



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: Gerhard Malan

REFERENCE NUMBER: NC30/5/1/3/2/10439 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

Mining will take place within a drainage channel that is in flood once a year and mining only takes place in the top 1.5m section containing river sand. The proposed mining area is an extension of current mining activities 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

Fossils that might be found within the sandy deposits on the site are of generally low paleontological significance. Although potentially more important fossils may be present deeper down, it is not anticipated that excavations will penetrate deep enough to affect the relevant deposits. Mining will take place within a drainage channel that is in flood once a year and mining only takes place in the top 1.5m section containing river sand. 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 mining 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

No infrastructure will be affected due to the remote locality of the operation. 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.

Mining will take place within a drainage channel with no topsoil only river sand that is washed onto the site during flood events.

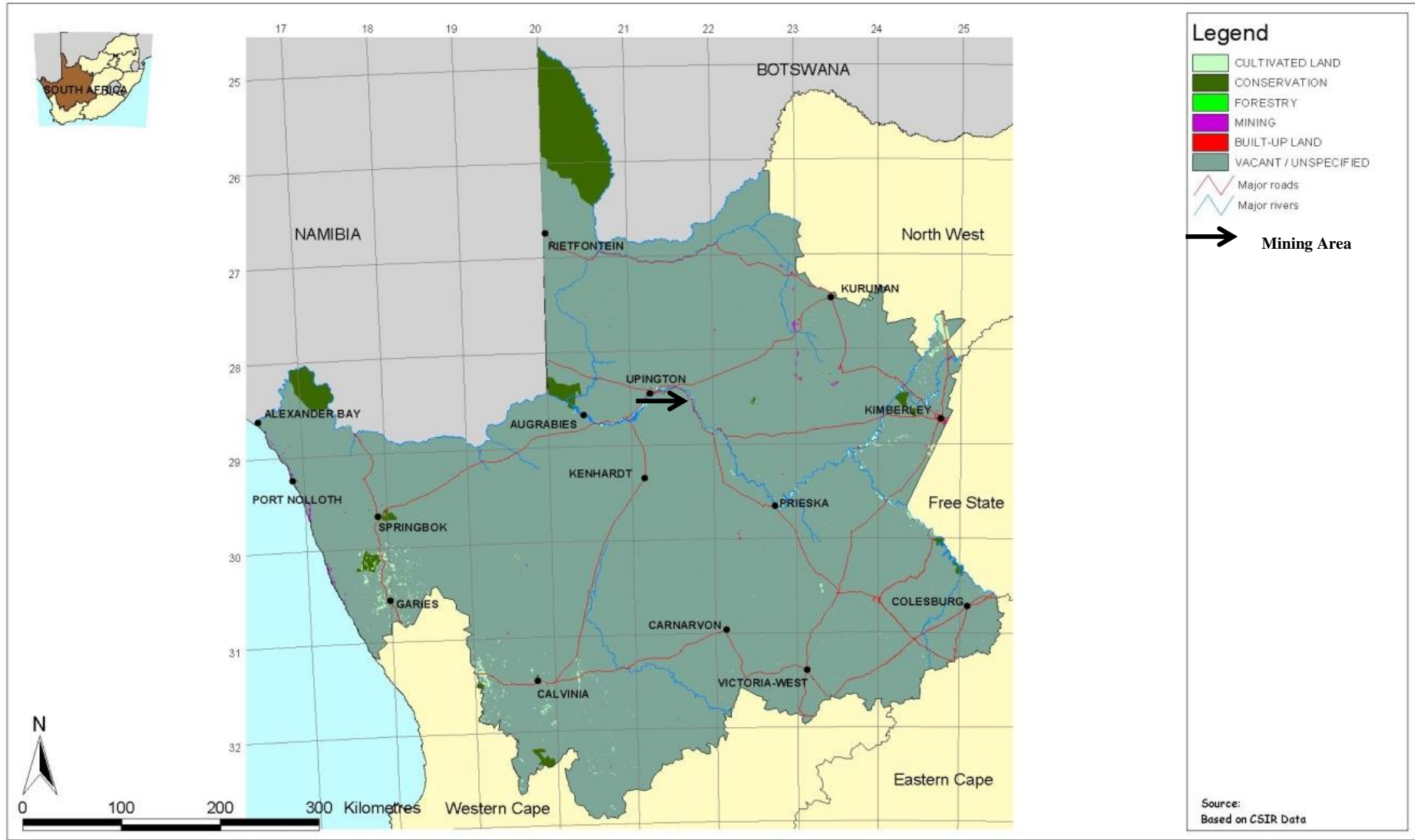
Natural vegetation / plant life

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.

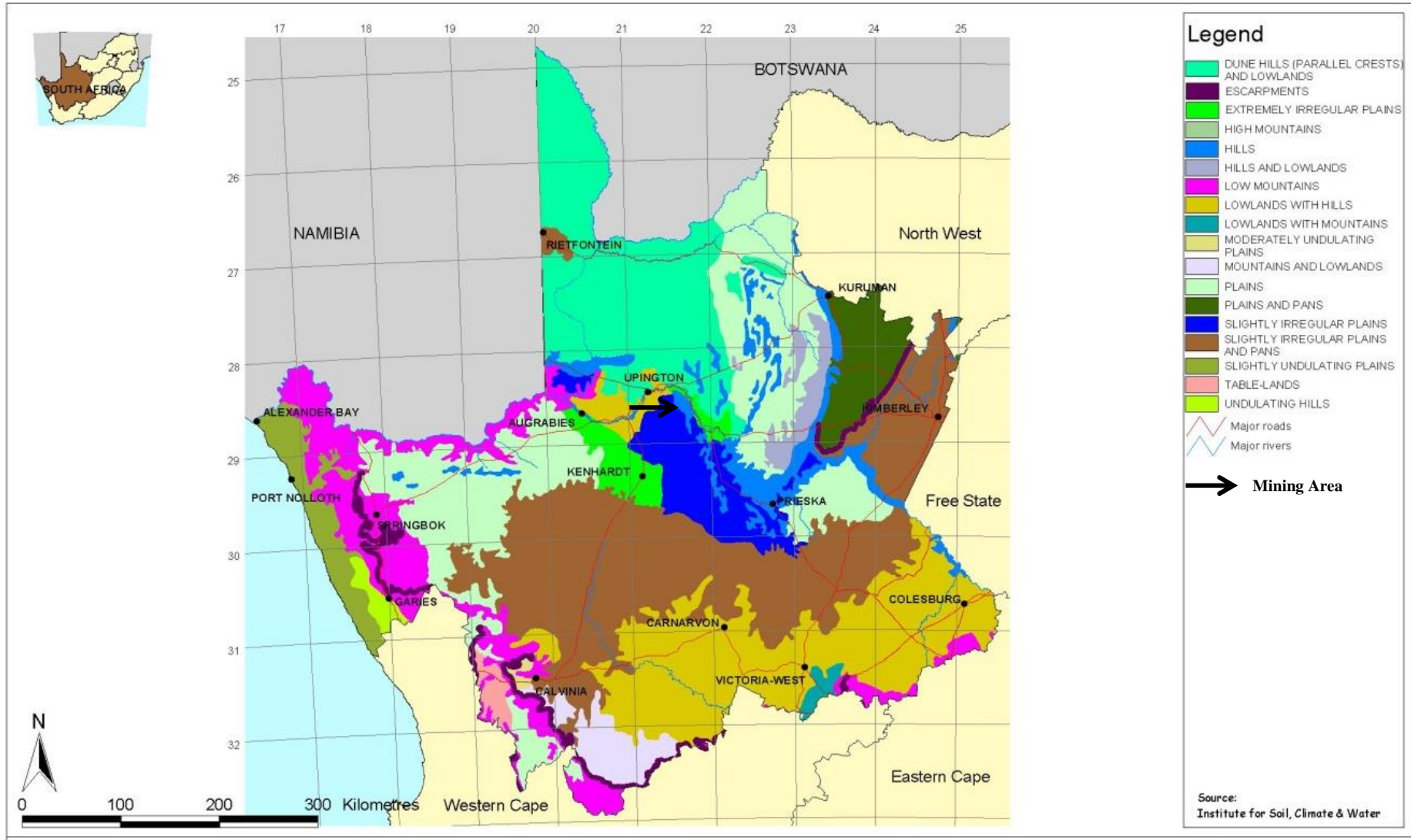
Animal Life

Large indigenous herbivores are absent due to the competitive land use and mammals are mainly represented by small mammals like hare and rodents. No rare species were reported and given the extent of similar land types in the area, any rare or endangered species will migrate to the surrounding habitat.

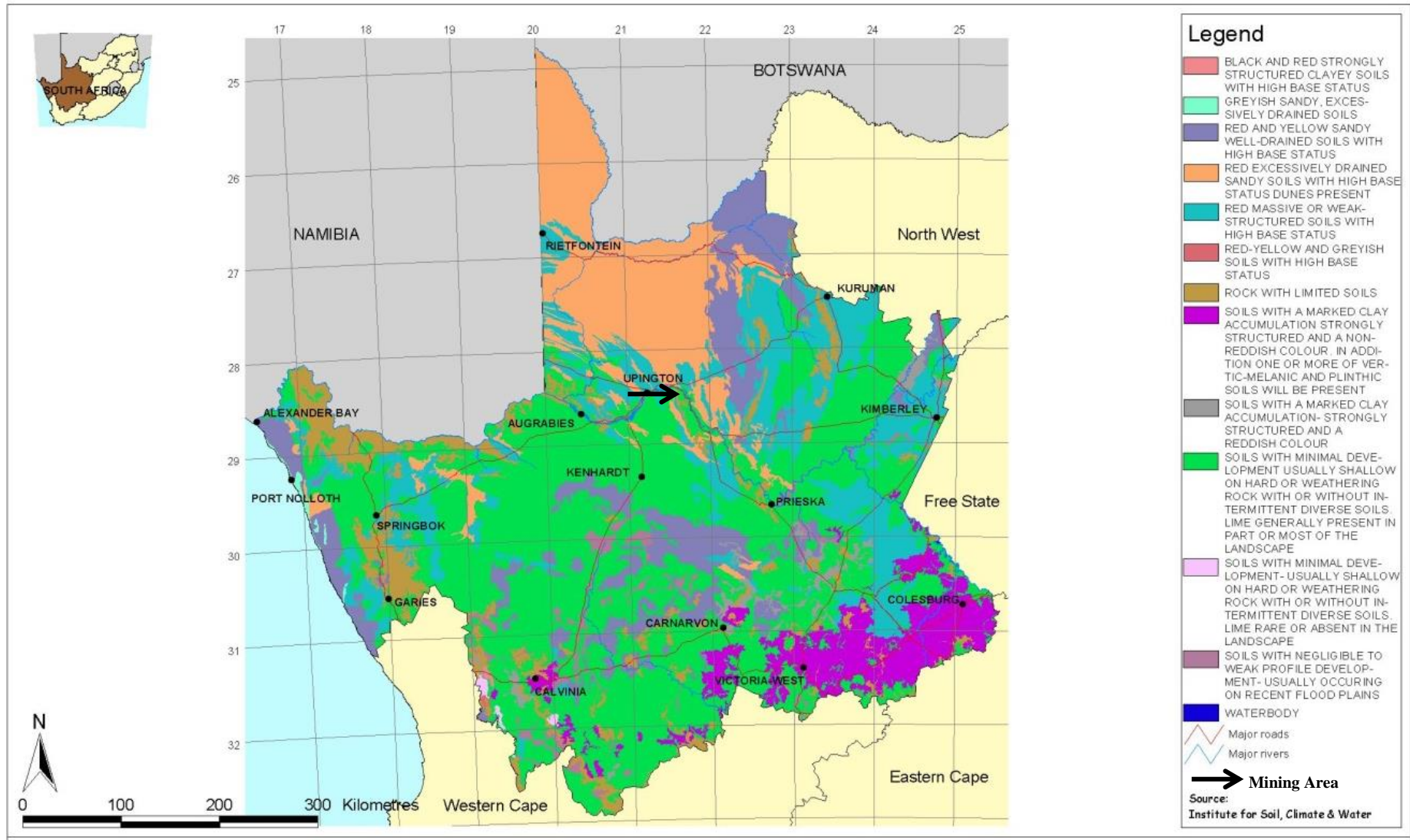
Map 1: Land use patterns of the Northern Cape



Map 2: Terrain Morphological units of the Northern Cape



Map 3: Generalised Soil Description of the Northern Cape



Surface Water

Mining will take place in a seasonal drainage channel. Surface water only accumulates in the drainage channels after exceptional good rains. Given the variability of semi-arid rainfall, the calculation of the mean annual runoff (MAR) would be of no use. The MAR is in any event very low given the low rainfall less than 250 mm per year occurring mainly in the 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.

The flow of the drainage channel will not be impeded in any way and damming upstream will not occur. The canalization of the flow will not result in scouring or erosion of the river-bank.

Access to the riverbed for the purpose of conducting excavations in the river-bed, will be through the use of only one access point at a time.

Groundwater

No groundwater will be used during the mining operation and due to the shallow nature of the operation there will be no impact on groundwater.

Air Quality

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

Noise

Background noise level is the same as for other small settlements and at present such noise levels are low, below 55dBA.

- 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

Fossils that might be found within the sandy deposits on the site are of generally low paleontological significance. Although potentially more important fossils may be present deeper down, it is not anticipated that excavations will penetrate deep enough to affect the relevant deposits. Mining will take place within a drainage channel that is in flood once a year and mining only takes place in the top 1.5m section containing river sand. 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.

Only one machine operator will be employed together with one part time admin clerk. The mine will be in operating from 8H00 to 18H00 that is less than from sunrise to sunset.

Because of the presence of the low sensitivity washed river sands on the site, the potential impacts to fossil heritage are likely to be low. Furthermore, deep excavations into potentially more significant deposits will not take place. No built

structures will be affected by the proposed development. No known graves will be affected by the proposed development.

Cultural landscape elements are lacking on the site. The sense of place will be affected, however, but, due to the relatively limited extent of the visual impacts in the area, this impact is not considered very significant. Impacts to the sense of place are likely to be generally low due to the already altered state of the local area due to large scale agricultural practices in the immediate vicinity of the mining area.

As mining will be taking place within a drainage channel that is in flood on average once a year and mining only takes place in the top 1.5m section containing river sand 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 of victims of conflict, and cultural landscapes or viewsapes are present on the mining area applied for.

Description of potential impacts identified on the socio- economic conditions

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).

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 infrastructure development 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 strip-mining. Sand would be mined from a seasonal stream to a maximum depth of 1.5 meter. No topsoil is present in the river bed due to regular flood events. Any oversize material and rocks will be removed and spread evenly over the river bed as part of final rehabilitation.

Processing will take place offsite by screening to remove any plant remains from the sand. 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 Map showing the spatial locality of all environmental, cultural/heritage and current land use features identified on site.

Diagram 1: Layout plan

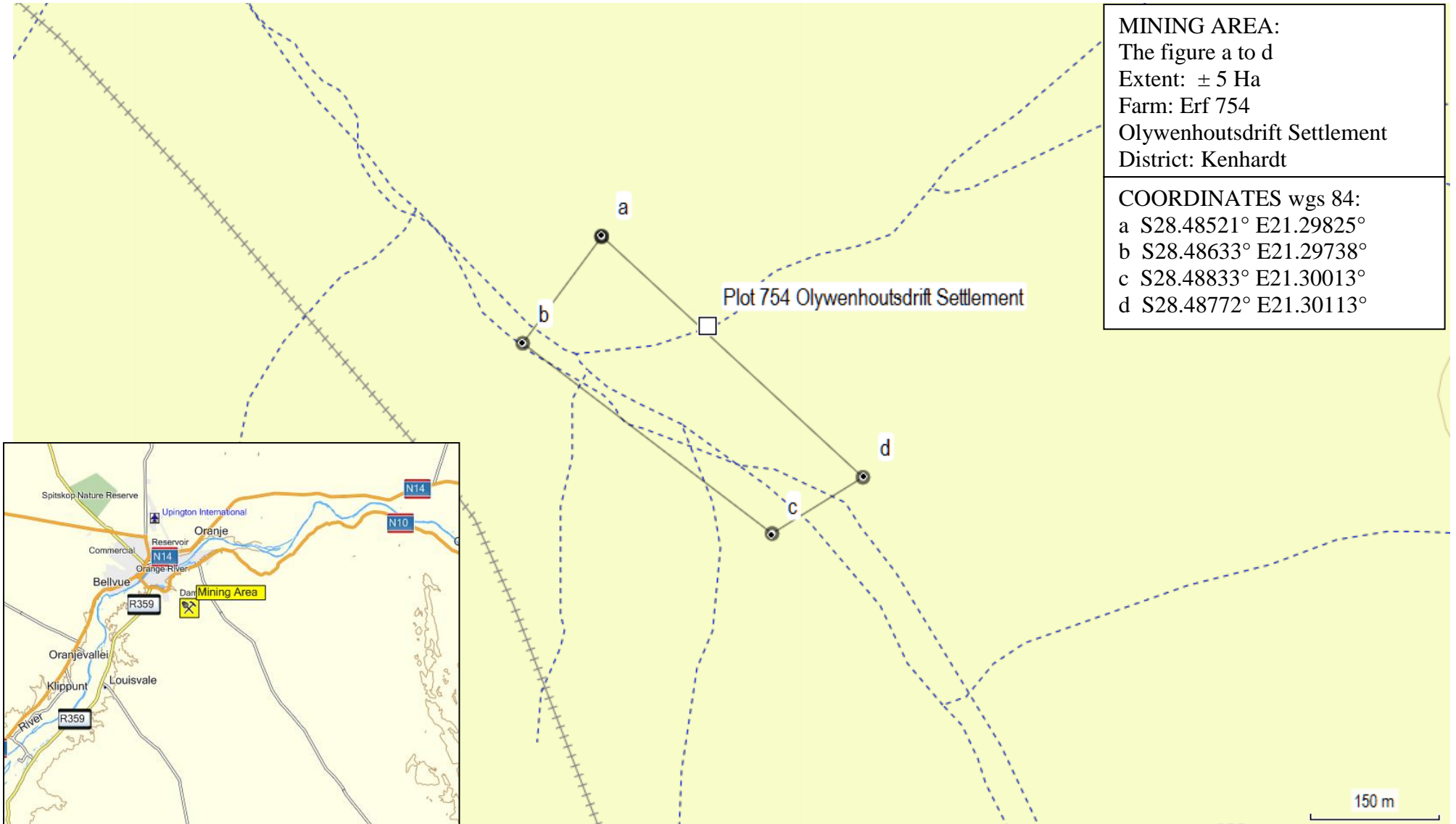


Diagram 2: Landscape



- 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,

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

- Pioneer Foods (Pty) Ltd as registered landowner by virtue of title deed T18905/2013.
- Khara Hais Municipality representing the broader community
- 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

The plans submitted under paragraph 4.1 show the main land uses on the proposed mining area and as can be seen the whole area is situated within a drainage channel.

2.1.2 Description of construction, operational, and decommissioning phases

Construction phase

No infrastructure or roads will be constructed due to the small scale of the operation. No processing will take place that need infrastructure to be constructed except for a mobile toilet and storage container.

Operational phase

An estimated total of 16 000 m³ river sand will be mined per year from a seasonal drainage channel for building purposes.

The depth of the mining operations will be less than 1.5m as only building sand will be removed as it is washed onto the site from upstream. Backfilling is not an option as the sand is completely removed as it is washed in from upstream.

A natural clay floor exists below the sand and mining only include the removal of sand washed in from upstream after flood events and do not continue into the clay layer. Due to the shallow nature of the operation there will be no impact on ground water or sub surface flow.

Mining can have an impact on the stability of the banks if not manage properly. The only environmentally friendly measure to stabilise these areas is by re-vegetation as artificial measures like gabions is not acceptable. Restoration ecology has shown that *Acacia karoo* as pioneer specie will establish relative easily on the banks after reinstating the original profile of the bank where scouring do occurred. A buffer 1.5 times the height of the banks but not less than 5 meter will be maintained and natural re-vegetation will be promoted by planting of endemic trees especially *Acacia karoo* in the buffer zone to create a micro habitat for under growth with a shallow root

system to stabilise the banks and prevent scouring in future flood events. Although more than one farm road leads up the river bank only one access point will be established and maintained at a time. Access points will be rehabilitated as mining continues downstream. In the event of damage from an occurrence where high flood waters scour and erode access points in the process of rehabilitation over the river-bank or an access point currently in use, repair of such damage shall take place immediately by reinstating the original profile of the river bank after such event has occurred and the river has subsided to a point where repairs can be undertaken. No mining will take place in the buffer zone and no riparian vegetation will be removed. No industrial or mine waste is generated during the mining process. All material consisting mainly of river sand is removed from the seasonal drainage channel to a depth of 1.5m and sold as a FoT product. No processing is taking place except for limited stockpiling so no mining waste or overburden and FRD will be created. No domestic or any other waste is generated during the mining operation. Only minor repairs are done on site. A PVC lining and drip trays are used during maintenance and accidental spills are cleaned up immediately by removing of the contaminated sand. The small volume of contaminated sand is sold with the rest of the sand to be used in the building industry. Only one front end loader is used in the mining process that is transported to the nearby workshops in town for major repairs. The front end loader will also be parked outside the drainage channel when not in operation. No diesel or oils will be stored on site and will be transported from Upington as needed.

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.

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

The only listed activity in terms of the Environmental Impact Assessment Regulations published in terms of Chapter 5 the National Environmental Management Act (Act No. 107 of 1998) is mining itself that will consist of removal of sand from a seasonal drainage channel. As interested and affected party the Department Environment will have to inform the applicant of any environmental authorisations needed as a result of listed activities.

2.2 Identification of potential impacts

ACTIVITY	POTENTIAL IMPACT	SIGNIFICANCE
Excavations	Surface disturbance	High
	Dust	Low
	Noise	Low
	Drainage	Medium
Stockpiles	Surface disturbance	High
	Dust	Low
	Drainage	Medium
Loading, hauling and transport	Noise	Low
	Dust	Low

2.2.1 Potential cumulative impacts

The only other land use in the area is small stock grazing and due to the small extends of the mining area there will be no impact. The cumulative impact due to other small scale sand mining in close proximity of the operation is still small enough to be regarded as insignificant.

2.2.2 Potential impact on heritage resources

Because of the presence of the low sensitivity washed river sands on the site, the potential impacts to fossil heritage are likely to be low. Furthermore, deep excavations into potentially more significant deposits will not take place. No built structures will be affected by the proposed development. No known graves will be affected by the proposed development.

Cultural landscape elements are lacking on the site. The sense of place will be affected, however, but, due to the relatively limited extent of the visual impacts in the area, this impact is not considered very significant. Impacts to the sense of place are likely to be generally low due to the already altered state of the local area due to large scale diamond mining and agricultural practices in the immediate vicinity of the mining area.

As mining will be taking place within a drainage channel that is in flood once every year and mining only takes place in the top 1.5m section containing river sand 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 viewsapes are present on the mining area.

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

The only other land use in the area is agricultural practices and small stock grazing and due to the small extends of the mining area there will be no impact on livestock production. The area is farmland that is not close to any settlement therefore no land development projects are in progress.

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

No proposals were received during the consultation process.

2.2.5 Confirmation of specialist report appended.

No specialist reports are deemed necessary as no sensitive areas are included in the proposed area and due to the small scale of operations.

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. The implementation of the mitigating and management measures prescribed in section C6.8 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

Geology

Significance/Magnitude	Duration	Probability	Timing
High	Permanent	Certain	Activity

Due to the removal of all material for building purposes an excavation of maximum 1.5 meters deep will remain. No backfilling will take place therefore mixing of the geological sequence of sediment will not occur.

Topography

Significance/Magnitude	Duration	Probability	Timing
High	Long term	Certain	Activity

The excavation of the sand pit without the possibility of backfilling will have a significant negative impact on the visual aspect of the perennial drainage channel.

Soils

Significance/Magnitude	Duration	Probability	Timing
Medium	Permanent	Certain	Activity

No topsoil is present within the drainage channel and all material will be removed to a depth of 1.5m. Only one front end loader will be used on site and only minor repairs will be done on site. A PVC lining and drip trays will be used during maintenance and accidental spills will be cleaned up immediately by removing of the contaminated sand. The small volume of contaminated sand will be sold with the rest of the sand to be used in the building industry.

Ground water

Significance/Magnitude	Duration	Probability	Timing
Medium	Point	Unlikely	Activity

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

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.

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 clearly demarcated by means of beacons at its corners, and along its boundaries if there is no visibility between the corner beacons.

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 DMD. 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.

Domestic Waste Management Programmes

The owner will instruct the employees in the need for procedure/tasks as well as the actual handling of domestic waste, relating to domestic waste management.

Domestic waste (lunch wrappers, containers, food tins, bottles) of daily workers as well as the domestic waste from the mining logistics will be provided for and handled as follows:

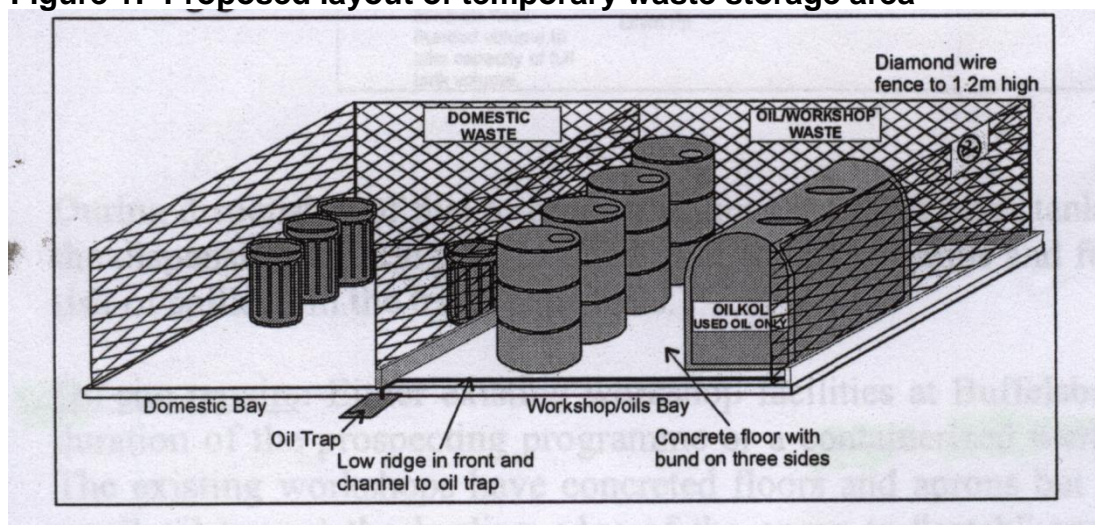
- Provide waste collection drums at strategic points (workshops/personnel amenity area, residential and recreational facilities).
- Demarcate an area for and constructed as "temporary waste storage area" for temporary collection and storage of the drums, prior to delivery to the municipal disposal site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

Industrial Waste Management

Identify and demarcate (by fences) the following sites:

- Temporary storage area for all used lubrication products and other hazardous chemicals

Figure 1: Proposed layout of temporary waste storage area



Diesel and Lubricant Handling Programme:

Refuelling of equipment from the trailer bowser will be conducted at a facility provided with a PVC lining to be constructed on site. The apron upon which the trailer is parked will be constructed outside the drainage channel with a drain along its extremities to collect any oil contaminated run-off and channel it to the oil trap where separated oil will be collected and disposed of in the oil recycling container.

All repairs which are to take place on site will take place making use of drip trays and a PVC lining. Waste oils from servicing of vehicles will be disposed of in the waste oil collection facility.

Contaminated spares, oil filters, gaskets, etc. will be collected in a separate drum at the designated storage facility for disposal at a suitable site off-site. Waste oils from servicing of vehicles will be disposed of in the waste oil collection facility.

Used oils will be stored in drums provided by the oil recycling companies such as Oilkol. A PVC lining and fence with signposts is to be constructed to store used oil and drums containing used spares, cloths, etc. which are oil contaminated and must be temporarily stored for collection/dispatch to suitable regional disposal site.

Excavations

When rehabilitating the access point the original profile of the riverbank will be re-established by back filling the access point with the original material excavated or other suitable material.

The rest of the bank will be profiled to promote re-vegetation and prevent erosion.

The goal of rehabilitation with respect to the area where mining has taken place in the drainage channel is to leave the area level and even, and in a natural state containing no foreign debris or other materials and to ensure the hydrological integrity of the river by not attenuating or diverting any of the natural flow. All scrap and other foreign materials will be removed from the bed of the river and disposed of as in the case of other refuse, whether these accrue directly from the mining operation or are washed on to the site from upstream.

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

An effective control program for the eradication of invader species and other exotic plants shall be instituted on a regular basis over the entire mining area under the control of the holder of the mining permit, both during mining and at the stage of final rehabilitation. All roads used will be repaired or rehabilitated if not needed by the landowner.

Stockpiles

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

Topsoil borrowing from the virgin areas to cover disturbed areas will not take place and movement of vehicles will be restricted to demarcated areas so as to keep the footprint of the mining operation to the absolute minimum.

The stockpile area needs to be fenced off to restrict operations to within the demarcated area.

At final closure all product needs to be removed from the stockpile areas and where product is mixed in with the subsoil the subsoil will also be removed. The stockpile areas and areas compacted due to hauling then needs to be ripped with erosion control measures before the topsoil previously stored area replaced.

All topsoil which is removed prior to any activity will be stockpiled in berms (no higher than 2m) along with its resident seed bank and vegetation cover to an area above the proposed development. This berm will then serve a storm water control function in the unlikely event of surface water run-off.

While existing dust generation has no noteworthy environmental impact on surround areas, dust should be controlled in the interest of improved worker health and safety. In this instance periodic wetting of the manoeuvring areas or even an annual application of a dust palliative can be considered. (No used oil or diesel is to be sprayed on the roadway for dust suppression).

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

4.1 Plans for quantum calculation purposes.

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

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

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

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

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

4.2 Accountability for plan implementation

Rehabilitation of infrastructure area

No infrastructure areas exist within this mining area except for the following:

- Standard ablution facilities in the form of mobile chemical toilets
- Temporary storage area for all used lubrication products and other hazardous chemicals in the form of mobile containers
- A bunded parking area for the mobile fuel tanker with apron

Progressive maintenance will take place so that in the case of temporary closure, sudden closure during the normal operation of the project or at final planned closure there will be no outstanding rehabilitation.

All waste in the temporary storage area for used lubrication products and other hazardous chemicals will be disposed of at a collection point in Port Nolloth from where it will be collected by a waste recycling company. This will be done at least every three months so that in the case of temporary closure, sudden closure during the normal operation of the project or at final planned closure there will only be three month worth of waste products to be dealt with. Financial provision is made in section 3 to deal with this small volume of hazardous waste if any.

When the mining area is fully developed services provided will include the following:

- Upgraded access road from the nearest public road to mining area
- Domestic waste disposal system

The access road is a dual use road and the mine is only responsible for the maintenance of the road. Provision must also be made for efficient storm water control to prevent erosion of steep slopes and roadways.

Domestic waste from the daily workers needs to be stored in drums provided for and disposed of at the municipal dumping site as part of the waste management program.

Progressive maintenance and upgrading of all services will take place and in the case of temporary closure, sudden closure during the normal operation of the project or at final planned closure there will be no outstanding rehabilitation.

Residue deposits and stabilization of the open cast pit

Discussed as part of rehabilitation of surface disturbance below.

Sealing of underground workings

Not applicable as there are no underground workings.

Stabilization of the open cast -workings

Discussed as part of rehabilitation of surface disturbance below.

Rehabilitation of surface disturbance

When rehabilitating the access point the original profile of the riverbank will be re-established by back filling the access point with the original material excavated or other suitable material.

The rest of the bank will be profiled to promote re-vegetation and prevent erosion.

The goal of rehabilitation with respect to the area where mining has taken place in the drainage channel is to leave the area level and even, and in a natural state containing no foreign debris or other materials and to ensure the hydrological integrity of the river by not attenuating or diverting any of the natural flow. All scrap and other foreign materials will be removed from the bed of the river and disposed of as in the case of other refuse, whether these accrue directly from the mining operation or are washed on to the site from upstream.

An effective control program for the eradication of invader species and other exotic plants shall be instituted on a regular basis over the entire mining area under the control of the holder of the mining permit, both during mining and at the stage of final rehabilitation.

Topsoil borrowing from the virgin areas to cover disturbed areas will not take place and movement of vehicles will be restricted to demarcated areas so as to keep the footprint of the mining operation to the absolute minimum.

The stockpile area needs to be fenced off to restrict operations to within the demarcated area.

At final closure all product needs to be removed from the stockpile areas and where product is mixed in with the subsoil the subsoil will also be removed. The stockpile areas and areas compacted due to hauling then needs to be ripped with erosion control measures before the topsoil previously stored area replaced.

All topsoil which is removed prior to any activity will be stockpiled in berms (no higher than 2m) along with its resident seed bank and vegetation cover to an area above the proposed development. This berm will then serve a storm water control function in the unlikely event of surface water run-off.

Financial provision is made in section 3 to deal with these mitigating measures in case of temporary closure or sudden closure during the normal operation of the project or at final planned closure.

Final rehabilitation

Successful implementation of the Environmental Management Program during the life of the mine will cover most of the significant aspects affecting the environment. Those aspects that will require some attention during the final decommissioning phase are listed below:

- Scarifying of all compacted areas due to hauling.
- All internal roads need to be ripped except for the ones still needed by the landowner; this also includes repairs to all fences and gates.
- All equipment and other items used during the mining operation needs to be removed from the site.
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be buried or burned on the site.

Financial provision is made in section 3 to deal with these mitigating measures in case of temporary closure or sudden closure during the normal operation of the project or at final planned closure.

4.3 Estimated cost for requirements to fully decommission the site

The area will be rehabilitated with the original land use namely small stock farming in mind. The productivity of the area after closure will be the same as before the start of the mining operation. Rehabilitation cost was estimated with the proposed end-state in mind.

Rehabilitation of access roads

No access roads will be constructed by the holder of the permit. Existing access roads will be used and maintained by the applicant. The road will not be decommissioned as it will still be needed by the landowner

Rehabilitation of the office/camp site, vehicle maintenance yard and secured storages areas

No camp sites will be constructed as services will be obtained within Upington.

Rehabilitation of excavation area

After mining the whole excavation area can be regarded as part of the dry river-bed. 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 and to ensure the hydrological integrity of the river by not attenuating or diverting any of the natural flow. All scrap and other foreign materials will be removed from the bed of the river and disposed of as in the case of other refuse whether these accrue directly from the mining operation or are washed on to the site from upstream.

No reeds or other riverine vegetation occur in the proximity of the dry river bed except for *Accasia karoo* trees that can be seen as riparian vegetation.

Rocks and coarse material removed from the excavation will be spread evenly over the bed of the river.

Extent:	5 Ha
Duration of rehabilitation:	16 hours
Equipment required:	
Front end loader for removal of stockpile and overburden dump 24 h X R500.00/h	R12 000.00
Ripping and profiling 12 h X R500.00/h	R 6 000.00
Cost of rehabilitation:	R18 000.00

Rehabilitation of processing areas

No processing areas will be present only limited stockpiling areas. The existing stockpile area will be used and no new virgin area will be disturbed by stockpiling. The stockpiling area will form part of final rehabilitation.

Final rehabilitation

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

Extent:	5 Ha
Duration of rehabilitation:	4 hours
Equipment require:	
Transport of material	R 2 000.00
Cost of rehabilitation:	R 2 000.00

Total cost of rehabilitation:

Rehabilitation of excavation area	R18 000.00
Final rehabilitation	R 2 000.00
Total	R20 000.00

4.4 Undertaking to provide financial provision

Financial provision required under Regulation 54 for the amount of R20 000.00 that is necessary for the rehabilitation of damage caused by the operation, both at sudden closure or at final, planned closure will be furnish to DME in the form of a bank guarantee.

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

5.1 List of identified impacts requiring monitoring programmes.

None of the impacts identified required specific monitoring programs but a second closure objective is to ensure that the rehabilitation and mitigating measures applied during operation prove successful. The only way to accomplish this is by regular monitoring. Monitoring on all the environmental issues as discussed in the EMPR will be carried out on a regular basis. This includes monitoring of waste washed in from outside, the re-vegetation process, erosion and the effect of windblown sand and/or dust. Any unforeseen impact or ineffective management measures that are identified during monitoring will be addressed as an addendum to the EMPR.

5.2 Functional requirements for monitoring programmes

Monitoring

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

Aftercare

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

5.3 Roles and responsibilities for the execution of monitoring programmes

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

5.4 Committed time frames for monitoring and reporting

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

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

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

Internationally, there seem to be three schools of thought:

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

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

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

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

The aim is to ensure that the affected environment is maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. The aesthetic value of the area will also be reinstated.

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

6.2 Confirmation of consultation

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

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

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

The property is a privately owned farm with no lands claim registered on the property.

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

The property is a privately owned farm with no community involvement.

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

No as the land is a privately owned farm with no lands claim registered on the property.

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

No land claim is registered against the property.

7.5 1.5. Name the Traditional Authority identified

No Traditional Authority only local municipality

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

The proposed mining area is situated on a portion of Erf 754 Olywenhoutsdrift Settlement in the Kenhardt district of the Northern Cape. The property is registered in the name of Pioneer Foods (Pty) Ltd by virtue of title deed T18905/2013.

7.7 List the lawful occupiers of the land concerned.

The only lawful occupier identified is the landowner.

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

No settlements or infrastructure are present on the proposed mining area and the only economic activity is agricultural practices.

7.9 Name the Local Municipality identified by the applicant

Khara Hais Municipality

7.10 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.

Department Environment and Nature Conservation responsible for scrutinizing all EMP's for new developments.

Department of Water Affairs and Sanitation as mining will take place within a seasonal drainage channel and the water use needs to be registered.

7.11 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.

The landowner was consulted by means of personal communication.

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

The Khara Hais Municipality as local authority was consulted by means of a registered letter informing them of the proposed operation.

All comments were supposed to be directed to the regional director DMR with copies to the applicant. All concerns will be addressed in the final EMP.

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

8.1 Employee communication process

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

Environmental awareness will be fostered in the following manner:

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

8.2 Description of solutions to risks

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

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

8.3 Environmental awareness training.

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

The induction course will compose of the following steps:

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

9 SECTION 39 (4) (a) (iii) of the Act: Capacity to rehabilitate and manage negative impacts on the environment.

9.1 The annual amount required to manage and rehabilitate the environment. Refer to section 4 that covers regulation 52 (2) (d) that handles with financial provision.

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

This amount was provided for in the cost estimate for the implementation of the project and proof of access to the necessary funds were supplied with the original application.

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	Gerhard Malan
Identity Number	5601255047086

-END-