



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: Zwartbooisberg Boerdery Trust

REFERENCE NUMBER: NC30/5/1/3/2/10183 MP

ENVIRONMENTAL MANAGEMENT PLAN FOR SMALL-SCALE MINING

**APPLICABLE TO MINING PERMITS WHERE LESS
THAN 2000 m³ PER QUARTER WILL BE
EXCAVATED USING MANUAL LABOUR
TECHNIQUES AND
NOT TO BE USED FOR GOLD OR COAL MINING**

**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 mining permits which do not include coal or gold mining, and where the total excavations will not exceed 2 000 m³ with a maximum of 16 000 m³ over the life of the mine including any permit renewal periods, 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) insofar it relates to small scale miners using manual labour techniques only, provided that it will only be valid in the hands of the person to whom the permit is issued and not in cases of a change in the scale of the operation or in cases of sub contracting, sub letting or the disposal of the permit to a third party. **It is not intended for general use in the case of mining permits.** The standard environmental management plan which was in use prior to the year 2011, will no longer be accepted.

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

ITEM	APPLICANT CONTACT DETAILS	ALTERNATIVE CONTACT DETAILS
Name	Zwartbooisberg Boerdery Trust	Johannes Rudolph Spangenberg
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Fax no:	054 4316100	
Cellular no	082 8202306	
E-mail address	santas@isat.co.za	
Postal address	P.O. Box 117 Kakamas 8870	Farm Boesmansrivier Kakamas 8870

ITEM	LANDOWNER CONTACT DETAILS
Name	Zwartbooisberg Boerdery Trust
Tel no	054 4316100
Fax no:	054 4316100
Cellular no	082 8202306
E-mail address	santas@isat.co.za
Postal address	P.O. Box 117 Kakamas 8870

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

1.1 Identification of interested and affected parties

IDENTIFICATION CRITERIA	Mark with an X where applicable	
	YES	NO
Has the landowner been identified?	X	
Is there a lawful occupier on the property other than the Landowner?		X
Is there a tribal authority or host community that may be affected?		X
Can it be confirmed that there are no land claims in respect of the area?	X	
Have the landowners or lawful occupiers of neighbouring properties been identified?	X	
Has the local municipality been identified?	X	
Are there power lines within 100 metres of the area applied for?		X
Are there public roads or railway lines within 100 metres of the area applied for?		X
Is there any other infrastructure within 100 metres of the area applied for? (Specify)		X
Has the Provincial Department responsible for the environment been identified?	X	
Have all of the parties identified above been provided with a description of the proposed mining operation as referred to in paragraph 2 below?	X	
Have all the parties identified above been requested in writing to provide information as to how their interests (whether it be socio-economic, cultural, heritage or environmental) will be affected by the proposed mining project?	X	

1.2 List of parties identified in 1.1 above that were in fact consulted.

LIST THE NAMES OF INTERESTED AND AFFECTED PARTIES CONSULTED	LIST THE INTEREST OF THE INTERESTED AND AFFECTED PARTIES CONSULTED e.g. Landowner, Neighbours, Community representative, Land claims commissioner, Local municipality, Government departments responsible for the environment, Departments or agencies responsible for infrastructure in the area.
Zwartbooisberg Boerdery Trust	Landowner
Advertisement in press	General public
DESCRIBE BELOW HOW THE CONSULTATION WAS CONDUCTED Mark with an X where applicable	
Written communication (Written responses must be attached as an annexure)	X
Meetings (Minutes of meetings must be attached as an annexure)	
Other (specify)	Advertisement in press X

1.3 Impact of the proposed mine on interested and affected parties.

LIST THE NAMES OF INTERESTED AND AFFECTED PARTIES CONSULTED	DESCRIBE THE POTENTIAL IMPACT ON THE INTERESTED AND AFFECTED PARTY CONSULTED AS IDENTIFIED BY THAT PARTY.
Zwartbooisberg Boerdery Trust	No additional impacts identified except for the ones in the consultation template Appendix B
Advertisement in press	No response on the advertisement placed refer Appendix B3

1.4 Information regarding objections

	Mark with an X where applicable	
	YES	NO
Have any of the interested or affected parties objected to the application?		X

DESCRIBE BELOW WHAT THE NATURE OF THE OBJECTION IS
No objections against the proposed mining operation that need to be dealt with by the REMDEC committee were received.

2 Description of the proposed mining operation

(Provide a description of the mining project and a plan of the permit area showing the main mining activities such as excavations, stockpiles, discard dumps and dams, water supply dams and boreholes, accommodation, and buildings, and processing plant. Note! Activities not shown here may not be conducted)

An estimated total of 16 000 m³ river sand will be mined from a sandbank left within the floodplain after a flood event for building and drainage purposes.

The depth of the mining operations will be less than 1.5m as only the sand bank will be removed. The total area under excavation will approximately be 1 Ha and sand will be removed over the total area. Backfilling is not an option as the sand is completely removed.

No industrial or mine waste is generated during the mining process. All material consisting mainly of river sand is removed from the sandbank to a depth of 1.5m and sold as a FoT product. No processing is taking place and no stockpiling as mining will only include loading and hauling 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 emergency repairs will be done on site. A PVC lining and drip trays are used during these repairs 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 farm workshop for major repairs.

Diagram 1: Locality plan contemplated in regulation 2(2) read with regulation 2(3) of the MPRDA Act, 2002 (Act No. 30 of 2002)

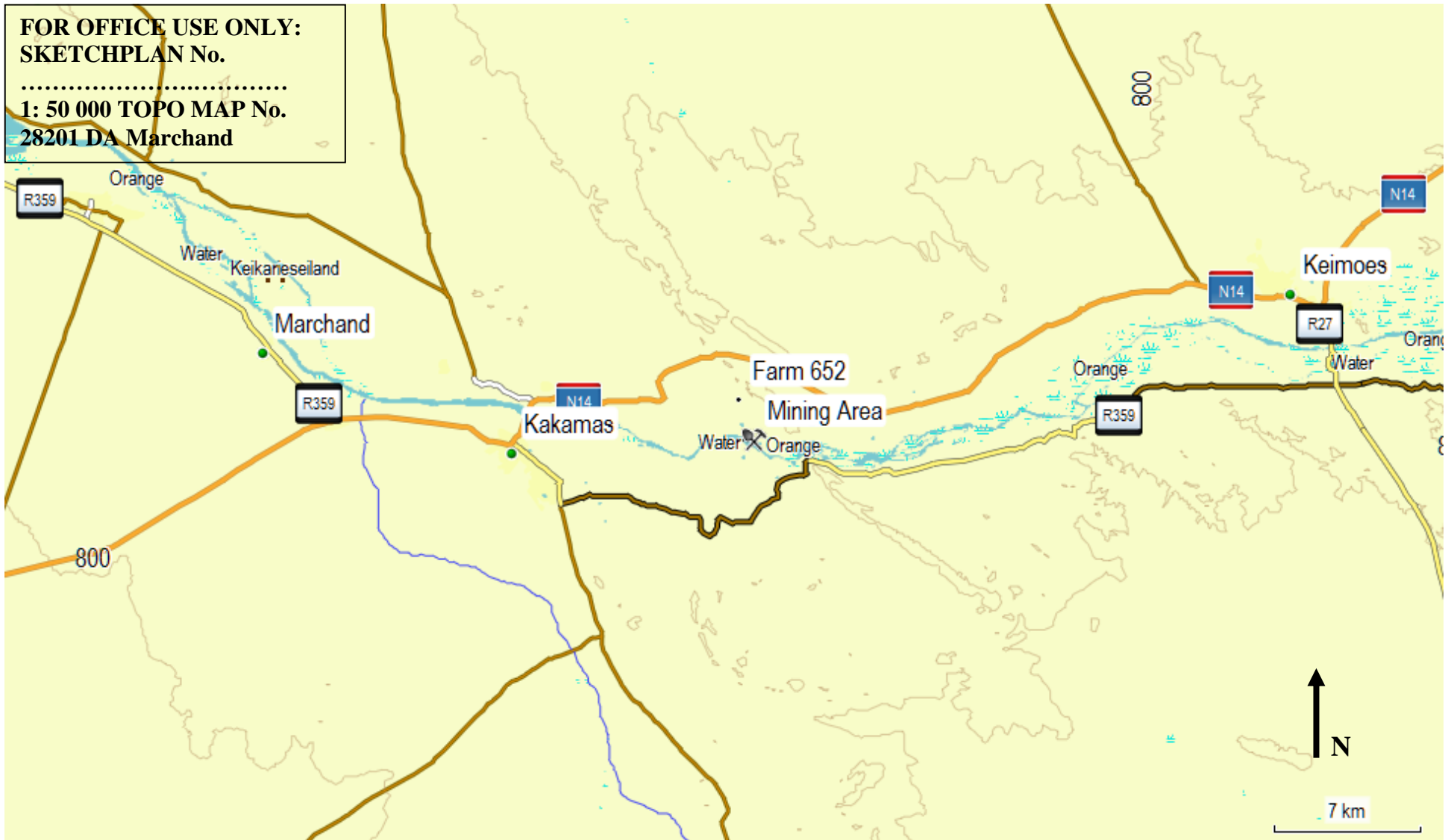


Diagram 2: Layout plan contemplated in regulation 2(2) read with regulation 2(3) of the MPRDA Act, 2002 (Act No. 30 of 2002)

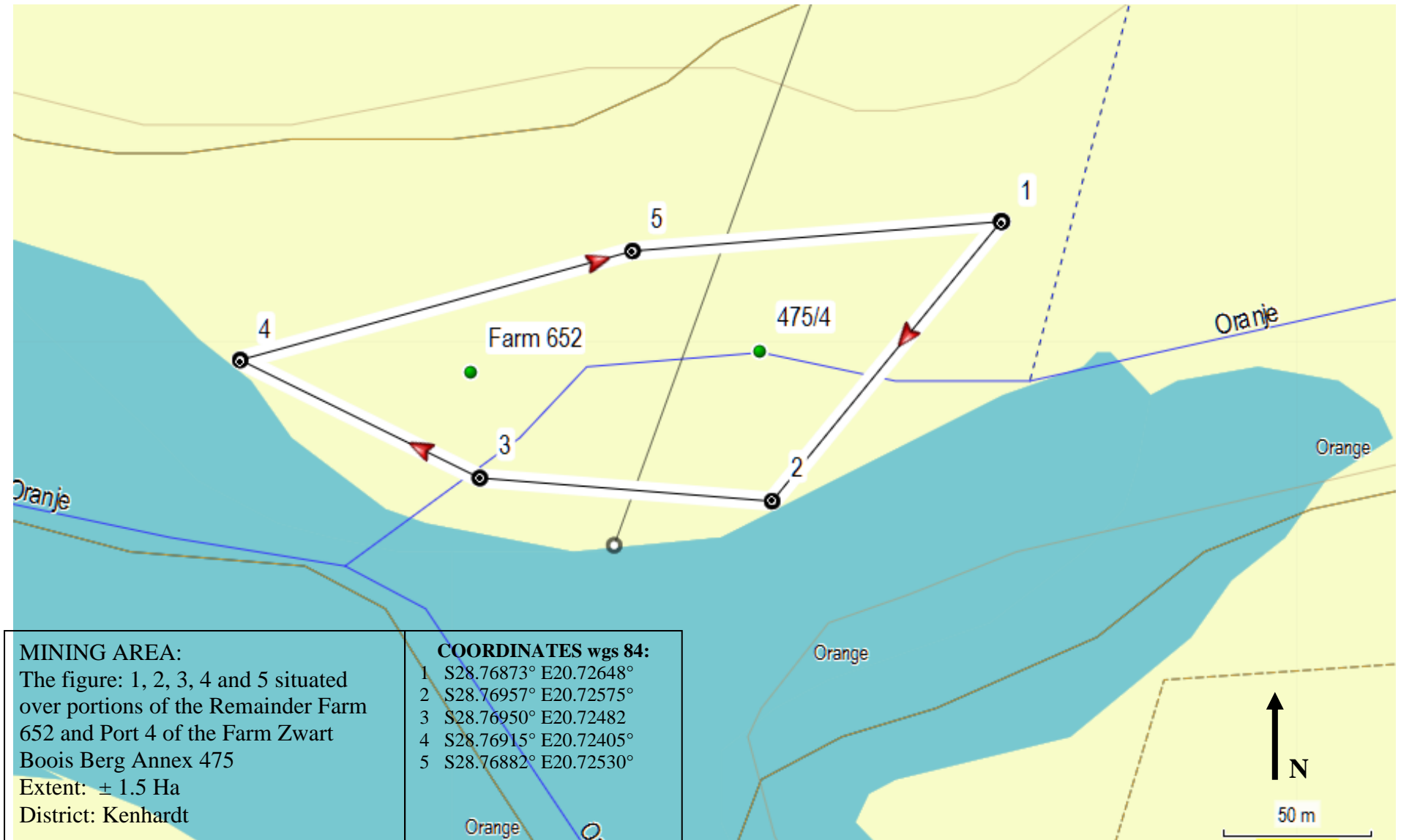


Diagram 3: Landscape showing the main mining activities such as excavations, stockpiles, discards dumps and dams, water supply dams and boreholes, accommodation, and buildings, and processing plant



3 Description of the environment likely to be affected by the proposed mining operation

(Describe the specific environmental features on the site applied for which may require protection, remediation, management or avoidance and attach a map showing the locality of all environmental, cultural/heritage and current land use features identified relative to the boundaries of the permit area applied for).

Heritage environment

With regard to sites of archaeological interest there will be no impact as mining is taking place within a flood plain and will only include the removal of a sandbank that were left behind after a flood event. The possibility to unearth any fossils or artifacts 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 viewscapes are present on the mining area applied for.

Land use and the socio-economic environment

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.

Infrastructure

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.

Biophysical environment

Topography

Low lying Bushmanland plains with very flat topography.

Soil

The soils in a regional context are reddish, moderately shallow, sandy, and often overlay layers of calcrete of varying depths and thickness. The soils are typically weakly structured with low organic content. These soils drain freely which results in a soil surface susceptible to erosion, especially wind erosion when the vegetation cover is sparse and gully erosion in areas where storm-water is allowed to concentrate. 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. No topsoil is available within the drainage channel only river sand that is mined to a depth of about 1.5 meter.

Natural vegetation / plant life

The natural vegetation surrounding the proposed mining area is dominated by Bushmanland grassland. This vegetation type is characterized by *Rhigozum tricototum*, *Sipagrostis obtusa* and *S. ciliata*. On the rocky areas *Lyceum* spp., *Laperosia* spp., *Senesio* spp., *Salsola* spp and *Aloe claviflora* are dominant. Other species include *Zygophyllum retrofractum* and *Asparagus* spp.

Within the floodplain the only vegetation is *Phragmites australis* an exotic species clogging up the river channels and river banks.

Animal Life

Larger herbivore species are absent due to the conflicting land use. The habitat is well represented in the surrounding area.

Surface Water

All mining will take place in a floodplain but not within 50 meters of the bank of the river. Mining will only include the removal of a sandbank left behind after a flood event and will not result in scouring or erosion of the river-bank. .

Access to the floodplain will be through the use of only one existing access track. The location of the access to the floodplain across the river-bank is at a point of the river-bank where the least damage to riparian vegetation will occur and will not be wider than is reasonably required.

Backfilling is not an option as all material in the form of river sand will be removed. Natural rocks present between the sand will be spread evenly over outside the mining area to improve the aesthetic value of the area.

The goal of rehabilitation with respect to the area where mining has taken place in the floodplain 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 area 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.

Surface water only covers this portion of the floodplain during flood event when no mining will take place.

Groundwater

No groundwater will be used during the mining operation.

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.

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

DESCRIBE ANY MINIMUM CLOSURE REQUIREMENTS IDENTIFIED BY THE LANDOWNER OR OTHER INTERESTED AND AFFECTED PARTIES (Attach written comments as appendices)
Non identified by landowner except for the overall description below
OVERALL DESCRIPTION OF THE MANNER IN WHICH THE LAND WILL BE REHABILITATED AND THE CONDITION IT WILL BE LEFT IN AFTER REHABILITATION HAS BEEN COMPLETED
<p>The environment affected by the mining operations 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. 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. 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.</p> <p>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 flood plain 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 site 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.</p> <p>Removal of these materials shall be done on a continuous basis and not only at the start of rehabilitation.</p> <p>All roads used will be repaired or rehabilitated if not needed by the landowner. All stockpiles will be removed and areas compacted by hauling operations will be ripped and profiled.</p>

4.1 Minimum closure objectives that will be adhered to

4.1.1 Rehabilitation of access roads

- Whenever a mining permit is suspended, cancelled or abandoned or if it lapses and the holder does not wish to renew the permit or right, any access road or portions thereof, constructed by the holder and which will no longer be required by the landowner/tenant, shall be removed and/or rehabilitated to the satisfaction of the Regional Manager.
- Any gate or fence erected by the holder which is not required by the landowner/tenant, shall be removed and the situation restored to the pre mining/prospecting situation.
- Roads shall be ripped or ploughed, and if necessary, appropriately fertilized (based on a soil analysis) to ensure the re-growth of vegetation. Imported road construction materials which may hamper re-growth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining operation, be corrected and the area be seeded with a seed mix to the Regional Manager's specification.

4.1.2 Rehabilitation of the office/ campsite

- On completion of operations, all buildings, structures or objects on the camp/office site shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002):
- Where office/camp sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- Areas containing French drains shall be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a vegetation seed mix to his or her specification.
- Photographs of the camp and office sites, before and during the mining/ prospecting operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager.

4.1.3 Rehabilitation of vehicle maintenance yard and secured storage areas

- On completion of mining/prospecting operations, the above areas shall be cleared of any contaminated soil, which must be dumped as referred to in section F 2.4.3 above.
- All buildings, structures or objects on the vehicle maintenance yard and secured storage areas shall be dealt with in accordance with section 44 of the Mineral and Petroleum Resources Development Act, 2002.
- The surface shall then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent the site, shall be spread evenly to its original depth over the whole area. The area shall then be fertilized if necessary (based on a soil analysis).
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

4.1.4 Rehabilitation of access to a river bed

- When rehabilitating the access point, the original profile of the river-bank will be re-established by backfilling the access point with the original material excavated or other suitable material.
- The topsoil shall then be returned over the whole area to its original depth and if necessary fertilized and the vegetation allowed to grow.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.
- 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 be the sole responsibility of the holder of the mining permit or prospecting right.
- Repair to the river-bank to reinstate its original profile to the satisfaction of the Regional Manager must take place immediately after such event has occurred and the river has subsided to a point where repairs can be undertaken.
- Final acceptance of rehabilitated river access points will be awarded only after the vegetation has re-established to a point where the Regional Manager is satisfied that the river-bank is stable and that the measures installed are of durable nature and able to withstand high river-flow conditions.

4.1.5 Rehabilitation of a mining area in the bed of a river

- The goal of rehabilitation with respect to the area where mining/prospecting has taken place in the river-bed 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 (see section F 2.3.2 above), whether these accrue directly from the mining/prospecting 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.
- Where reeds or other riverine vegetation have been removed from areas, these shall be re-established systematically in the approximate areas where they occurred before mining/prospecting.
- An effective control programme for the eradication of invader species and other exotic plants, shall be instituted on a regular basis over the entire mining/prospecting area under the control of the holder of the mining permit/ prospecting right, both during mining/prospecting and at the stage of final rehabilitation.

4.1.6 Rehabilitation of excavated areas

- The excavated area must serve as a final depositing area for the placement of tailings during processing.
- Rocks and coarse material removed from the excavation must be dumped into the excavation simultaneously with the tailings.
- Waste, as described in paragraph F 2.3.2 above, will not be permitted to be deposited in the excavations.
- Once excavations have been refilled with overburden, rocks and coarse natural materials and profiled with acceptable contours and erosion control measures, the topsoil previously stored, shall be returned to its original depth over the area.
- The area shall be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining/ prospecting operation, be corrected and the area be seeded with a vegetation seed mix to his or her specification.

4.1.7 Rehabilitation of processing areas

- Coarse natural material used for the construction of ramps must be removed and dumped into the excavations.
- On completion of mining/prospecting operations, the surface of the processing areas especially if compacted due to hauling and dumping operations, shall be scarified to a depth of at least 300mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.
- Prior to replacing the topsoil the material that was removed from the processing area will be replaced in the same order as it originally occurred.
- The area shall then be fertilized if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local, adapted indigenous seed mix.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining/prospecting operation be corrected and the area be seeded with a seed mix to his or her specification.

4.1.8 Final rehabilitation

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

5 REGULATION 52 (2) (b) and (c): Assessment and summary (Rating) of the potential impacts of the proposed operation on the environment,

5.1 Criteria used for the significance rating.

- 5.1.1 All surface disturbances are rated high
- 5.1.2 Dust is rated low if only minimal dust is expected to accumulate over the permit period, medium if it is expected to require dust suppression such as watering, and high if there is a risk that it will migrate beyond the permit area.
- 5.1.3 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.
- 5.1.4 All drainage is rated high
- 5.1.5 All blasting is rated high
- 5.1.6 All dust and noise from loading, hauling and transport is rated high
- 5.1.7 Drainage from ablution facilities are rated high.

This impact assessment only deals with significant impacts and as mining will take place within a floodplain that is covered in water during flood events and mining will only include the removal of a sandbank left behind after such a flood event the impact will be minimal.

The implementation of the mitigating and management measures prescribed in the EMP will address all the impacts and after implementation of the mitigating measures all impacts can be classified as insignificant

Geology

Significance/Magnitude	Duration	Probability	Timing
Low	Permanent	Certain	Activity

Due to the removal of all material for building purposes an excavation of maximum 2 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
Medium	Temporary	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 floodplain. The impact will however only be temporary until the next flood event.

Soils

Significance/Magnitude	Duration	Probability	Timing
Medium	Permanent	Certain	Activity

No topsoil is present within the flood plain and all material will be removed from the sand bank 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**
 Low 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 Temporary 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. The impact will however only be temporary until the next flood event when the area will be leveled again or the bedrock completely exposed depending on the flood volumes.

5.2 Significance rating

ACTIVITY Mark with X which activities are applicable		POTENTIAL IMPACT	SIGNIFICANCE RATING		
			LOW	MEDIUM	HIGH
Excavations	X	Surface disturbance			X
		Dust	X		
		Noise	X		
		Drainage		X	
Blasting		Fly Rock			
Stockpiles		Surface disturbance			
		Dust			
		Drainage			
Discard dumps or dams		Surface Disturbance			
		Dust			
		Drainage			
Loading, hauling and transport	X	Noise	X		
		Dust	X		
Water supply dams and boreholes.		Surface disturbance			
Accommodation, offices, ablution, stores, workshops etc.		Surface disturbance			
		Drainage			
Processing Plant		Noise			
		Dust			
		Drainage			
		Surface disturbance			
OTHER (Specify)					

5.3 REGULATION 52 (2) (c) Proposed mitigation measures to minimise adverse impacts. Technical or management options chosen.

ACTIVITY Mark with X which measures are applicable	MITIGATION MEASURE	DESCRIPTION OF THE MEASURE TO BE PUT IN PLACE (e.g.: Stockpiles will be thoroughly soaked once per day. e.g . Excessive dust on roads will be collected monthly and mixed into fill of excavations. e.g. Storm water trenches will be constructed with the necessary settling dams to separate clean and dirty water)	
Excavations	X	Rehabilitation	<p>The goal of rehabilitation with respect to the area where mining has taken place in the flood plain 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. The flood plain will be levelled and all excavations filled after each flood event. 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 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. All roads used will be repaired or rehabilitated if not needed by the landowner.</p>
		Dust control measures	
		Noise control measures	
	X	Storm water system	<p>Construct waste collection points and remove all solid waste from site and dispose of at municipal waste site on a weekly basis (do not bury or burn on site) Collect all workshop waste and oil in used oil storage area, and have oils and oil wastes collected by refining agency such as Oilkol or despatch to nearest depot. Construct domestic and industrial temporary storage facility with pollution control measures</p>
Blasting		Access control measures	
Stockpiles		Rehabilitation	
		Dust Control Measures	
		Storm water system	
Discard dumps or dams		Rehabilitation	
		Dust control Measures	
		Storm water system	

Loading, hauling and transport	X	Noise control measures	No mitigating necessary due to the small scale of operations and remote locality
	X	Dust control Measures	No mitigating necessary due to the small scale of operations and remote locality
Water supply dams and boreholes.		Rehabilitation	
Accommodation, offices, ablution, stores, workshops etc.	X	Rehabilitation	Only one mobile chemical toilet will be available for use during operations that will be removed at final closure
Processing Plant		Noise control measures	
		Dust control Measures	
		Storm water system	
		Rehabilitation	
OTHER (Specify)	Waste Management	X	Domestic Waste 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: <ul style="list-style-type: none"> • Provide waste collection drums at strategic points. • Demarcate an area for and constructed as "temporary waste storage area" for temporary collection and storage of the drums, prior to delivery to disposal site for disposal. (On-site dumping/burial is not allowed). • Instruct staff on the distinction between domestic refuse and industrial waste.
		X	Industrial Waste Identify and demarcate (by fences) the following sites: <ul style="list-style-type: none"> • Temporary storage area for all used lubrication products and other hazardous chemicals
		X	Diesel and Lubricant Handling Refuelling: Refuelling of equipment from the trailer bowser will be conducted by using a PVC facility or drip trays. Staff will require instruction in the identification of oil leaks the operation of the oil trap (including the disposal of trapped oil) and use of Spillsorb (or equivalent) products. On-site repairs: All repairs which are to take place on site will take place in the service bay. The service bay will be constructed with PVC facility. The apron will be constructed with a drain along its extremities to collect any oil contaminated run-off and channel it to the oil trap where separated oil will be collected and disposed of in the oil recycling container. Any

				<p>oil spills on the floor is to be treated with Spillsorb (or equivalent) as per the product instructions. Waste oils from servicing of vehicles will be disposed of in the waste oil collection facility.</p> <p>Staff will require instruction in the:</p> <ul style="list-style-type: none"> • deleterious effects of oil /fuel on the environment • identification of oil leaks on the concrete apron • the operation of the oil trap (including the disposal of trapped oil) • use of Spillsorb (or equivalent) products <p>Collection of contaminated spares and waste oils: 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.</p> <p>Staff will require instruction in:</p> <ul style="list-style-type: none"> • deleterious effects of oil / fuel on the environment • location and method of the storage of contaminated spares <p>Temporary storage: Used oils will be stored in drums provided by the oil recycling companies such as Oilkol. A demarcated area 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.</p> <p>Staff will require instruction in:</p> <ul style="list-style-type: none"> • deleterious effects of oil / fuel on the environment • location and method of the storage of contaminated spares and used oil <p>Off-site disposal by a recycling company: All waste oils must be collected in the facility for collection by a waste oil recycling company. Instruct the staff in the reasons for good fuel management and the alternative consequences.</p>
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5.4 Regulation 52 (2) (c): Measures to address impacts identified by Interested and affected parties.

LIST THE POTENTIAL IMPACTS IDENTIFIED BY INTERESTED AND AFFECTED PARTIES AS RECORDED IN PARAGRAPH 1.3 ABOVE.	DESCRIBE THE MANNER IN WHICH THE IMPACTS IDENTIFIED BY INTERESTED AND AFFECTED PARTIES WILL BE ADDRESSED
None	No additional impacts except for the ones in the consultation template

In cases where a need for monitoring has been identified provide detail below. (Explain what will be monitored, how it will be monitored, by whom it will be monitored, and how frequently it will be monitored).

I will, on a bi-monthly basis, check every aspect of my operation against the prescriptions given in this document and, if I find that certain aspects are not addressed or impacts on the environment are not mitigated properly, I will rectify the identified inadequacies immediately. Regular monitoring of all the environmental management measures and components shall be carried out to ensure that the provisions of this program are adhered to.

Inspections and monitoring shall be carried out on both the implementations of the program and the impact on the environment. Visual inspections on erosion and physical pollution shall be carried out on a regular basis.

Layout plans will be updated on a regular basis and updated copies will be submitted on an annual basis to the Regional Manager together with a performance assessment and update of the financial provision for rehabilitation.

Reports confirming compliance with various points identified in the environmental management program will be submitted to the Regional Manager on a regular basis and as decided by the said manager.

Any emergency or unforeseen impact will be reported as soon as possible. An assessment of environmental impacts that were not properly addressed or were unknown when this program was compiled shall be carried out and added as a corrective action.

An open line of communication will also be kept with all interested and affected parties including the landowner during the life of the operation and any new input will be communicated to DME and recorded and addressed in the EMP.

5.5 Minimum operational standards that will be adhered to for environmental management

5.5.1 The relevant legislative provisions of the following will be adhered to

- National Monuments Act 1969 (Act 28 of 1969).
- National Parks Act, 1976 (Act 57 of 1976)
- Environmental Conservation Act, 1989 (Act 73 of 1989)
- National Environmental Management Act, 1998 (Act No. 107 of 1998)
- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965)
- The National Water Act, 1998 (Act 36 of 1998)
- Mine Safety and Health Act, 1996 (Act 29 of 1996)
- The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).

5.5.2 Demarcation of the mining area and restrictions

- 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.
- The mining of and prospecting for any mineral shall only take place within this demarcated mining area.
- If riverine vegetation is present in the form of reeds or wetland vegetation, the presence of these areas must be entered in Part C 1.45 of the EMPlan and indicated on the layout plan.
- On assessment of the application, the Regional Manager may prohibit the conducting of mining or prospecting operations in vegetated areas or over portions of these areas

5.5.3 Topsoil

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

5.5.4 Access roads on the site

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

5.5.5 Maintenance of access roads

- In the case of dual or multiple use of access roads by other users, arrangements for multiple responsibility must be made with the other users. If not, the maintenance of access roads will be the responsibility of the holder of the mining permit.
- Newly constructed access roads shall be adequately maintained so as to minimize dust, erosion or undue surface damage.

5.5.4 Dust control on the access and haul roads

- The liberation of dust into the surrounding environment shall be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.

5.5.5 Office sites

- Office sites shall be established, as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the mining/ prospecting area.
- The area chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation
- No camp or office site shall be located closer than 100 metres from a stream, river, spring, dam or pan.
- No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner/tenant.
- Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break shall be cleared around the perimeter of the camp and office sites.

- Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner/tenant/persons lawfully living in the vicinity shall be kept to a minimum.

5.5.6 Toilet facilities, waste water and refuse disposal

- As a minimum requirement, the holder of a mining permit shall, at least, provide pit latrines for employees and proper hygiene measures shall be established.
- Chemical toilet facilities or other approved toilet facilities such as a septic drain shall preferably be used and sited on the camp site in such a way that they do not cause water or other pollution.
- The use of existing facilities must take place in consultation with the landowner/tenant.
- In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to.
- All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 metres, from any stream, river, pan, dam or borehole.
- Only domestic type wash water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility.
- Spills will be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility.
- Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., shall be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognized disposal facility. Specific precautions shall be taken to prevent refuse from being dumped on or in the vicinity of the camp site.
- Biodegradable refuse generated from the office/camp site, processing areas vehicle yard, storage area or any other area shall either be handled as indicated above or be buried in a pit excavated for that purpose and covered with layers of soil, incorporating a final 0,5 metre thick layer of topsoil (where practicable). Provision should be made for future subsidence of the covering.

5.5.7 Vehicle maintenance yards, storage areas and equipment.

- Any vehicle maintenance yard and secured storage area will be established as far as is practicable, outside the flood plain, above the 1 in 50 flood level mark within the boundaries of the mining/prospecting area.
- The area chosen for these purposes will be the minimum reasonably required and involve the least disturbance to tree and plant life
- The storage area shall be securely fenced and all hazardous substances and stocks such as diesel, oils, detergents, etc., shall be stored therein. Drip pans, a thin concrete slab or a facility with PVC lining, shall be installed in such storage areas with a view to prevent soil and water pollution.
- The location of both the vehicle maintenance yard and the storage areas are to be indicated on the layout plan.
- No vehicle may be extensively repaired in any place other than in the maintenance yard.
- The maintenance of vehicles and equipment used for any purpose during the mining operation will take place only in the maintenance yard area.
- Equipment used in the mining process will be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.
- Machinery or equipment used on the mining area will not be allowed to constitute a pollution hazard in respect of the above substances.
- The Regional Manager may order such equipment to be repaired or withdrawn from use if he or she considers the equipment or machinery to be polluting and irreparable.

5.5.8 Waste disposal

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

5.5.9 Limitations on mining

- The mining of minerals or precious stones shall take place only within the approved demarcated mining or prospecting area.
- Mining will be limited to the areas indicated as excavations on the plan provided in terms of paragraph 2 herein.
- Operations will not be conducted closer than one and a half times the height of the bank from the edge of the river channel and in such manner that the stability of the bank of the river is affected.
- Precautions shall also be taken to ensure that the bank of the river is adequately protected from scouring or erosion.
- Damage to the bank of the river caused by the operations, will be rehabilitated to a condition acceptable to the Regional Manager at the expense of the holder.
- Restrictions on the disturbance of riverine vegetation in the form of reeds or wetland vegetation must be adhered to. The presence of these areas must be shown on the plan required in terms of paragraph 3 herein.

5.5.10 Mining operations within a riverine environment

- The mining of minerals and/or precious stones in the river or the banks of the river will be undertaken only if paragraphs 1.2 and 1.3 above show that the Department of Water Affairs and Forestry has been consulted, only if the best practice guideline for small scale mining developed by DWAF (BPG 2.1) is attached hereto, and only in accordance with such guideline, and any additional conditions that that Department may impose.
- The canalisation of a river will not be undertaken unless the necessary permission has been obtained from the Department of Water Affairs and Forestry. Over and above the conditions imposed by the said Department, which conditions shall form part of this EMPlan, the following will also apply:
 - ❖ The canalisation of the flow of the river over different parts of the river bed shall be constructed in such a manner that the following are adhered to at all times:
 - ◆ The flow of the river may not be impeded in any way and damming upstream may not occur.
 - ◆ The canalisation of the flow may not result in scouring or erosion of the river-bank.
 - ◆ Well points or extraction pumps in use by other riparian users may not be interfered with and canalisation may not impede the extraction of water at these points.
- Access to the riverbed for the purpose of conducting excavations in the river-bed, shall be through the use of only one access at a time. The location of the access to the river channel across the river-bank shall be at a point of the river-bank where the least excavation and damage to vegetation will occur and shall not be wider than is reasonably required. The position of the river access together with all planned future access points, must be indicated on the layout plan.
- Mining will be conducted only in accordance with the Best Practice Guideline for small scale mining that relates to stormwater management, erosion and sediment control and waste management, developed by the Department of Water Affairs and Forestry (DWAF), and any other conditions which that Department may impose.

5.5.11 Establishing the excavation areas

- Whenever any excavation is undertaken for the purpose of locating and/or extracting ore bodies of all types of minerals, including precious stone-bearing gravels, the following operating procedures shall be adhered to:
 - ❖ Excavations shall take place only within the area indicated on the plan provided in terms of paragraph 2 herein..
 - ❖ Overburden rocks and coarse material shall be placed concurrently in the excavations or stored adjacent to the excavation, if practicable, to be used as backfill material once the ore or gravel has been excavated.
 - ❖ Trenches shall be backfilled immediately if no ore or precious stone-bearing gravel can be located.

5.5.12 Establishing processing areas, waste piles, tailings dams or slimes dams.

- Processing areas waste piles, tailings dams or slimes dams, will not be established within 100 metres of the edge of any river channel or other water bodies.
- Processing areas will be established, as far as practicable, near the edge of excavations to allow the waste, gravel and coarse material to be processed therein.
- The areas chosen for this purpose will be the minimum reasonably required and involve the least disturbance to vegetation.
- Prior to development of these areas, the topsoil will be removed and stored as described in paragraph F 2.1 above.
- Processing area, waste piles tailings dams or slimes dams will not be established unless the location and dimensions of the areas are clearly indicated on the plan referred to in paragraph 2 herein, and once established, the processing of minerals or ore containing precious stones shall be confined to these areas and no stockpiling or processing will be permitted on areas not correctly prepared.
- Tailings from the extraction process must be so treated and/or deposited that it will in no way prevent or delay the rehabilitation process.

6 REGULATION 52 (2) (e): Planned monitoring of the environmental management plan.

IDENTIFICATION	Mark with an X where applicable	
	YES	NO
Have the interested and affected parties identified that noise must be monitored?		X
Have the interested and affected parties identified that dust must be monitored?		X
Have the interested and affected parties identified that water quality must be monitored?		X

7 Environmental awareness plan.

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.

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.

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

8.1 Information for Quantum calculation.

LIST OF ACTIVITY AREAS ON SITE	Mark with X where applicable		State the area of the activity in m ²	State the volume of the activity in m ³
	YES	NO		
Excavations	X		10 000	16 000
Stockpiles	X		1 000	
Discard dumps				
Discard dams				
Loading areas				
Water supply dams				
Accommodation areas				
Offices or buildings				
Workshops				
Access roads				
Other (Specify)				
TOTAL AREA and /or volume to be rehabilitated			11 000	16 000

8.2 Undertaking to provide financial provision

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 Kakamas.

Rehabilitation of excavation area

After mining the whole excavation area can be regarded as part of the flood plain. 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 area 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.

Only reeds occur in the proximity of the floodplain. Rocks and coarse material removed from the excavation will be spread evenly over the bed of the river.

Extent:	1.5 Ha
Duration of rehabilitation:	16 hours
Equipment required:	
Front end loader for removal of stockpile and overburden dump 16 h X R500.00/h	R 8 000.00
Ripping and profiling 16 h X R500.00/h	R 8 000.00
Cost of rehabilitation:	R16 000.00

Rehabilitation of processing areas

No processing areas will be present and no stockpiling areas.

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:	1.5 Ha
Duration of rehabilitation:	4 hours
Equipment require:	
Manual labour for removal of material and containers	R10 000.00
Transport of material	R 2 000.00
Cost of rehabilitation:	R 12 000.00

Total cost of rehabilitation:

Rehabilitation of excavation area	R16 000.00
Final rehabilitation	R12 000.00
Total	R28 000.00

The applicant is willing to escalate the estimated amount of R28 000.00 to R30 000.00 and financial provision required under Regulation 54 for the amount of R30 000.00 that is more than 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.

9 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, I herewith confirm that the above report comprises the EMP compiled in accordance with directive, in terms of sections 29 of the Act contained herein, and that the Environmental management plan will be executed as proposed should the permit be issued. I acknowledge that since this Environmental Management Plan is specific to the scale of the mining operation in the hands of the applicant/holder, the operation of the mine specifically by the holder in the manner and scale proposed in the applicable financial and technical ability report and in this Environmental management plan constitute material terms and conditions of the permit, and any change in the scope of the work or the party operating the mine, albeit on a subcontracting or subletting basis, will constitute a contravention contemplated in section 47(1) of the Act.

Full Names and Surname	Johannes Rudolph Spangenberg
Identity Number	5505055089083

-END-