees and shrubs, while Silky Bushman Grass *Stipagrostis uniplumis* often dominates the plains, especially after good summer rains. There are abundant thickets along the banks of the Orange River itself, with Wild Tamarisk *Tamarix usneoides*, Buffalo Thorn *Ziziphus mucronata* and Camel Thorn *Acacia erioloba* common along the dry river beds of the tributaries as well.

Animal Life

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

Surface Water

No drainage channels occur within the mining area and there is no dendritic system which could be disturbed. Surface water only accumulates in the excavations after exceptional good rains. Given the variability of semi-arid rainfall, the calculation of the mean annual runoff (MAR) would be of no use. The MAR is in any event very low given the low rainfall less than 250 mm per year occurring mainly in the summer months, high evaporation rates, and shallow grade of the slope toward the drainage channels and the permeability of the soils. The surface water quality (when available) is suitable for animal consumption but not for potable water. No natural wetlands exist in the area.

Groundwater

Due to the shallow nature of operations the impact on the groundwater is considered insignificant. The absence of a waste handling program can however have a significant impact through oil and fuel spills and soil contamination.

Air Quality

Existing pre-mining dust is generated through the following:

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

Dust generation off un-surfaced roadways on site.

Given the surrounding extent of semi-desert, dust generation is high under windy conditions (dust storm) however under normal conditions no extreme dust conditions are noted on site.

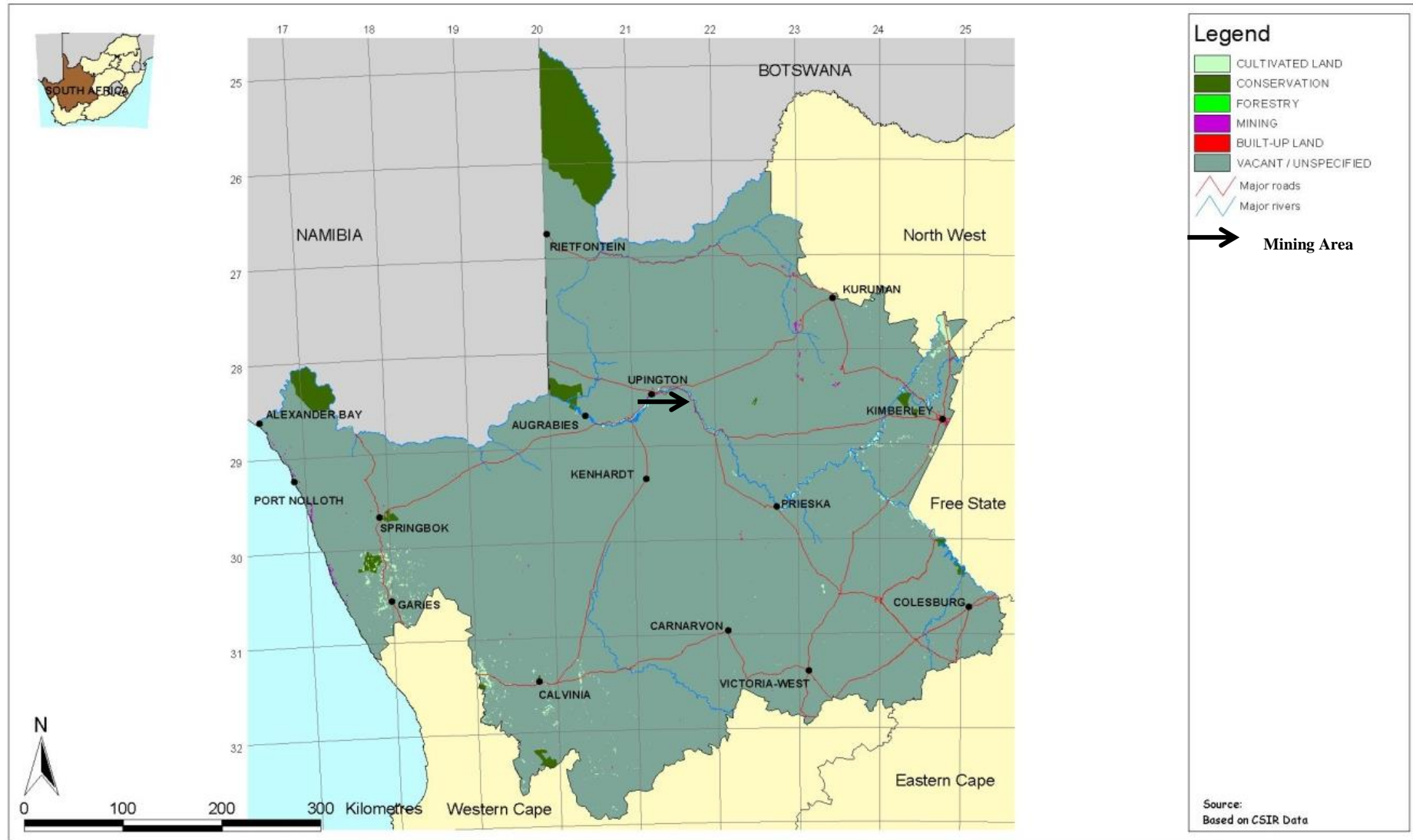
Mining activities will take place in a very remote area and dust generation will be limited to a small radius around the operation. If the dust however becomes a nuisance or health risk, dust will be suppressed with spraying water and/or dust-allaying agents.

Noise

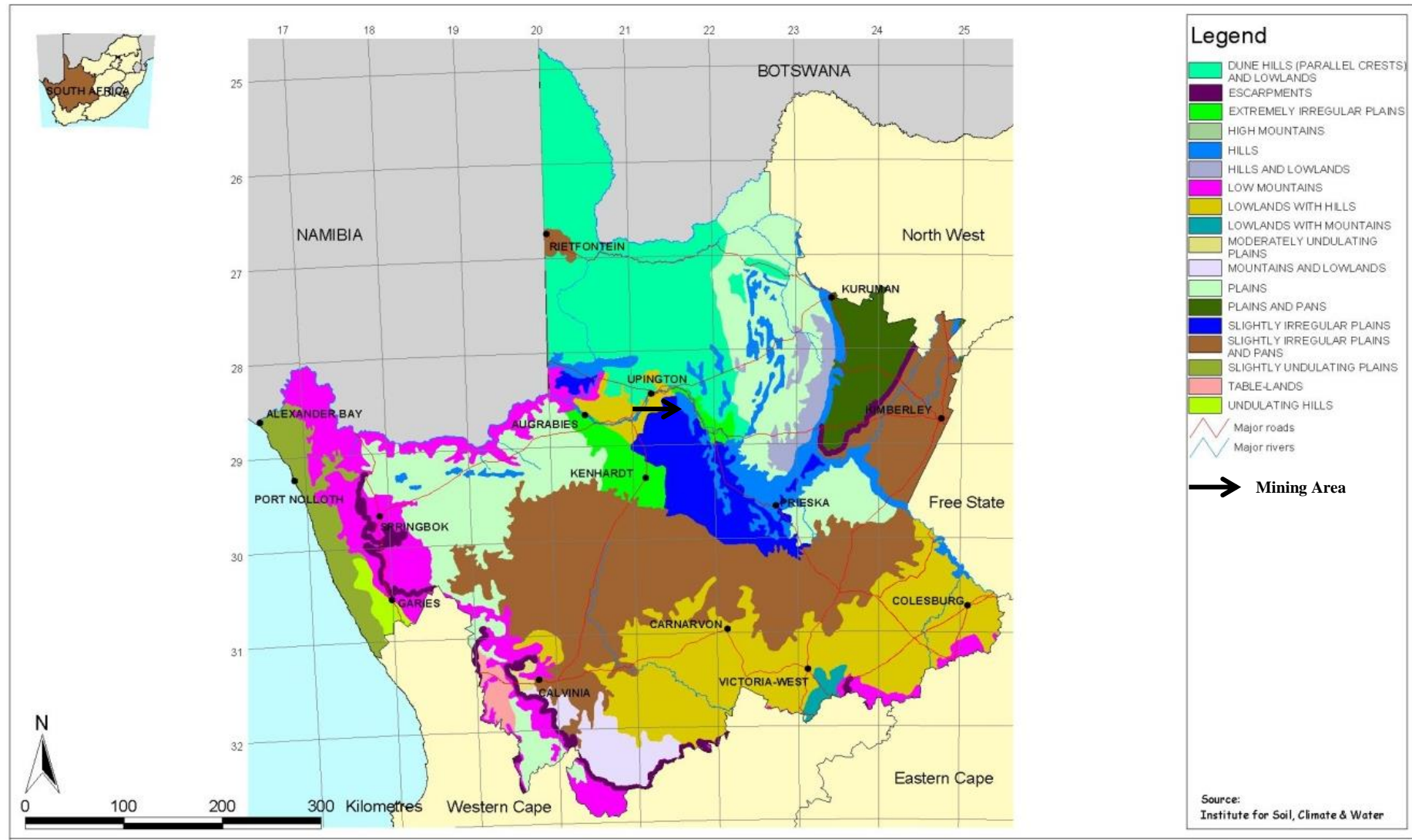
Only traffic-generated noise occurs in the area at present and such noise levels are low (observed estimate at ± 55 dBA).

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

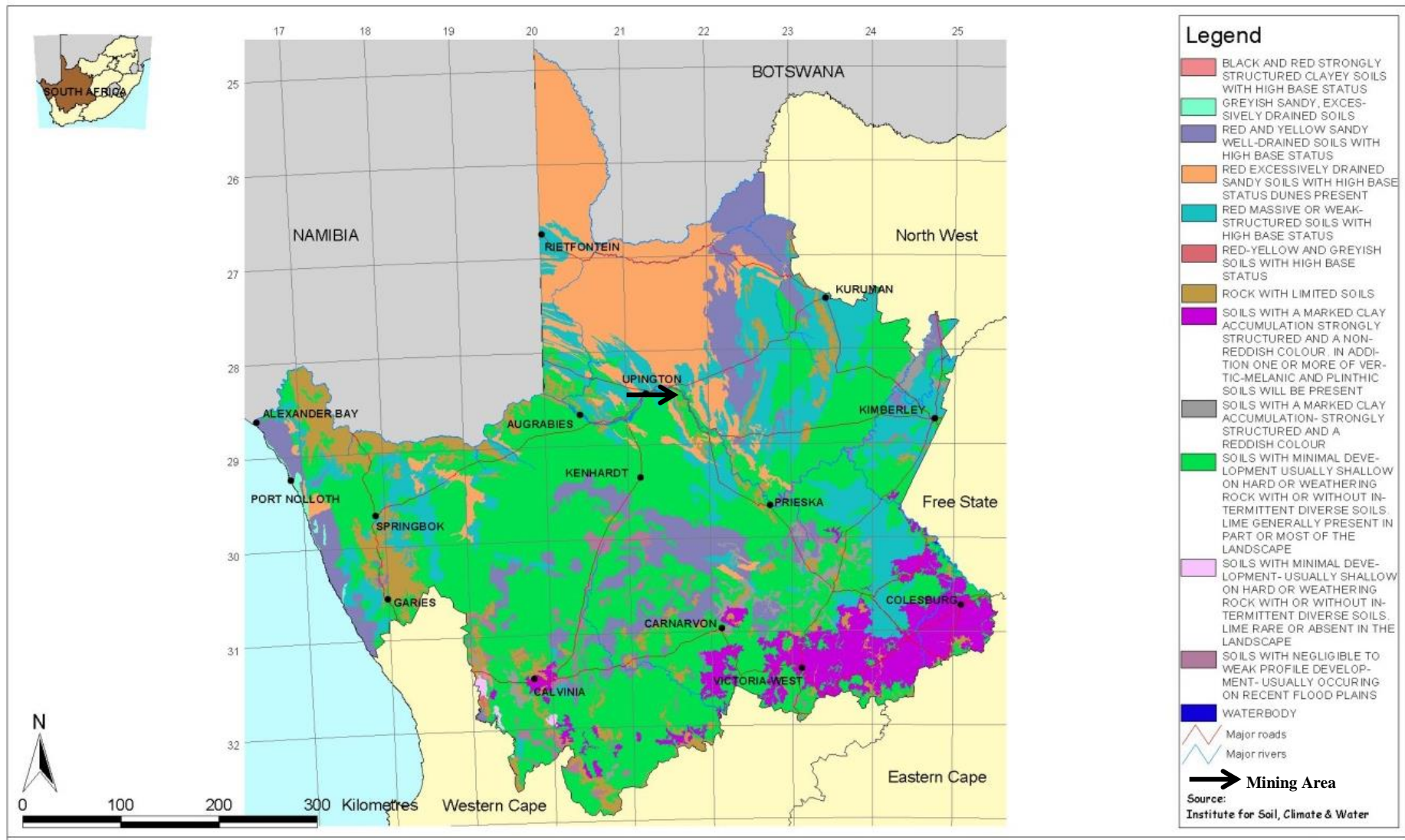
Map 1: Land use patterns of the Northern Cape



Map 2: Terrain Morphological units of the Northern Cape



Map 3: Generalised Soil Description of the Northern Cape



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

Description of potential impacts identified on the cultural heritage environment

Mining will continue within an existing mine and given the extent of the activities on site to date no phase 1 archaeological study has been conducted.

No fossils have yet been reported in any of the historic mining operations and there is very little chance of fossils being present on the site. Should any fossils be discovered or unearthed in the process of mining, the permit holder will contact a South African Museum or University which employs paleontologists so that the necessary paleontological salvage operations can take place. No other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or views are present on the mining area.

Description of potential impacts identified on the socio- economic conditions

The only other land use in the area is small stock grazing and due to the small extends of the mining operation there will be no impact on productivity. The area is also disturbed by historic mining activities.

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

The mining operation itself will not create many employment opportunities but the spinoffs due to the larger road maintenance and other building projects will contribute to employment and skills development.

Description of potential impacts identified on the biophysical environment

Mining will be in the form of an opencast mine. Stone aggregate would be mined from the burrow pit. The areas allocated for mining and stockpiling would first be stripped of all available topsoil. This topsoil would be stockpiled separately for later use when the quarry is rehabilitated. Any oversize material and rocks will be removed and stockpiled separately for later use when the quarry is rehabilitated.

Processing will take place by crushing and screening making use of a mobile crusher plant. The estimated footprint of the excavation is 3Ha and at final closure the sides of the excavation will be profiled to form an even depression.

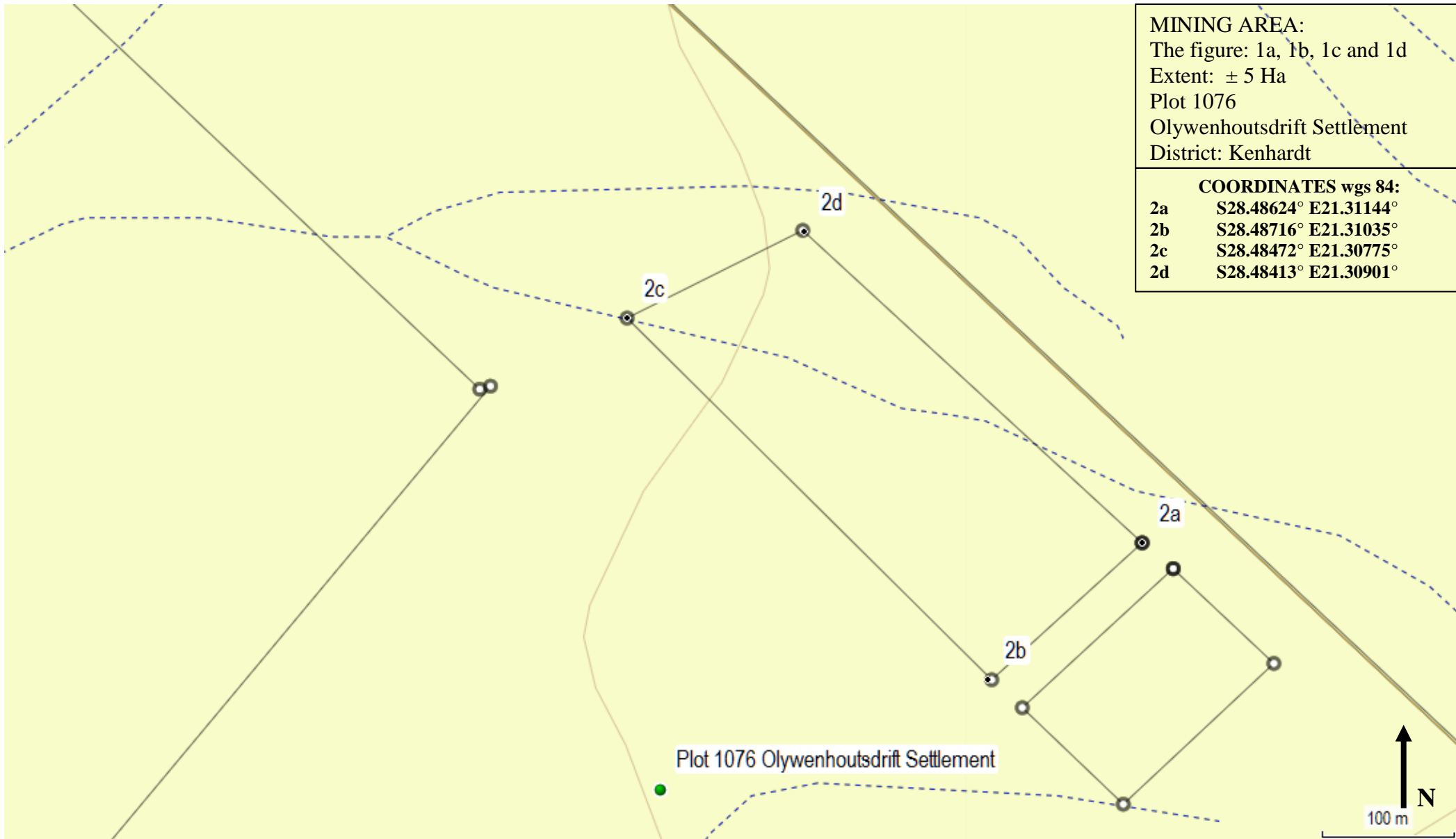
The implementation of the mitigating and management measures prescribed in the EMP section 3 will address all the impacts and after implementation of the mitigating measures most impacts can be classified as insignificant especially when looking at the current state of the environment.

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

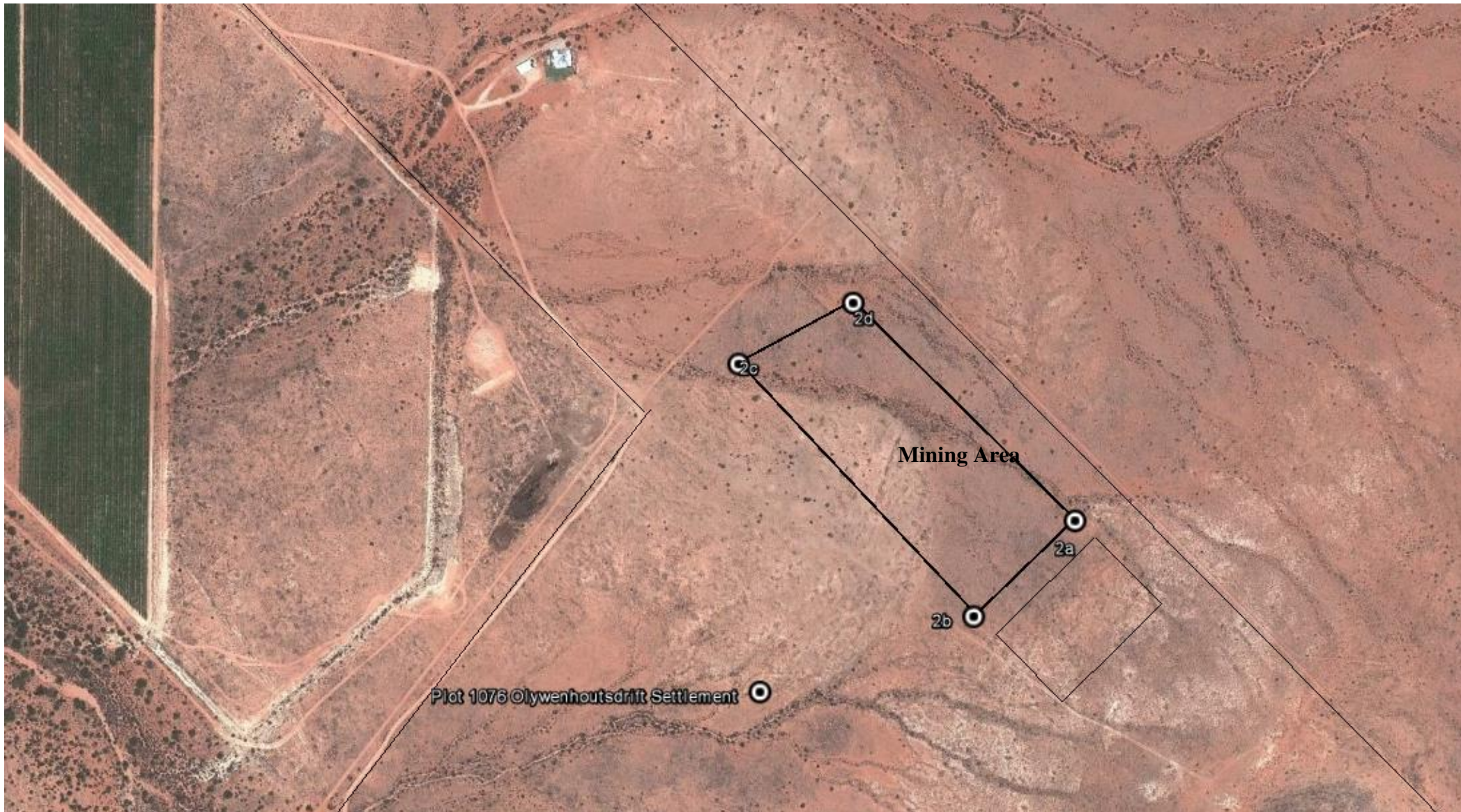
Locality plan



Layout plan



Landscape



- 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,

Lot 1076 a portion of Lot 455 Olyvenhoutsdrift Settlement is registered in the name of Kobus Duvenhage Bouers CC and the applicant is one of the members and Director of the company. No community is therefore identified with an interest in the property as the property is privately owned farm land with no lands claim registered on the property.

The consultation template was supplied to the following I&A parties and/or personal communication has taken place.

- Khara Hais Municipality representing the broader community
- All neighbours to the property
- All other interested parties were invited to comment on the proposed project by means of an advertisement in the local newspaper

All comments were supposed to be directed to the regional director DMR with copies to the applicant. Comment if any will be addressed as an amendment to this EMP.

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 mining operation.

2.1.1 Plan of the main activities with dimensions

Mining will be in the form of an opencast mine. Stone aggregate would be mined from the burrow pit. The areas allocated for mining and stockpiling would first be stripped of all available topsoil. This topsoil would be stockpiled separately for later use when the quarry is rehabilitated. Any oversize material and rocks will be removed and stockpiled separately for later use when the quarry is rehabilitated.

Processing will take place by crushing and screening making use of a mobile crusher plant. The estimated footprint of the excavation is 3Ha and at final closure the sides of the excavation will be profiled to form an even depression.

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

2.1.2 Description of construction, operational, and decommissioning phases

Construction phase

Due to the small scale of operations no infrastructure will be developed and only existing farm tracks will be used. Temporary storage facilities will only consist of one mobile container. The only other infrastructure will be the mobile crusher and screening plant and pit latrine.

Operational phase

Mining will be in the form of an opencast mine. Stone aggregate would be mined from the burrow pit. The areas allocated for mining and stockpiling would first be stripped of all available topsoil. This topsoil would be stockpiled separately for later use when the quarry is rehabilitated. Any oversize material and rocks will be removed and stockpiled separately for later use when the quarry is rehabilitated.

Processing will take place by crushing and screening making use of a mobile crusher plant. The estimated footprint of the excavation is 3Ha and at final closure the sides of the excavation will be profiled to form an even depression.

Decommissioning phase

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

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

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

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

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

2.2 Identification of potential impacts

2.2.1 Potential impacts and listed activities

No infrastructure including roads will be constructed. Processing will only require a mobile crusher and screening plant to be constructed next to the excavation.

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

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

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

Natural Vegetation – Mining can have a potential impact on the natural vegetation outside the mining area due to off road driving and development of stockpiles.

Animal Life - The animal life around the affected area can possibly be chased away by the presence of mining activities.

Ground water – Ground water pollution is a possibility due to oil spills during routine maintenance of equipment.

2.2.2 Potential cumulative impacts

This area is duplicated by large tracts of land on all sides which offer the same habitat to fauna and flora. There will be no further degradation to the original land surface and due to rehabilitation of historic disturbances the land surface can only improve. Consequently there are no foreseen major environmental issues and no expectation of longer term impacts.

The only identified land use is small stock grazing and due to the restoration in land use and small scale of the operation mining will not have any additional impact and the land will revert back to its former use grazing with an improvement in production.

2.2.3 Potential impact on heritage resources

Due to the extent of mining activities to date no further impact on any heritage resources are foreseen. No fossils have yet been reported in any of the mining operations. Should any fossils be discovered or unearthed in the process of prospecting, the holder of the mining permit will contact a South African Museum or University which employs palaeontologists so that the necessary paleontological salvage operations can take place. No other heritage resources such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewsapes are present on the mining area.

2.2.4 Potential impacts on communities, individuals or competing land uses

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

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

No proposals were received during the consultation process. Any proposals received during the life of the operation will be addressed as an amendment to this EMP if necessary.

2.2.6 Confirmation of specialist report appended.

No specialist reports are deemed necessary as no sensitive areas are included in the proposed area.

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

3.1 Assessment of the significance of the potential impacts

3.1.1 Criteria of assigning significance to potential impacts

All surface disturbances are rated high

Dust is rated low if only minimal dust is expected to accumulate over the prospecting area, medium if it is expected to require dust suppression such as watering, and high if there is a risk that it will migrate beyond the prospecting area.

Noise is rated low if no machinery is to be used, medium if machinery is to be used, and high if there is a potential for complaints from public and neighbours.

All drainage is rated high

All blasting is rated high

All dust and noise from loading, hauling and transport is rated high

Drainage from ablution facilities are rated high.

3.1.2 Potential significant impacts

This impact assessment only deals with significant impacts and as mining will continue from existing mining operations all the impacts already exist and no new impacts will be created by this mining operation. The implementation of the mitigating and management measures prescribed will address the existing impacts and after implementation of the mitigating measures most of the inherited impacts can be classified as insignificant especially when looking at the current state of the environment

Geology

Significance/Magnitude	Duration	Probability	Timing
Low	Permanent	Certain	Activity

Due to the removal of all material an excavation of maximum 2 meters deep will remain. The areas allocated for mining and stockpiling would first be stripped of all available topsoil. This topsoil would be stockpiled separately for later use when the quarry is rehabilitated. Any oversize material and rocks will be removed and stockpiled separately. Mixing of the geological sequence of sediment will be avoided and at final closure oversize material and rocks will first be backfilled into the excavation before covering with available topsoil.

Topography

Significance/Magnitude	Duration	Probability	Timing
High	Long term	Certain	Activity

The excavation of the quarry without the possibility of backfilling will have a significant negative impact on the visual aspect of the topography. Any new overburden and topsoil dumps that will remain above surface will also have a significant negative impact on the visual aspect of the topography.

Soils

Significance/Magnitude	Duration	Probability	Timing
High	Permanent	Certain	Activity

Historic mining areas were not prepared by removing of topsoil and quarrying has taken place without a soil handling program. Topsoil was removed with the subsoil for filling material.

Ground water

Significance/Magnitude	Duration	Probability	Timing
Medium	Point	Unlikely	Activity

Due to the shallow nature of operations the impact on the groundwater is considered insignificant. The absence of a hazardous waste handling program can however have a significant impact through oil and fuel spills and soil contamination.

Visual aspects

Significance/Magnitude	Duration	Probability	Timing
High	Long term	Certain	Activity

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

3.2 Proposed mitigation measures to minimise adverse impacts

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

Due to the small scale op operations less than 4 Ha total footprints for all disturbances the significant impacts will be minimal especially when looking at the following:

- disturbances will concentrate in a historic mining area denude of all vegetation
- excavations will be limited to 1.5m to 2m deep

The only environmental aspects that will require mitigating and or management actions will be topography, visual impact, soil pollution and topsoil handling and natural vegetation.

3.2.2. Concomitant list of appropriate technical or management options

Topography

The impact of excavations on topography will be through the pit development and the temporary overburden stockpile along the length of the excavation.

Impact mitigation will take place through:

- Limiting the depth of the excavation to a maximum of 2m deep.
- Mixing of the geological sequence of sediment will be avoided and at final closure oversize material and rocks will first be backfilled into the excavation before covering with available topsoil.

- The processing plant will be constructed within the existing excavation and all waste and overburden will backfilled into the existing excavation.
- All historic overburden dumps within the mining area will be backfilled into the excavation.

Visual Impact

Impact mitigation of this impact is not feasible but it must be noted that:

- The impact is insignificant given the small scale of the activities and the isolation of the site
- The impact is temporary and after mining the excavations will be sloped, all oversize material and overburden will be backfilled, top soiled and allowed to re-vegetate naturally resulting in an even depression with no residual impact.

Soil

The impact on soil will arise during the removal of all available topsoil prior to the excavation of the pit. Such topsoil will be removed along with the vegetation (seeds and bulbs) to berm to the side of the excavation and the topsoil will be used as cover material after the overburden has been replaced.

All removed topsoil will be placed in heaps not exceeding 1.5m. The purpose of such restriction is an attempt to retain a viable seed bank within the stockpiled topsoil

When the excavation is to be rehabilitated, the procedure entails replacement of the overburden, levelling of the replaced overburden surface, replacing of topsoil and allowing natural re-vegetation.

Natural Vegetation

No unnecessary access into the surrounding veld is to be permitted.

No vegetation will be removed to develop tracks as experience has shown that by not removing existing vegetation from area disturbed by traffic, the impact is that the vegetation is merely flattened and that such vegetation recovers quickly. Vehicles must use the same tracks and no haphazard turning in virgin veld is to be permitted.

Ancillary management and mitigating requirements

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

Mapping and setting out

A copy of the layout plan as provided for in Regulation 2.2 must be available at the mining site for scrutiny when required.

The plan must be updated on a regular basis with regard to the actual progress of the establishment of surface infrastructure, mining operations and rehabilitation (a copy of the updated plan shall be forwarded to the Regional Manager on a regular basis).

A final layout plan must be submitted at closure of the operation or when operations have ceased.

Demarcating of mining area

The mining area must be demarcated by means of beacons at the corners and no activities will be allowed outside the demarcated area.

Restrictions on mining

No owner or manager shall carry on any mining operations under or within a horizontal distance of a 100 meters from buildings, roads, or any structure whatever, or under or within a horizontal distance of 100 meters from any surface which it may be necessary to protect, without first having given notice in writing to the Principle Inspector of Mines of his intention to do so and obtain his permission therefore.

No mine waste will be allowed to be deposited in natural drainage lines or erosion gullies without the necessary authorization from DWAF and a written permission

from the DMR. Mining must be conducted in such a manner as to ensure that natural drainage lines are not destabilized and that surface and ground water quality is not impaired.

Responsibility

The environment affected by the mining operations shall be rehabilitated by the holder, as far as is practicable, to its natural state or to a predetermined and agreed to standard or land use which conforms with the concept of sustainable development. The affected environment shall be maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. It is the responsibility of the holder of the mining permit to ensure that the manager on the site and the employees are capable of complying with all the statutory requirements which must be met in order to mine, which includes the implementation of this EMP and the environmental awareness plan.

Roads & Tracks

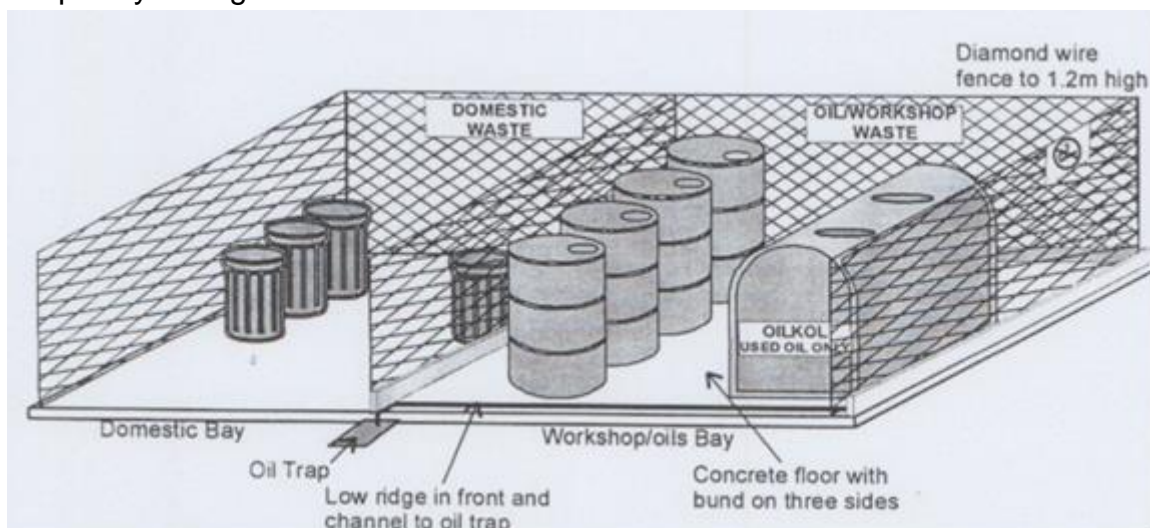
a) Formal roads: Farm tracks quickly deteriorate should they experience more than the minimum traffic. The result is that drivers leave the deteriorated track and drive in the veld next to the track, causing extensive damage to the veld. In order to prevent such damage, these "well-traveled" routes will have to be armoured with imported material.

Should a formal road be developed, then such road will / may require the importing of foreign material for surfacing (likely to be existing coarse material from the processing plant). Should such material be required and the landowner does not wish to retain the road, then the rehabilitation of such road must take place as follows:

1. Before developing the road, remove all topsoil to berms to the side of the road for re-use in rehabilitation of the road
2. During the rehabilitation of the road the following must occur:
 - a. Scarify hardened road area
 - b. Return and spread stockpiled topsoil
- b) Tracks are less formal than roads and will result where very little traffic will be required. Existing farm tracks will be used where possible. Any new tracks will not have topsoil removed but will be rehabilitated through a single pass of a 2 toothed scarifier (avoiding disturbance of the "middelmannetjie") only after consultation with the farmer.

Domestic Waste Management Facilities:

Refuse bins must be placed at strategic places throughout the mining area. Refuse will be removed daily from that bins for transport to the main facility located at the plant area. Such facility must be developed according to the following guidelines for temporary storage of domestic and industrial waste:



Oil/Fuel Leak Management:

Fuel receipt, storage and dispensing:

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

- The fuel delivery bowser driver will be cautioned to adhere to safe driving speeds and drive cautiously on the gravel roads.
- The parking area for the fuel tanker at the processing plant must be developed according to the following design guidelines:
 - ✓ Construction of a bund wall capable of holding the full capacity of the mobile tanker parked within it.
 - ✓ Construction of a concreted floor or PVC facility.
 - ✓ Construction of a concreted or PVC service apron sufficiently large to catch fuel spills during receipt and supply of fuel.
 - ✓ Such apron to be dished to lead rain-water or wash-water to drain pit (sump) for collection of oily-run-off and suitable decontamination disposal thereof.
- During dispensing of fuel to other facilities (plant, and other tanks) or field vehicles via tanker, the dispensing vehicle is to be fitted with suitable pumps and funnel extensions to reduce the risk of spillage in the transfer of fuels.

Emergency repairs on site:

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

In addition:

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

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

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

General Provisions

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

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

3.3 Review the significance of the identified impacts

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

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

4.1 Plans for quantum calculation purposes.

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

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

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

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

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

4.2 Accountability for plan implementation

4.3 Plans for quantum calculation purposes.

Refer diagrams above.

4.4 Alignment of rehabilitation with the closure objectives

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

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

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

The area will be profiled to blend in with the topography of the surrounding environment. The mitigating measures described in paragraph 3 are compatible with these closure objectives.

4.5 Quantum calculations.

The area will be rehabilitated with the original land use namely small stock farming in mind and the productivity of the area after closure will be the same as before mining operations started. Rehabilitation cost is estimated with the proposed end-state in mind and although the applicant has his own equipment and rehabilitation will take place concurrent with mining the tariffs for equipment was based on local hiring tariffs in Upington the closest major town 10Km to the west.

The provision for rehabilitation of the site will be supplied by means of a bank guarantee to be supplied to the Department of Minerals & Energy. The purpose of such a fund provision is to provide for rehabilitation of the site by State nominated contractors should the applicant for any reason be unable to complete the rehabilitation activities or complete them insufficiently.

Rehabilitation of access roads

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

Rehabilitation of the office/camp site

No permanent structure will be build.

Rehabilitation of vehicle maintenance yard and secured storage areas

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

Rehabilitation of surface disturbance

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

Backfilling, profiling and spread topsoil	3750 m ³ @ R 6.00 /m ³	R22 500.00
Ripped 3km tracks	9000 m ² @ R0.15 /m ²	R 1 350.00
Manual labor @ R500.00/day for clean-up		R 5 000.00
Cost of rehabilitation:		R28 850.00

Final rehabilitation

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

Extent:	5Ha
Duration of rehabilitation:	1 day
Equipment required:	
Manual labor @ R500.00/day for clean-up	R 650.00
Cost of rehabilitation:	R 650.00

The applicant is willing to escalate the total estimated amount of R 29 500.00 that is needed for rehabilitation to R30 000.00 that is more than is needed for the rehabilitation of damage caused by the operation, both at sudden closure during the normal operation of the project or at final, planned closure.

4.6 Undertaking to provide financial provision

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

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

5.1 List of identified impacts requiring monitoring programmes.

None of the impacts identified required specific monitoring programs but a second closure objective is to ensure that the rehabilitation and mitigating measures applied during operation prove successful. The only way to accomplish this is by regular monitoring.

5.2 Functional requirements for monitoring programmes

Monitoring

Monitoring on all the environmental issues will be carried out on a regular basis. This includes monitoring of waste washed in from outside, the re-vegetation process, erosion and the effect of windblown sand and/or dust. Any unforeseen impact or ineffective management measures that are identified during monitoring will be addressed as an addendum to the EMPR.

Aftercare

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

5.3 Roles and responsibilities for the execution of monitoring programmes

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

5.4 Committed time frames for monitoring and reporting

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

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

6.1 Rehabilitation plan

The goal of rehabilitation with respect to the area is to leave the area level and even, and in a natural state containing no foreign debris or other materials. All scrap and other foreign materials will be removed from the area and disposed of as in the case of other refuse, whether these accrue directly from the mining operation or are brought on to the site. Removal of these materials shall be done on a continuous basis and not only at the start of final rehabilitation and closure.

The overburden from the excavation will be back filled and covered with available topsoil. The area will be profiled to blend in with the topography of the surrounding environment. The mitigating measures described in paragraph 3 are compatible with these closure objectives.

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

The environment affected by the operation shall be rehabilitated, as far as is practicable, to its natural state. Land use will be the same as before mining with the same production with regard to grazing by livestock. The affected environment shall

be maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof.

6.3 Confirmation of consultation

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

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

7.1 Employee communication process

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

Environmental awareness will be fostered in the following manner:

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

7.2 Description of solutions to risks

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

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

7.3 Environmental awareness training.

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

The induction course will compose of the following steps:

- The first step will include background discussion of the environment concept: of what it comprises and how we interact with it.
- The second step will be a description of the components and phases of the specific mining operation.
- The third step will be a general account of how the mining operation and its associated activities can affect the environment, giving rise to what we call Environmental Impacts.

- The fourth and most important step will be a discussion of what staff can do in order to help prevent the negative environmental impacts from degrading our environment. This is known as Environmental Impact Management.

8 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	JACOBUS JOHANNES DUVENHAGE
Identity Number	640629 5067 089

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