

POSTMASBURG MANGANESE & IRON ORE PROJECT 1, NORTHERN CAPE DRAFT ENVIRONMENTAL MANAGEMENT PLAN

PREPARED FOR: DEPARTMENT OF MINERAL RESOURCES

DMR REFERENCE: NC 30/5/1/1/2/10975 PR

STATUS DRAFT

ON BEHALF OF: LEAGO MINING AND INFRASTRUCTURE INVESTMENTS PTY
(LTD)

PREPARED BY: NKULULEKO MZOBE

DATE: OCTOBER 2013



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

NAME OF APPLICANT: LEAGO MINING AND INFRASTRUCTURE INVESTMENTS (PTY)
LTD

REFERENCE NUMBER: NC 30/5/1/1/2/10975 PR

ENVIRONMENTAL MANAGEMENT PLAN

SUBMITTED

**IN TERMS OF SECTION 39 AND OF REGULATION 52
OF THE MINERAL AND PETROLEUM RESOURCES
DEVELOPMENT ACT, 2002,**

(ACT NO. 28 OF 2002) (the Act)

STANDARD DIRECTIVE

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

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

ITEM	COMPANY CONTACT DETAILS
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Cellular no	071 492 7286
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ITEM	CONSULTANT CONTACT DETAILS (If applicable)
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EXECUTIVE SUMMARY

The area initially applied for included 5 farms. A letter was written to the DMR requesting to exclude the farm Drooge Kloof 58 from the application. The decision to exclude the farm was based on the field visit which proved that the farm is environmentally highly sensitive and has a high scarcity of water. It was also noted that the landowners are familiar with some of the names as they appear on the DMR system. A spatial matching was done so that the names in the DMR system and the local names used by the landowners are identified so as to be accurate in the public participation process. The table below matches the farm names as they appear on the DMR system with the names that are used by the landowners. Below is also a satellite image showing the area in question.

NAME ON DMR SYSTEM	NAME USED BY LANDOWNERS	LANDOWNER	STATUS
Remaining Extent of Plaas 656	Merino	Mr J.F. Jacobs	Pursued for granting
Remaining Extent of Plaas 657	Lockshoek	Mr J.P. Van der Linde	Pursued for granting
Portion 1 of Plaas 53	Duitseput	Mr C. Viljoen	Pursued for granting
Remaining Extent of Achembach Puts 56	Achembach Puts	Mr A. Barnard	Pursued for granting
Remaining Extent of Drooge Kloof 58	Drooge Kloof	Mr T. Vlok	Not pursued for granting

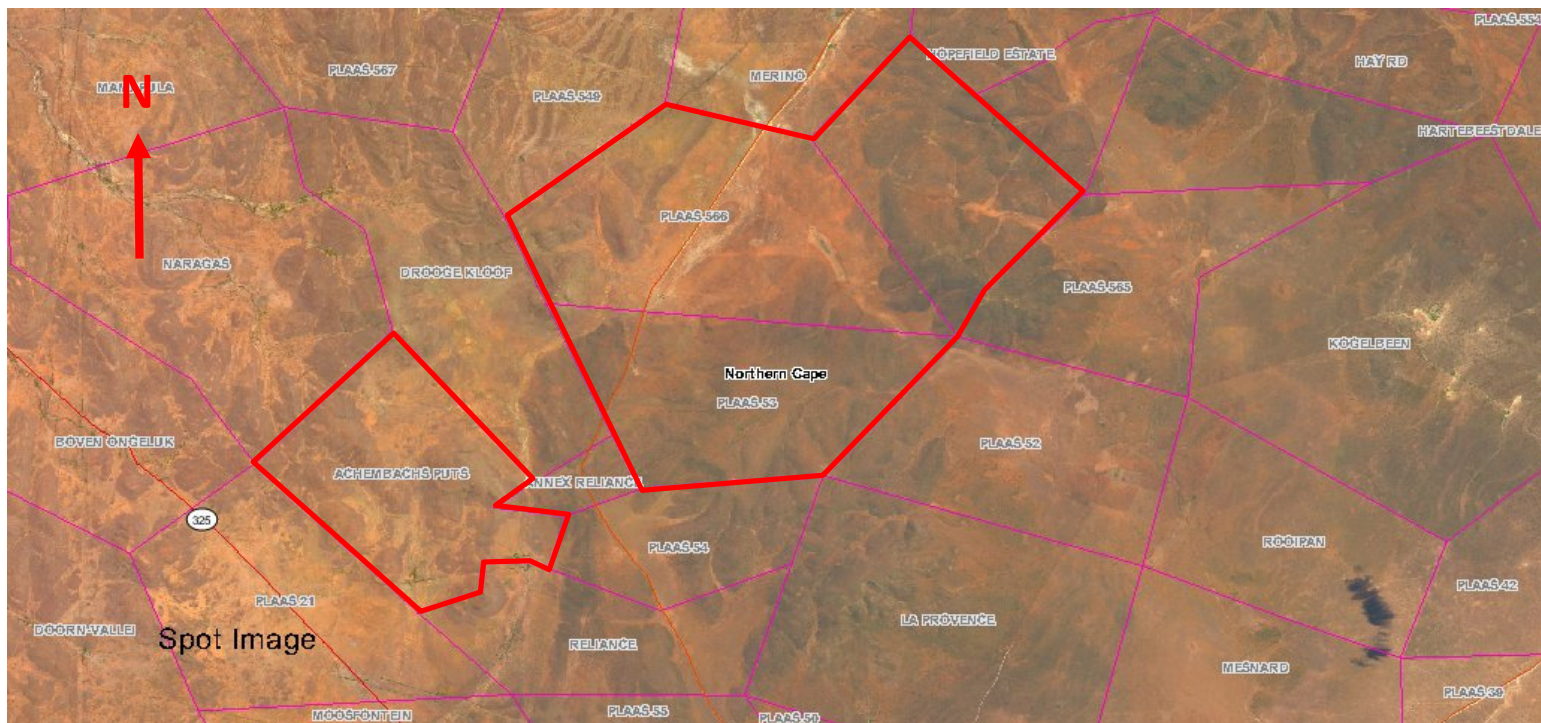


Figure 1. Satellite image showing the area under application

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.

Surface water

There are no major rivers or dams in the proposed project area, however there tributaries that run through farms in the project area

Soil

The common soil type in the area is LP2 soils with minimal development usually shallow on hard or weathering rock with or without intermittent diverse soils. Lime generally present in part or most of the landscape. The other common soil type is CM red soil with high base status.

Vegetation and land cover

The map vegetation biome in the proposed project area is the Savanna. The map below shows the vegetation biomes.

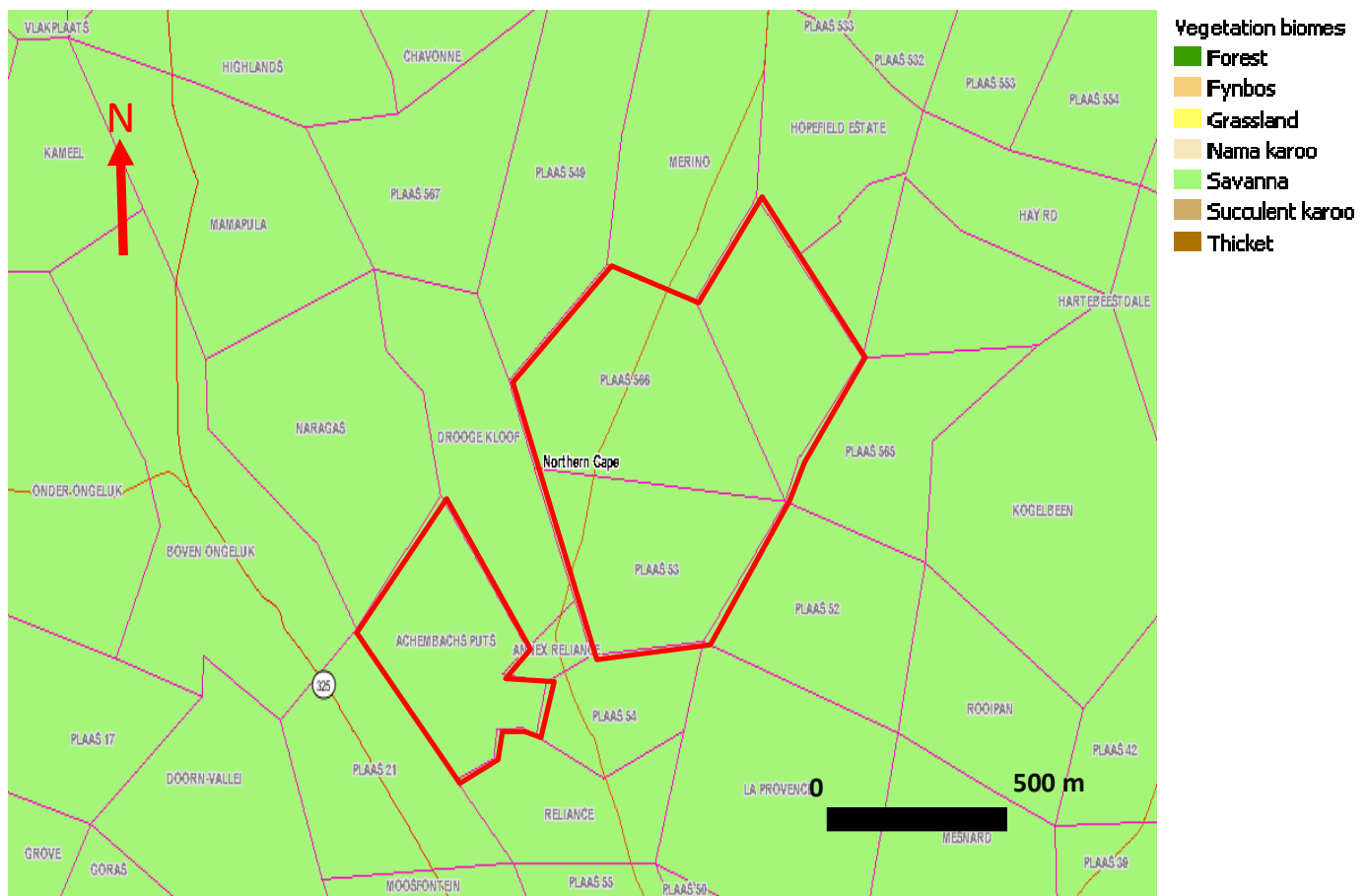


Figure 2. Map showing vegetation biomes

Geology

The rocks in the area are of the Transvaal Supergroup. The area is on the southern limb of Ongeluk Anticline with mainly banded iron formation and carbonate rocks.

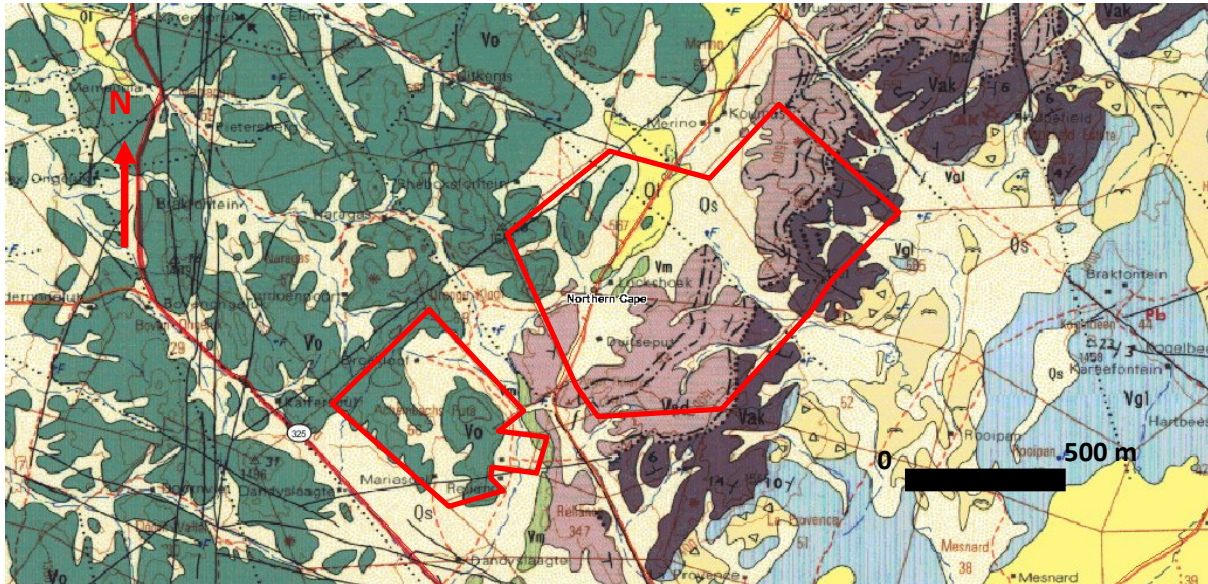


Figure 3. Map showing the geology of the area under application.

Land use and land capability

The land is mainly used for agricultural purposes. The main activity is cattle farming and goat farming.



Figure 4. Photo showing cattle

Heritage and cultural site

There are no sites of cultural or heritage importance have been identified in the proposed project area.

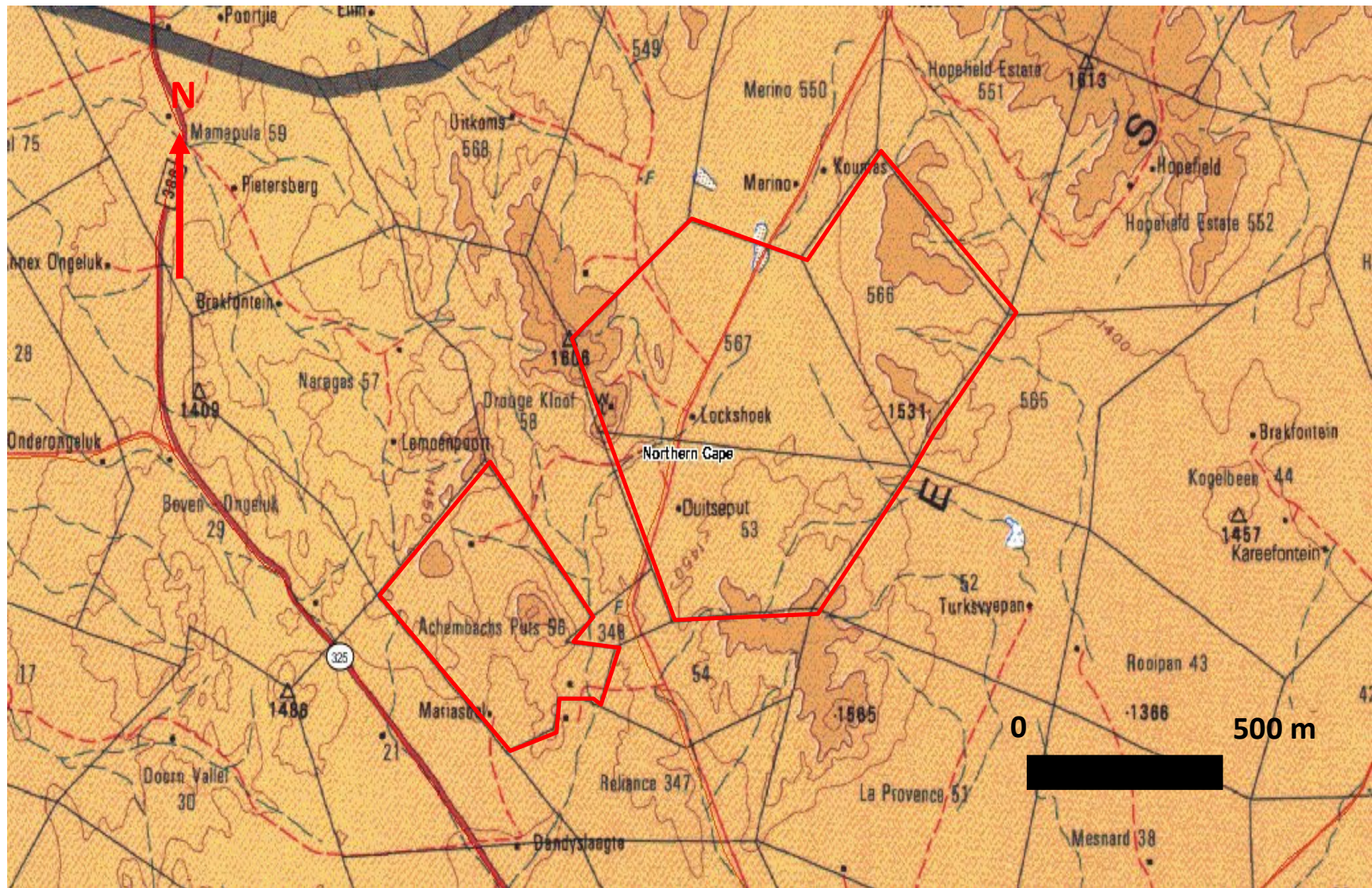
1.2. The specific environmental features on the site applied for which may require protection, remediation, management or avoidance.

The table below tabulates all identified environmental features on site and the appropriate proposed mitigation. For the features that need buffering and buffer distance has been set.

ENVIRONMENTAL FEATURE	TYPE OF MITIGATION	BUFFER DISTANCE
Populated areas	Avoidance	
Wetlands	Protection	200 m
Surface water	Protection	100 m
Cultural/Archaeological Heritage Sites	Protection	100 m
Public Roads	Protection	100 m
Geology	Management	
Soil	Management	
Vegetation	Management	
Land use and land capability	Management	
Biodiversity	Protection	
Groundwater	Management	
Air quality	Management / Remediation	
Visual and aesthetic aspects	Management	
Noise	Management	
Sensitive landscapes	Management	
Socio-economic aspects	Management	
Access, traffic and transport	Management	

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

The spatial locality of the environmental, cultural/heritage and current land use identified has been shown in the variety of maps displayed in previous sections.



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 description of the environment has been compiled with the participation of landowners and other interested and affected parties. Meetings were held with land owners individually and with the Siyancuma Local Municipality during the month of October 2013. Please see the comment forms in the appendix section.

2. REGULATION 52 (2) (b): Assessment of the potential impacts of the proposed prospecting or mining operation on the environment, socio- economic conditions and cultural heritage.

2.1. Description of the proposed prospecting or mining operation.

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

Access roads: there will be no access roads created since there are existing road that will be used to access drill sites.

Camp site: there will be no camp site, there drilling crew will be accommodated at lodges in the town of Griekwastad. This is to minimize the environmental impact cause by site preparation.

Sumps: there will a total of five (5) sumps dug in the proposed project. The sumps will be dug by hand using pick and shovels. The dimensions of the sumps will be approximately 1.5 m x 1.5 m x 1 m. There will be one (1) sump per drill hole.

Topsoil storage: there will be five (5) topsoil storage sites created. These will be for storing the soil dug from the five (5) sumps. The topsoil will be stored in 1.5 m high piles to decrease the effect of compaction. A 5 m working buffer will be set to avoid disturbance and mixing of the topsoil.

Drill sites: there will be five (5) drill sites set up. These will be approximately 1000 square meters in size. This will allow for placing of the drill rig, sumps, small core logging tent and on-site core storage. The drill will be set up by hand using basic tools such as pick, shovels and hammer, no heavy equipment or excavators will be used.

Drill holes: there will be five (5) holes drill. Each hole with a 60 mm diameter and not exceeding 250m of depth. The holes will be drilled using a truck mounted drill rig that drills a 60 mm diameter hole and will spend approximately one (1) week per drill hole.

2.1.2. Plan of the main activities with dimensions.

Below are the dimensions of the main activities. The aerial photograph serves a plan showing the proposed location of the main activities. It should be noted that these are preliminary and will be finalized once a full desktop study has been done.

- Drill site: each drill site will be approximately 1000 square meters
- Drill hole: diameter of 60 mm and depth of no deeper than 120m
- Sumps: 1.5 m X 1.5 m X 1 m
- Topsoil storage: 1.5 m high piles

2.1.3. Description of construction, operational, and decommissioning phases.

Construction Phase

Rig Mobilization

A rig will be transported to the drill site. It will take approximately one (1) day for the rig to be assembled on first site.

Drill Site Establishment

There will be five (5) drill sites establishes each approximately 1000 square meters in size. These will be fenced and demarcated. They will all be fitted with safety signs and PPE requirements, emergency alarm, first aid kit, fire extinguisher and Material Safety Data Sheet (MSDS) for all toxic material used on site. Five (5) sumps will be dug, one (1) each camp site and topsoil stored accordingly. A waste area will be demarcated and a chemical toilet will be erected.

Operation Phase

This phase will entail drilling which is the actual extraction of cored rock samples from beneath the surface. This will be done using a rig that applies a rotation motion and pressure into the ground and therefore penetrating the rock formation. The rock sample is then extracted via an inner tube as core. The core will be transported from site to the designated core yard. The drilling will take approximately one (1) week per drill hole.

Decommissioning Phase

- Rid Demobilization
- Removal of all foreign material from all sites and camp
- Removal of all waste
- Removal of chemical toilet
- Dismantling of all fences and gates that were erected
- Sealing and capping of drill holes
- Backfill of all dug sumps
- Ripping of all compacted surfaces
- Re vegetation and seeding

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

There are no NEMA listed activities that will be triggered by the proposed project.

2.2. Identification of potential impacts (Refer to the guideline)

2.2.1. Potential impacts per activity and listed activities.

PHASE	POTENTIAL IMPACT
CONSTRUCTION (SITE ESTABLISHMENT)	Loss of the soil resource due to clearing of topsoil for drill site set-up
	Loss of soil integrity due to movement of vehicles, excavations, removal and stockpiling of soil
	Soil compaction due to heavy vehicle movement, excavation of sumps and soil removal and restoration
	Soil contamination and pollution due to spillages
	Erosion due to vegetation clearing
	Land capability and land use disturbance at drill site
	Loss of fauna and flora at drill sites
	Collision with fauna species on roads
	Disturbance of fauna due to noise, dusts and light
	Increases erosion and runoff volumes due to removal of vegetation and topsoil
	Polluted run-off from drill sites
	Flooding of drill sites
	Reduction in groundwater recharge
	Leakage of fuels leading to deterioration of groundwater quality at the site
	Air quality
	Visual aspects
Noise	

	Archaeology / cultural heritage / paleontology aspects
	Impact on sensitive landscapes
	Loss of land and impact on livelihood
	Presence of workers
	Employment
	Access, traffic and transport
OPERATION (DRILLING)	Impact on geology
	Soil contamination and pollution due to spillages
	Collision with fauna species on roads
	Disturbance of fauna due to noise, dusts and light
	Polluted run-off from drill sites
	Spills and leaks of drilling return flow fluid
	Possible abstraction of surface water as a source of water supply
	Water storage tanks leak/collapse/burst leading to contamination of aquifer
	Pumps/pipes to/from storage tanks to drill rig fail resulting in spillage
	Leakage of stored drilling fluids leading to deterioration of groundwater quality at the site
	Intersection of aquifers
	Intersection of significant fracture zone
	Failure of steel casing and cement grout – groundwater inflow
	Inflow of groundwater into the drill hole resulting in lower water levels
	Drilling of water drills as an option to obtain a groundwater supply
	Abstraction of groundwater for water supply for drilling
	Air quality
	Visual aspects
	Noise
	Socio-economic impacts
Access, traffic and transport	
Impact on geology	
Soil contamination and pollution due to spillages	
DECOMMISSIONING	Soil contamination
	Land capability and land use
	Colonization of the site by invasive alien plant species
	Polluted runoff leaving the site
	Leakage and spillage of contaminated water during transport to selected disposal site
	Spillages and residues during and after site clean up
	Inadequate sealing of drill hole
	Inadequate sealing of water supply boreholes
	Air quality
	Visual aspects
	Noise

2.2.2. Potential cumulative impacts.

Surface disturbance

Due to the relatively small area of surface disturbance associated with the drill site preparation and exploration drilling a, it is not anticipated that these exploration activities will contribute significantly to any existing cumulative impacts on the environment. This will, however, be verified once the drilling sites have been selected and aspects such as current land use, and future mining and infrastructural developments, are taken into consideration.

Traffic and Water

Due to the relatively small area of surface disturbance associated with the drill site preparation and exploration drilling a, it is not anticipated that these exploration activities will contribute significantly to any existing cumulative impacts on the environment. This will, however, be verified once the drilling sites have been selected and aspects such as current land use, and future mining and infrastructural developments, are taken into consideration.

2.2.3. Potential impact on heritage resources.

There are no sites of heritage resources.

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

PHASE	POTENTIAL IMPACT
CONSTRUCTION (SITE ESTABLISHMENT)	Loss of the soil resource due to clearing of topsoil for drill site set-up
	Loss of soil integrity due to movement of vehicles, excavations, removal and stockpiling of soil
	Soil compaction due to heavy vehicle movement, excavation of sumps and soil removal and restoration
	Soil contamination and pollution due to spillages
	Erosion due to vegetation clearing
	Land capability and land use disturbance at drill site
	Loss of fauna and flora at drill sites
	Collision with fauna species on roads
	Disturbance of fauna due to noise, dusts and light
	Increases erosion and runoff volumes due to removal of vegetation and topsoil
	Polluted run-off from drill sites
	Flooding of drill sites
	Reduction in groundwater recharge
	Leakage of fuels leading to deterioration of groundwater quality at the site
	Air quality
	Visual aspects
Noise	
Archaeology / cultural heritage / paleontology aspects	
Impact on sensitive landscapes	

	Loss of land and impact on livelihood
	Presence of workers
	Employment
	Access, traffic and transport
OPERATION (DRILLING)	Impact on geology
	Soil contamination and pollution due to spillages
	Collision with fauna species on roads
	Disturbance of fauna due to noise, dusts and light
	Polluted run-off from drill sites
	Spills and leaks of drilling return flow fluid
	Possible abstraction of surface water as a source of water supply
	Water storage tanks leak/collapse/burst leading to contamination of aquifer
	Pumps/pipes to/from storage tanks to drill rig fail resulting in spillage
	Leakage of stored drilling fluids leading to deterioration of groundwater quality at the site
	Intersection of aquifers
	Intersection of significant fracture zone
	Failure of steel casing and cement grout – groundwater inflow
	Inflow of groundwater into the drill hole resulting in lower water levels
	Drilling of water drills as an option to obtain a groundwater supply
	Abstraction of groundwater for water supply for drilling
	Air quality
	Visual aspects
	Noise
	Socio-economic impacts
Access, traffic and transport	
Impact on geology	
Soil contamination and pollution due to spillages	
DECOMMISSIONING	Soil contamination
	Land capability and land use
	Colonization of the site by invasive alien plant species
	Polluted runoff leaving the site
	Leakage and spillage of contaminated water during transport to selected disposal site
	Spillages and residues during and after site clean up
	Inadequate sealing of drill hole
	Inadequate sealing of water supply boreholes
	Air quality
	Visual aspects
	Noise

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

The potential impacts have been compiled with the participation of the landowner and interested and affected parties.

2.2.6. Confirmation of specialist report appended. (Refer to guideline)

There has been no specialist report to date.

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

3.1. Assessment of the significance of the potential impacts.

3.1.1. Criteria of assigning significance to potential impacts.

The criteria of assigning significance to potential impacts were determined using the approach outlined below. These use two aspects namely occurrence and severity, which can be further, sub-divided as follows:

OCCURRENCE		SEVERITY	
Probability of occurrence	Duration of occurrence	Magnitude of impact	Scale/ extent of impact

To assess each impact, the following four ranking scales were used:

PROBABILITY		DURATION	
5 - Definite/don't know		5 - Permanent	
4 - Highly probable		4 - Long-term (more than 15 years)	
3 - Medium probability		3 - Medium-term (8-15 years)	
2 - Low probability		2 - Short-term (0-7 years)	
1 - Improbable		1 - Immediate	
0 - None			
SCALE		MAGNITUDE	
5 - International		10 - Very high/don't know	
4 - National		8 - High	
3 - Regional		6 - Moderate	
2 - Local		4 - Low	

1 - Site only	2 - Minor
0 - None	

The interaction between the probability, scale, duration and magnitude defines the significance of the impact on a given environmental aspect. The significance of the two aspects occurrence and severity is assessed using the following formula:

SP (significance points) = (probability + duration + scale) x magnitude.

The maximum value is 150 significance points. The impact significance is then rated as follows:

SP >75	Indicates high environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30 – 75	Indicates moderate environmental significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated.
SP <30	Indicates low environmental significance	Impacts with little real effect and which should not have an influence on or require modification of the project design.
+	Positive impact	An impact that is likely to result in positive Consequences/effects

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

PHASE	POTENTIAL IMPACT	SIGNIFICANCE ASSESSEMENT
Drill establishment site	Cutting of topography to level the ground for the drill rig positioning	Low
	Loss of the soil resource due to clearing of topsoil for drill site set-up	High

	Loss of soil integrity due to movement of vehicles, excavations, removal and stockpiling of soil	Moderate
	Soil compaction due to heavy vehicle movement, excavation of sumps and soil removal and restoration	Moderate
	Soil contamination and pollution due to spillages	Low
	Erosion due to vegetation clearing	Low
	Land capability and land use disturbance at drill site	Moderate
	Loss of fauna and flora at drill sites	Low
	Collision with fauna species on roads	Moderate
	Disturbance of fauna due to noise, dusts and light	Moderate
	Increases erosion and runoff volumes due to removal of vegetation and topsoil	Low
	Polluted run-off from drill sites	Low
	Flooding of drill sites	Low
	Reduction in groundwater recharge	Low
	Leakage of fuels leading to deterioration of groundwater quality at the site	Low
	Air quality	Moderate
	Visual aspects	Moderate
	Noise	Low
	Archaeology / cultural heritage / paleontology aspects	High
	Impact on sensitive landscapes	Moderate
	Loss of land and impact on livelihood	Low
	Presence of workers	Low
	Employment	Low
	Access, traffic and transport	Moderate
Drilling	Impact on geology	Moderate
	Soil contamination and pollution due to spillages	Low
	Collision with fauna species on roads	Moderate
	Disturbance of fauna due to noise, dusts and light	Moderate
	Polluted run-off from drill sites	Low
	Spills and leaks of drilling return flow fluid	Low
	Possible abstraction of surface water as a source of water supply	Moderate
	Water storage tanks leak/collapse/burst leading to contamination of aquifer	Moderate
	Pumps/pipes to/from storage tanks to drill rig fail resulting in spillage	Moderate
	Leakage of stored drilling fluids leading to deterioration of groundwater quality at the site	Moderate
	Intersection of aquifers	High
	Intersection of significant fracture zone	Low
	Failure of steel casing and cement grout – groundwater inflow	Low
	Inflow of groundwater into the drill hole resulting in lower water levels	Moderate
	Drilling of water drills as an option to obtain a groundwater supply	Low
	Abstraction of groundwater for water supply for	Moderate

	drilling	
	Air quality	Moderate
	Visual aspects	Moderate
	Noise	Moderate
	Socio-economic impacts	Low
	Access, traffic and transport	Moderate
Decommissioning	Soil contamination	Moderate
	Land capability and land use	Low
	Colonization of the site by invasive alien plant species	Low
	Polluted runoff leaving the site	Low
	Leakage and spillage of contaminated water during transport to selected disposal site	Low
	Spillages and residues during and after site clean up	Low
	Inadequate sealing of drill hole	Low
	Inadequate sealing of water supply boreholes	Low
	Air quality	Low
	Visual aspects	Low
	Noise	Low

3.1.3. Assessment of potential cumulative impacts.

PHASE	POTENTIAL IMPACT	SIGNIFICANCE ASSESSEMENT
Drill establishment site	Cutting of topography to level the ground for the drill rig positioning	Low
	Loss of the soil resource due to clearing of topsoil for drill site set-up	High
	Loss of soil integrity due to movement of vehicles, excavations, removal and stockpiling of soil	Moderate
	Soil compaction due to heavy vehicle movement, excavation of sumps and soil removal and restoration	Moderate
	Access, traffic and transport	Moderate
Drilling	Impact on geology	Moderate
	Soil contamination and pollution due to spillages	Low
	Socio-economic impacts	Low
	Access, traffic and transport	Moderate
Decommissioning	Soil contamination	Moderate
	Land capability and land use	Low
	Colonization of the site by invasive alien plant species	Low
	Polluted runoff leaving the site	Low
	Leakage and spillage of contaminated water during transport to selected disposal site	Low

	Spillages and residues during and after site clean up	Low
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3.2. Proposed mitigation measures to minimize adverse impacts.

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

- Drill and camp site establishment
- Drilling
- Sump digging
- Use of hydrocarbons and storage
- Waste

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

- Drill Site Selection
- Water Management Plan
- Decommissioning, Rehabilitation and Closure Plan
- Air Quality Management Plan
- Noise Management Plan
- Sediment and Erosion Control Plan
- Hazardous Materials Management Plan
- Non-Hazardous Solid Waste and Domestic Wastewater Management Plan
- Petroleum Management Plan
- Soils and Vegetation Management Plan
- Spill Prevention and Response Plan
- Transportation Management Plan
- Heritage/Archaeological Resources Management Plan
- Light Pollution Management Plan
- Occupational Health and Safety Plan

3.2.3. Review the significance of the identified impacts

(After bringing the proposed mitigation measures into consideration).

M= Magnitude
D= Duration

S= Severity
P= Probability
SP= Significance Points

POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE											
	BEFORE MITIGATION						AFTER MITIGATION					
	M	D	S	P	TOTAL	SP	M	D	S	P	TOTAL	SP
1. Topography												
In some cases, the land will be cut and shaped in order to obtain a level area on which to position the drill rig. Depending on the location of the site, it is possible that access routes will need to be constructed and may cut into the topography to be able to transport the rig to the drilling site.	2	2	2	1	10	Low	1	2	1	1	4	Low
2. Soil												
Loss of soil resource due to drill site preparation and construction of access road.	8	2	1	5	64	High	4	2	1	5	32	Mod
Loss of soil integrity due to drill site preparation and construction of access roads.	8	2	1	3	72	Mod	4	5	1	3	36	Mod
Heavy vehicle movement, excavation exploration and soil removal will potentially result in soil compaction (lithosols soils).	4	2	1	4	28	Low	3	2	1	3	18	Low
Heavy vehicle movement, excavation exploration and soil removal will potentially result in soil compaction (clay soils).	6	2	1	4	42	Mod	4	2	1	3	24	Low
Potential spillages from heavy machinery, vehicles, generators, domestic wastewater, etc could contaminate soils.	8	2	1	3	56	Mod	4	3	1	2	24	Low
Excavation activities, vegetation clearing and soil stockpiling, could increase the potential for erosion.	4	2	1	3	24	Low	2	2	1	2	10	Low
3. Land use and land capability												
Approximately 0.3 ha will need to be cleared around the drill; this will influence the existing land use on that site. In the event that soil contamination occurs, and it is not treated and managed effectively, this could influence the capability of that land in the future.	4	2	2	4	54	Mod	4	3	2	3	32	Mod
4. Fauna and Flora												
Clearing of vegetation during the drill site preparation phase may result in	10	2	2	3	100	High	4	5	1	0	24	Low

the destruction of Red Data or Protected plant species.												
Clearing of vegetation may result in loss or fragmentation of habitat for Red Data faunal species.	10	2	2	3	100	High	4	2	2	2	24	Low
Vehicle collisions with Red Data faunal species, especially smaller, slower moving terrestrial species, on road networks.	10	2	3	2	100	High	4	2	3	1	24	Low
Impacts on fauna may result due to localized increases in noise, light and dust levels.	6	2	2	5	54	Mod	4	2	2	3	28	Low
5. Surface water												
The removal of vegetation from the site and the hardening of surfaces will result in additional erosion and runoff volumes. The increased runoff could cause local erosion and scour around the site.	2	2	2	2	12	Low	2	2	1	2	10	Low
Should access roads to the site cross watercourses, the banks of the stream and flow hydraulics could be impacted. This impact is only for cases where streams are crossed.	2	2	2	2	12	Low	2	2	2	2	12	Low
The activities on site involve the handling of fuels, domestic wastewater, and domestic waste. There is the potential for spills from these storage and material handling facilities. The runoff from the site therefore has the potential to be polluted.	2	2	2	2	12	Low	2	2	1	2	10	Low
The site could be located adjacent to a watercourse. Although the area has low rainfall, there is the potential for floods, which can in turn transfer contaminants from the site and/or impact on downstream flow paths.	4	2	2	2	24	Low	2	2	2	2	12	Low
6. Groundwater												
Leakage and spillage of fuels from vehicles / heavy machinery could impact on groundwater quality.	2	2	2	2	10	Low	2	1	1	2	8	Low
Construction of the drill site could lead to reduction in groundwater recharge.	2	1	1	4	12	Low	2	1	1	2	8	Low
7. Air quality												
Various activities during drill site preparation require disturbing the soil to some degree through the use of construction machinery. Fugitive dust will be released as drill as exhaust emissions.	8	1	1	5	56	Mod	4	1	1	5	28	Low
8. Visual aspects												
Excessive vegetation removal, dust and night lighting could result in visual Impacts.	6	2	2	4	48	Mod	4	2	2	2	24	Low

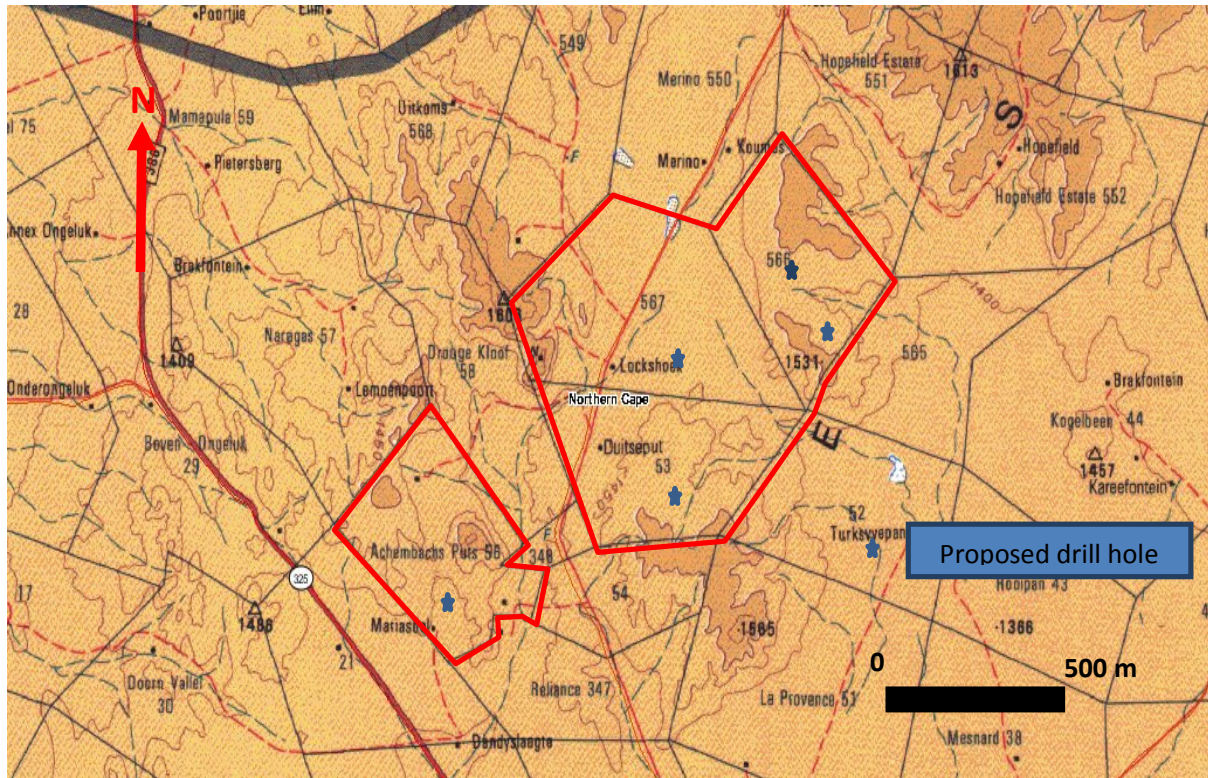
9. Noise												
Construction of access road, earth and concrete works, and trucks and heavy machinery will increase ambient noise levels.	2	2	2	4	16	Low	2	2	2	3	14	Low
10. Cultural heritage												
Construction of access roads and the drill site may damage heritage sites and features in the immediate environs of the drill site. The generation of dust could pose a threat to rock paintings in close proximity to the site.	8	5	2	3	80	High	2	5	2	1	16	Low
11. Sensitive landscapes												
There is a potential for impacts associated with site clearance on identified or unknown potentially sensitive features, such as Red Data species habitat types and paleontological sites.	6	4	3	3	60	Mod	4	3	3	1	28	Low
12. Socio-economic aspects												
Loss of land due to construction of drill site and access road.	4	2	1	4	28	Low	2	2	1	4	14	Low
Presence of foreign exploration teams may lead to social conflict due to cultural and language differences.	2	2	2	5	18	Low	2	2	1	5	16	Low
Local employment opportunities and local spending.	2	2	2	1	10	Low	2	2	1	2	10	Low
13. Access, traffic and transport												
Site preparation activities will entail additional traffic on local roads. Additional traffic will increase wear and tear on the roads, increase risk of accidents, and increase noise and fugitive dust levels.	4	2	3	4	36	Mod	4	2	2	4	32	Mod

4. REGULATION 52 (2) (d): Financial provision. The applicant is required to-

4.1. Plans for quantum calculation purposes.

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

Below is a map showing proposed drill holes.



4.2. Alignment of rehabilitation with the closure objectives.

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

The rehabilitation plan has been designed to align to the closure objectives.

The primary closure objectives are to:

- Prevent potential contamination of surface water
- Prevent the potential for water contamination groundwater aquifers
- In the event that deep water supply boreholes are used to supply water to the project, prevent a pathway for poor quality (brackish and/or saline groundwater) targeted at depth to contaminate the overlying freshwater aquifer
- Prevent permanent soil compaction
- Prevent disturbance of archaeological, heritage and cultural sites
- Prevent soil erosion
- Prevent disturbance of natural habitat for ecology
- Establish a self-sustaining vegetation cover
- Prevent the colonization of the site by invasive alien plant species

4.3. Quantum calculations.

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

CALCULATION OF THE QUANTUM

Applicant: Leago Mining and Infrastructure Investments Pty (Ltd)

Location: Midrand

Date: 09 December 2013

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	10,27	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	143,09	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	210,87	1	1	0
3	Rehabilitation of access roads	m2		25,61	1	1	0
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	248,52	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	135,56	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	286,18	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha		150016,6	1	1	0
7	Sealing of shafts adits and inclines	m3	0	76,82	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	100011,1	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	124562	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	361787	1	1	0
9	Rehabilitation of subsided areas	ha	0	83744,2	1	1	0
10	General surface rehabilitation	ha	0,1	79225,63	1	1	7922,563
11	River diversions	ha	0	79225,63	1	1	0
12	Fencing	m	20	90,37	1	1	1807,4
13	Water management	ha	0	30123,81	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0,1	10543,33	1	1	1054,333
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
						Sub Total 1	10784,296
1	Preliminary and General		1294,11552		weighting factor 2		1294,11552
						1	
2	Contingencies				1078,4296		1078,4296
						Subtotal 2	13156,84
						VAT (14%)	1841,96
						Grand Total	14999

4.4. Undertaking to provide financial provision

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

Leago Mining and Infrastructure Investments (Pty) Ltd undertakes to provide an amount of R 15 000 as a bank guarantee for rehabilitation should the prospecting right be granted.

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

5.1. List of identified impacts requiring monitoring programs.

- Loss of soil integrity
- Loss of soil resource
- Soil contamination and pollution
- Loss of vegetation
- Erosion
- Land capability and land use impact
- Impact on Ecology (Fauna and Flora)
- Polluted runoff leaving site
- Flooding of site
- Spills and leakages affecting water quality
- Air quality
- Visual aspects
- Noise
- Archaeology / cultural heritage / palaeontology aspects
- Sensitive landscapes
- Access, traffic and transportation
- Waste

5.2. Functional requirements for monitoring programs.

Drilling site selection
Soil and Vegetation Management Plan
Wild Life and Wildlife Habitat Management Plan
Water Management Plan
Hazardous Material Management Plant
Sediment and Erosion Control Plan
Non-Hazardous Solid Waste and Domestic Wastewater Management

Plan
Spill Prevention and Response Plan
Transportation Management Plan
Archaeological/Cultural Resources Management Plan
Occupational Health and Safety Plan
Noise Management Plan
Air Quality Management Plan
Decommissioning, Rehabilitation and Closure Plan
Rehabilitation Follow-Up

5.3. Roles and responsibilities for the execution of monitoring programs.

MONITORING PROGRAMME	DESIGNATION	PERSON RESPONSIBLE
Drilling site selection	Geologist and Environmental Consultant	Nkululeko Mzobe
Soil and Vegetation Management Plan	Environmental Consultant	Nkululeko Mzobe
Wild Life and Wildlife Habitat Management Plan	Environmental Consultant	Nkululeko Mzobe
Water Management Plan	Environmental Consultant	Nkululeko Mzobe
Hazardous Material Management Plant	Environmental Consultant	Nkululeko Mzobe
Non-Hazardous Solid Waste and Domestic Wastewater Management Plan	Environmental Consultant	Nkululeko Mzobe
Spill Prevention and Response Plan	Environmental Consultant	Nkululeko Mzobe
Transportation Management	Environmental Consultant	Nkululeko Mzobe

Plan		
Archaeological/Cultural Resources Management Plan	Environmental Consultant	Nkululeko Mzobe
Occupational Health and Safety Plan	Environmental Consultant	Nkululeko Mzobe
Noise Management Plan	Environmental Consultant	Nkululeko Mzobe
Air Quality Management Plan	Environmental Consultant	Nkululeko Mzobe
Incident Investigation and Reporting Plan	Environmental Consultant	Nkululeko Mzobe
Emergency Response Plan	Environmental Consultant	Nkululeko Mzobe
Decommissioning, Rehabilitation and Closure Plan	Environmental Consultant	Nkululeko Mzobe
Rehabilitation Follow-Up	Environmental Consultant	Nkululeko Mzobe

5.4. Committed time frames for monitoring and reporting.

MONITORING PROGRAMME	DUE DATE FOR COMPLETED PLAN	FREQUENCY OF MONITORING AND REPORTING
Drilling site selection	Prior to commencement of drilling	3 months before drilling
Soil and Vegetation Management Plan	Prior to commencement of site establishment	Prior, during and after drilling
Wild Life and Wildlife Habitat Management Plan	Prior to commencement of operation	Prior to site establishment
Water Management Plan	Prior to commencement of operation	Prior, during and after drilling
Hazardous Material Management Plant	Prior to commencement of operation	Prior, during and after drilling
Non-Hazardous Solid Waste and Domestic Wastewater Management Plan	Prior to commencement of operation	Prior, during and after drilling
Spill Prevention and Response Plan	Prior to commencement of operation	Prior, during and after drilling
Transportation Management Plan	Prior to commencement of operation	During drilling
Archaeological/Cultural Resources Management Plan	Prior to commencement of operation	Prior, during and after drilling
Occupational Health and	Prior to commencement of	Prior, during and after

Safety Plan	operation	drilling
Noise Management Plan	Prior to commencement of operation	During drilling
Air Quality Management Plan	Prior to commencement of operation	During drilling
Incident Investigation and Reporting Plan	Prior to commencement of operation	Not more than 48 hours after occurrence of incident
Emergency Response Plan	Prior to commencement of operation	Prior, during and after drilling
Decommissioning, Rehabilitation and Closure Plan	Prior to commencement of operation	After drilling
Rehabilitation Follow-Up	Prior to commencement of operation	After decommissioning

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

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

The rehabilitation plan entails the following aspects:

- Removal of all foreign material
- Disposal of all waste material in designated waste site
- Ripping of all hardened surfaces
- Backfill of all sumps and boreholes with soil and vegetation
- Seeding to repair all disturbed vegetation
- Repair of all damaged existing infrastructures e.g. fences
- Installation of concrete plugs on all boreholes
- Covering of concrete plugs with soil
- Erosion control and maintenance
- Monitoring and follow on all mitigation plans that have been put in place

The anticipated prospected area at the time of closure is restoring the area into agricultural quality which is the current land use.

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

The primary closure objectives are to:

- Prevent potential contamination of surface water
- Prevent the potential for water contamination groundwater aquifers
- In the event that deep water supply boreholes are used to supply water to the project, prevent a pathway for poor quality (brackish and/or saline groundwater) targeted at depth to contaminate the overlying freshwater aquifer
- Prevent permanent soil compaction
- Prevent disturbance of archaeological, heritage and cultural sites
- Prevent soil erosion
- Prevent disturbance of natural habitat for ecology

- Establish a self-sustaining vegetation cover
- Prevent the colonization of the site by invasive alien plant species

6.3. Confirmation of consultation

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

The environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

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

7.1. Identification of interested and affected parties.

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

No community was identified as the land is privately owned.

7.1.2. Specifically state whether or not the community is also the land owner.

The community is not the landowner, the land is privately owned.

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

The Department of Land Affairs has been identified as an interested and affected party.

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

There are no land claims involved.

7.1.5. Name the Traditional Authority identified.

No Traditional Authority has been identified as the land is privately owned.

7.1.6. List of landowners identified by applicant (Traditional and Title Deeds owners).

FARM NAME	PORTION	OWNER	CONTACTS
Remaining Extent of Plaas 656		Mr J.F. Jacobs	Cell: 0823766537 Email: jfj47@gmail.com
Remaining Extent of Plaas 567 (Lockshoek)		Mr C. Viljoen	Cell: 0823714737 Tel: 0533131906 Email: cfviljoen3@gmail.com

Remaining Extent of Achembach Puts 56		Mr A. Barnard	Cell: 0845815722 Email: apiebarnard@wsinet.co.za
Plaas 53 (Duitseput)	1	Mr J.P. van der Linde	Cell: 0716838985 Tel: 0533430001

7.1.7. List of Lawful occupiers of the land concerned.

There are no lawful land occupiers.

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

A mining operation may affect nearby communities positively due to job opportunities being created and economic growth.

7.1.9. Name the local municipality.

Siyancuma Local Municipality

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

Department of Land affairs

Department of Water Affairs and Forestry

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

See appendix B for the consultation records.

7.2. The details of the engagement process.

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

The interested and affected parties were provided with the DMR reference number of the application, the details of the applicant, the commodity applied for and how to register as an

interested party. The activities of the prospecting activity and their potential impacts and mitigation measures were provided.

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

Interested and Affected Party	Consultation Status
Mr A. Banard	Consulted
Mr J.F. Jacobs	Consulted
Mr C. Viljoen	Consulted
Mr J.P. van der Linde	Consulted
Siyancuma Local Municipality	Consulted
Phemelo Ohentse	Consulted
Dirleton Minerals and Energy	Consulted
Department of Land affairs	Not consulted
Department of Water Affairs and Forestry	Not Consulted

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

- Compensation
- Water usage
- Fences and gates
- Access control
- Rehabilitation

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

- All land owners raised the issue of how they will be compensated for access to their land.
- The scarcity of water in the area was raised.
- The issues of fences and gates being damaged was raised.
- Access control to ensure that there is no theft was raised.
- The owners raised concerns about rehabilitation not being undertaken properly.

7.2.5. Other concerns raised by the aforesaid parties.

There were no other issues raised.

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

All consultation records are attached in appendix A of this EMP

7.2.7. Information regarding objections received.

No objections have been received to date.

7.3. The manner in which the issues raised were addressed.

- The landowners were informed that a compensation plan will be worked with them and the company and this will be a negotiation based on their input.
- They were informed that the Department of Water Affairs and Forestry is also consulted in the decision of granting
- No fences or gates should be destroyed in case of damage, the fence or gate will be repaired to the owner's satisfaction.
- Access control will be plan together with the land owner.
- The EMP has provision for the rehabilitation and the company has to comply.

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

8.1. Employee communication process

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

Employee communication process will be done using the following methods:

- HSEC Inductions for all personnel at site
- Toolbox talks that will be held every morning before commencement of activities
- Training using videos and documentaries
- Awareness Campaigns that will be held once a month
- Pamphlets and Notice Boards on site
- Circulation of emails on important environmental topics

8.2. Description of solutions to risks

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

Risk will be dealt with by designing and implementing the following plans and training all the personnel and contractors on site on the implementation of the risk management plans:

- Training of all personnel using machinery and equipment
- Training of all personnel handling harmful chemicals
- Spill Prevention and Management Plan
- Fire Emergency Response Plan
- Waste Management Plan
- Material Handling Safety Data Sheets
- Hazardous Materials Management Plan

- Incident Reporting and Investigation Procedures
- Air Quality Management Plan
- Noise Management Plan
- Sediment and Erosion Plan
- Soil and Vegetation Management Plan

The abovementioned plans are further described in detail in Appendix A

8.3. Environmental awareness training.

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

- Training will be held for Critical Activity Requirements
- Interactive talks will be held continuously to enhance participation in environmental preservation issues
- Training and drills on the emergency response plans will be held
- Personnel will be required to know the company's environmental policy
- Individual will be chosen and trained to be champions of the management and remediation plans that are put in place

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

9.1. The annual amount required to manage and rehabilitate the environment.

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

The annual amount required for rehabilitation is R 1054.33. This was derived from the quantum calculation table for the maintain ace and aftercare.

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

The Directors of Leago Mining and Infrastructure Investments (Pty) Ltd would like state that this amount has been stated in the Prospecting Work Programme

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	MATHAPELO RATANANG GAOFENNGWE MALAO
Identity Number	██████████

-END-

APPENDIX A

TECHNICAL, MANAGEMENT AND MONITORING PLANS

A. Site Selection Criteria

ENVIRONMENTAL ASPECT	PRELIMINARY CRITERION	ISSUE ADDRESSED
Agriculture	Site no to be situated on high potential arable land	Economic loss
Infrastructure (boreholes)	Site not to be within 100 m or the drawdown area of any borehole.	Groundwater pollution
Slope	Site not to exceed an average slope of 10%.	Erosion hazard
Geology	Site not to be closer than 500 m to the nearest major dyke present at surface.	Groundwater pollution
Dams and Rivers	Site not to be closer than 500 m from the nearest dam or perennial river. Site not to be within the 100 year flood line or within a 100 m of the watercourse (whichever is greater). Access roads preferably not to cross watercourses.	Surface water pollution / biodiversity
Wetlands	Site not to be closer than 100 m from areas of hydromorphic soils (wetlands).	Surface water pollution / biodiversity
Protected areas	Site not to be closer than 500 m from the boundary of any proclaimed conservation area, critical biodiversity areas as well as protected areas contemplated in terms of the National Environmental Management: Protected Areas Act of 2003.	Biodiversity
Threatened habitat	Site not to be within any area untransformed area of endangered habitat. Site not to be within any area with high densities of Red Data or Protected Plant species.	Biodiversity
Visual	Site not to be located where light at night can interfere with areas protected by the Astronomy Geographic Advantage Act (AGA).	Risk to astronomy projects
Heritage	Site not to be placed within 100 m of declared national and provincial heritage sites.	Heritage
Landowner agreements	Site; preferably to be where landowner/s have consented and entered into an agreement for land access.	Good relations
Homesteads	Site not located in close proximity to homesteads – distance to be confirmed by noise specialist studies, etc.	Nuisance, risk
Overlaps with other issued rights (mining)	Site not located in area where existing mining related rights have been issued, or are under consideration.	Conflict with other issued rights (mining related)
Astronomy	Site not to be located in areas where exploration activities will be in violation of any restrictions or prohibitions in terms of the Astronomy Geographic Advantage Act (AGA).	Risk to astronomy projects
Infrastructure (airfield)	Site not to be closer than 500 m to any airfield.	Use conflict

B. Soils and Vegetation Management Plan

Soils and vegetation effects are expected to be greatest during drilling site preparation when soil is removed and terrain and vegetation disturbed during site clearing for the project.

Site Preparation Phase

Soil

Topsoil materials will be salvaged before site clearing. The topsoil salvaged will be stockpiled and used as reclamation material during decommissioning. Topsoil stockpiles will be strategically located to avoid operational disturbance. As well, erosion control measures (including vegetating) will be applied to the salvage stockpiles to reduce erosion.

Vegetation

Vegetation will be removed during the clearing process. Vegetation removal will occur only as necessary for the placement of drill pads, structures and access roads. Small trees and shrubs may be mulched and incorporated into and placed onto the topsoil piles to improve the organic matter and reduce erosion.

Burning of vegetation will be limited when practical. All environmental monitors will have an illustrated list of rare plants that might be found in the areas to be cleared. Rare plants will be identified by the environmental monitors and salvaged, where practical, and re-established in suitable natural habitats unaffected by the project construction.

Invasive Plants

An environmental monitor will conduct annual surveys for invasive plants along access roads and around the drilling site. If found they will be removed by hand, bagged and burned.

C. Sediment and Erosion Control Plan

A Sediment and Erosion Control Plan (SECP) will be developed during detailed design phase of the Project. This plan deals with the management of sediments arising from the erosion of overburden fines in areas disturbed as part of the construction and operations activities. Erosion and sediment management will involve the use of a number of management practices that will target each of the erosion process stages. Upstream and non-contact diversion systems will help to keep clean water from running onto disturbed areas, thus reducing volumes for handling and the erosive power of the water that would otherwise need to be handled within the disturbed areas of the site. This will minimize the volumes potentially requiring sediment control and/or treatment as well as the overall footprint of areas required for treatment facilities.

D. Hazardous Materials Management Plan

A Hazardous Materials Management Plan (HMMP) will be developed for the project that will identify potentially hazardous materials to be used at the site and provide a system for monitoring these materials. Transportation, storage, use and ultimate disposal will be considered. Safety of the workers and the surrounding communities will be taken into account for all stages of materials handling during all project phases. This section presents a framework for a HMMP. This EMP must be informed by the outcome of site-specific detailed environmental assessments.

Training

Hazardous materials and wastes require special handling and training procedures. All employees will be provided with basic training so that, at minimum, they:

- Can identify hazardous materials
- Know how to obtain appropriate information on special handling procedures required
- Know what precautions and protective equipment are required
- Know how to label and package hazardous materials and wastes
- Know where and how hazardous wastes are to be stored
- Know how wastes are to be disposed

Employees who are tasked with receiving, off-loading and storing potentially hazardous materials or involved in the storage and shipment off-site of hazardous wastes should receive hazardous materials handling training.

Hazardous Waste Identification

Project designs and processes will be reviewed to identify waste streams. A system will be developed to screen and classify waste streams according to applicable legislation.

Transport

Proper labeling, marking and placarding using proper containers will be implemented for all hazardous materials being transported.

The following measures will be implemented during transport:

- Non-compatible materials will be transported by separate shipment
- Fire extinguisher and fire prevention materials will be adequate and appropriate for the material being transported
- Containers will be appropriate for the material being shipped
- Containers will be properly secured
- Containers and trucks will be properly marked, labelled and placarded
- Transport manifests will be maintained
- Spill response materials will be adequate and appropriate for materials being transported
- Drivers will be adequately trained and equipped for spill first response, containment and communication.

Hazardous Materials Storage

Hazardous materials will be segregated and stored using accepted management practices including but not limited to the following:

- The storage areas will be designed to adequately and safely store a sufficient quantity over a prescribed period
- The storage area will be properly designed to contain and prevent contamination of the environment, particularly soil and groundwater
- Floor, curbing, walls and roofs will be designed to adequately contain spills and to protect the storage area from weather where necessary

- Spill kits, protective equipment, and other necessary equipment to clean and mitigate spills will be in the storage area or near the storage area
- Fire prevention systems appropriate and adequate for the materials being stored will be designed
- Only containers that are in good condition will be used
- Containers or liner materials will be compatible with the waste being stored
- Incompatible (e.g., bases and acids) materials will not be stored in the same container and will be stored safely and sufficiently far apart to prevent accidents
- To provide a safe work area, incompatible wastes will be separated by walls, dykes, or stored in separate facilities
- Drums, containers, and storage areas will be properly labelled, marked, placarded and secured;
- Sufficient storage space between containers will be allowed for safe access and handling of containers
- A no smoking policy will be implemented and fire prevention and management practices will be developed specific to the materials being stored.

Waste Minimization

The following procedures will be used to minimize wastes before start-up and as an ongoing programme during operation:

- Using whenever possible, non-hazardous materials in lieu of hazardous materials
- Keeping inventories of products to a workable minimum to prevent expiration of dated products (shelf life) and the generation of wastes
- Developing alternative methods or processes to reduce generation of high volume wastes
- Properly segregating and handling waste streams to minimize cross contamination of hazardous and non-hazardous wastes
- Developing, implementing and tracking training programs and housekeeping standards to reduce wastes;
- Making waste minimization procedures a part of employee training programs

Inspection Programme

An inspection programme will be developed with the following objectives:

- To inspect the project area for proper waste segregation, storage, and disposal
- To inspect waste storage sites and document the volume of waste stored, type of waste, and storage facility conditions

- To inspect spill kits and protective equipment, and reorder and replace as necessary
- To allow periodic reviews of off-site transporters including procedures, training, equipment, spill kits, records, and employee awareness
- To review inspection findings with operation, transporters, and off site contractors to correct deficiencies
- Maintain awareness and communication, and to recognize negative or positive performance; and Inspection programme

E. Non-Hazardous Solid Waste and Domestic Wastewater Management

Plan

This plan discusses the recycling, storage, handling, and disposal of all non-hazardous industrial and domestic wastes including sewage.

List of Typical Wastes

Typical wastes that will be generated from construction and operations are listed below:

Domestic Wastes

- Food waste
- Biological waste from first aid operations
- Paper and cardboard
- Plastics
- General waste such as plastic food wrap during construction
- Office wastes such as used office supplies

Inert Bulk Waste

- Non-toxic, non-food solid wastes will be sorted into four types: combustible, non-combustible, recyclable, and reusable in the waste transfer storage area
- Combustible items will be disposed in an off-site approved incinerator (if required by applicable regulations and suitable for disposal), while non-combustible items will be land filled or recycled if practical
- Inert bulk wastes that cannot readily be recycled or reused, such as general debris, will be stored in the waste transfer storage area and transferred to the landfill

Solid Waste Management Facilities

Good housekeeping dictates the management of solid wastes. Solid waste management will be coordinated through the company and its contractors. Key elements in the management of inert industrial and domestic wastes will include:

- A solid waste management plan that will be finalized before construction begins; and
- Facilities to effectively contain and treat solid wastes, such as covered sheds for sorting and temporary storage of items that can be recycled;
- Containers for temporarily holding small solid wastes
- A waste containment area

Containers

Drums, bins, receptacles, and dumpsters used for storage of waste will be selected based on waste material requirements. All containers will be labeled to identify those wastes for which they are suitable.

Sorting

Waste must be sorted at source before it can be disposed, or transported to specific designated areas for proper disposal. The following measures will be implemented for sorting:

- Containers will be located throughout project site for immediate sorting of solid waste
- Containers will be located for the collection of burnable and non-burnable materials and recyclable wastes
- Haulers will be required to have appropriate training that prevents inadvertent release of wastes or recyclables en route; and
- Procedures and general education during employee orientation will be in place to ensure dumping of wastes in unauthorised locations or facilities does not occur.

Waste Transfer Storage Area

A secured area will be established for the handling and transfer of wastes. Non-food waste products will also be collected, sorted, and placed in designated areas within the fenced area. Once a practical quantity of solid waste has accumulated, the waste will be collected, packaged, transported and disposed of at a permitted landfill or other approved and licensed facility.

F. Spill Prevention and Response Plan

Before construction of the project commences, a Spill Prevention and Response Plan will be developed for use by field personnel in the event of a deleterious material spill. The following sections outline the general framework for this plan.

Spill Prevention and Response Priorities

All spills occurring on the project site will be responded to in a way which will uphold the following priorities:

- Protection of human life
- Protection of human health
- Protection of the environment
- Protection of property;
- Minimized disruption to operational activities

At all times, applicable regulations will be used to guide response and cleanup activities.

Spill Prevention

Site Planning

At locations where the potential for spillage of hazardous material is highest, spill control and containment means will be incorporated into the infrastructure.

Material Storage

All materials will be stored in a safe and appropriate manner which will mitigate accidental releases to the environment. Management practices to be considered for use onsite, including, but not limited to, the following:

- Double-walled containment tanks, with barriers to protect tank from accidental impact
- Bermed storage areas for material containers, with adequate capacity
- Spill response kits readily available, specific to type of material
- Regular inspections of all storage areas and storage tanks

Material Handling

Material handling procedures will be documented within this plan, and will likely include, but will not be limited to:

- Fuelling procedures; and
- Fuel truck transfer procedures

Spill Response

The objective of the spill response measures will be to ensure that where accidental spills occur, all available resources are used appropriately to minimize the extent and severity of effect on the environment. The following measures will be implemented:

Equipment

Spill response kits appropriate to the type and volume of material will be specified for each piece of equipment which handles or transports contaminant materials (including fuel). As well, spill response kits will be located at appropriate material handling and storage locations.

Spill response kit contents will be based on the potential risk associated with the material, volume of material, and environmental sensitivity of the area. General kit contents could include:

- Oil absorbent pads
- Absorbent socks
- Granular absorbent
- Protective equipment (e.g., gloves, goggles, protective suits)

All kits will be stored in a visible location, in an appropriate weather-resistant container. Regular inspections of the kits will be performed to ensure that kits are complete and all materials remain functional.

General Spill Action Plan

The following actions will be taken in the event of a spill:

- Identification and control of immediate dangers to human life or health
- Identification and control of spill source
- Elimination of additional potential spill sources
- Containment of spill
- Notification of authorities, as appropriate
- Recovery and cleanup
- Incident investigation and report

The following framework will be incorporated into the Spill Response Plan.

1) Initial Response

- Ensure safety of all personnel and public
- Mitigate hazards
- Notification
- Identify source of spill and attempt to stop and/or contain it, if safe to do so

2) Secondary Response

- Determine if additional resources are necessary (external contractors)
- Contain the spill, and protect any nearby water bodies
- Review material characteristics, and implement a suitable clean-up

3) Reporting

4) Spill Cleanup and Disposal

5) Follow-up Investigation

Training

All employees and contractors will undergo environmental hazard awareness training as part of their orientation to the site. This training programme will focus on spill prevention and hazard identification, as well as spill response and containment procedures. At minimum, employees will be educated on:

- Spill response plan
- Applicable legislation
- Environmental receptors (i.e., soil, groundwater and surface water)
- Field application of appropriate spill response techniques
- Initial response procedures
- Spill reporting procedures

G. Transportation Management Plan

Key issues to incorporate for the transportation activities during the operation of the project:

- Trucking volumes
- Trucks with hazardous materials
- Bridge loading capacities
- Special measures in localities and other sensitive points (schools for example)
- Any restricted use of road access during special dates (community celebrations for example)

Transportation for the project will include personnel, materials, and supplies to the project site and wastes from the site. The purpose of the Transportation Management Plan (TMP) is to provide a framework of management practices to be followed during the project.

The following additional management plans will also apply to the TMP:

- Occupational Health and Safety Plan
- Archaeological Resources Management Plan
- Emergency Response Plan and Spill Prevention and Response Plan
- Sediment and Erosion Control Plan
- Hazardous Materials Management
- Soils and Vegetation Management Plan

- Wildlife and Wildlife Habitat Management Plan

Road and Wildlife

The protection of wildlife is important through all phases of the project. The following management practices will be followed to control potential wildlife injury or mortality during road use:

- Speed levels will be controlled to reduce dust levels and to reduce the chance of a collision with birds and other wildlife
- Areas known to be high use areas along the road will be clearly signed
- Sensory disturbances, such as noise, will be minimized
- Harassment of wildlife will not be tolerated on site or along the access road
- Animals will have the right-of-way and areas of high use will be identified
- The road will be maintained so as to prevent potential attraction to wildlife
- No employee or contractor employee will be permitted to have firearms on site
- No employee or contractor will be permitted to fish while on company business or during travel to and from the project site.

Archaeological and Cultural Heritage Resources Sites

As noted in the Archaeology/Cultural Resources Management Plan, a Chance Find Procedure (CFP) will be implemented during the construction and operation phases of the Project. If archaeological artifacts or features are encountered during any road construction and other project activities, the company and its contractors will initiate the CFP.

Guidelines for Vehicular Traffic

The following guidelines will apply to vehicular traffic:

- All drivers will be properly licensed and trained according to specific vehicle type and operating conditions
- Vehicle use will be determined by local ground conditions and access requirements
- All local traffic laws and speed limits will be obeyed
- Traffic on the rights-of-way will follow the posted speed limits, which might vary depending on site-specific conditions

- All vehicular traffic will be confined to approved rights-of-way, workspace and access roads or trails; and
- Site-specific features of concern (e.g., archaeological sites, sensitive wildlife habitat) will be flagged, otherwise designated, so that subsequent traffic can avoid these areas

H. Archaeological/Cultural Resources Management Plan

The purpose of the Archaeological/Cultural Resources Management Plan (ACRMP) is to:

- Manage and protect existing archaeological and cultural heritage resources during construction and operations
- Provide a framework to identify, manage, protect, or mitigate recorded and previously unrecorded archaeological and cultural heritage resources encountered during project construction and operation.

General components of this plan include the following.

Protection of Existing Sites

Existing sites will be protected using the following procedures:

- Once the preliminary sites are selected, a site specific cultural heritage impact assessment will need to be conducted to identify any heritage sites and features. Based on the findings of the assessment:
- No access roads should be constructed within 20 m of identified heritage sites and features which are rated as sites of high *local* significance by the South African Heritage Resource Agency(SAHRA)
- No drill sites should be constructed within 50 m of heritage sites and features which are rated as sites of high *local* significance by the SAHRA

- No well sites or access roads should be constructed within 100 m of rock art sites which are rated as sites of high *local* significance by the SAHRA
- All project plans/drawings will be reviewed to ensure that all construction areas have been examined for archaeological and cultural resources
- All project plans/drawings will be reviewed on an on-going basis to ensure that all areas affected by undergo archaeological study as necessary
- All project plans/drawings will be marked to identify any archaeological and cultural resources that require protection or monitoring;
- Protective measures will be taken throughout the project area to avoid and mitigate effects on identified archaeological resources and culturally sensitive areas

Archaeological and Cultural Heritage Resources Awareness Training

An internal awareness education and training programme will be conducted to provide personnel and contractors with knowledge and an understanding of the importance of archaeological and cultural resources.

Monitoring

A monitor will be responsible for ensuring that the designated archaeological resources areas are avoided, protected, and monitored.

Monitoring procedures to be followed during the life of the project will include the following:

- All areas (identified archaeological sites, possible archaeological sites, and areas of cultural sensitivity) requiring archaeological monitoring or protection throughout the project site will be clearly marked on the development plans;
- Any identification, recording, removal, and reporting of artefacts or features will be conducted under the supervision of a qualified archaeologist; and
- The exposure and identification of previously unidentified archaeological resources will automatically result in the implementation of the chance find procedures described below.

Any archaeological investigations of known sites or chance find sites discovered during construction will be done by a qualified archaeologist.

Chance Find Procedure

The chance find procedure (CFP) outline the protocol to be followed if a new archaeological or cultural resource is encountered in any phase of the project. The CFP is primarily applicable to:

- Construction and operations personnel and management
- Contractors
- Environmental team
- Visitors or other people active in the project area

The proposed CFP measures are as follows:

When a suspected archaeological or cultural resource find has been encountered, he/she will immediately make efforts to protect the site by excluding traffic and further disturbance. If an artifact has been discovered, it will not be removed from the site. All work near the site or artifact will stop immediately and construction equipment will be kept away from the site or artifact to avoid further disturbance or destruction. A qualified archaeologist and the applicable government ministry will immediately be contacted. An archaeological or cultural heritage resources site card will be completed by a qualified archaeologist with the following basic information:

- Date (when the archaeological find was first encountered)
- Observer (name of the person recording the information on the site or artefact)
- Site location (detailed enough so that it can be relocated, GPS if possible)
- Type of site (archaeological site, burial site or artefact)
- Any obvious disturbance to the site (by equipment, animals, etc.)
- Photographs

The qualified archaeologist will assess the significance of the artifact and the location. Mitigation options for the site or artifact will be drafted by the archaeologist, reviewed and approved by the applicable government ministry, and an agreement on the approach will be determined by the qualified archaeologist in coordination with the government ministry. Once the site is assessed and mitigated to the satisfaction of government ministry and the site has been cleared, construction or operations activities may recommence.

I. Occupational Health and Safety Plan

An Occupational Health and Safety Plan (OHSP) will be prepared prior to construction and operation of the Project. The OHSP will uphold the company's commitment to a safe environment for employees,

contractors and visitors. The plan will also address all applicable legal requirements relating to health and safety. The OHSP will set out the framework under which health and safety on the project site and to and from the site will be managed. The roles and responsibilities of the company, manager, superintendents, supervisors and workers are set out under this plan. The programs that will be outlined under the plan include provisions for the anticipation, recognition, evaluation and control of physical, chemical, radiological, biological, ergonomic and psychosocial factors that may exist at the project site and in other project related activities. A health and safety training programme will also be implemented at the site. The objectives of this training programme will be to:

- Provide appropriate orientation and support to all employees, contractors and visitors onsite so that they can act in an appropriately safe manner
- Provide ongoing training to workers
- Inform at risk workers to help attain a positive and safe work environment
- Instruct managers and supervisors of duties and responsibilities, including applicable legislation, risk communication, labour relations and hazard prevention; and
- Instruct workers of responsibilities and rights

J. Decommissioning, Rehabilitation and Closure Plan

Drill sites will only be decommissioned if no resources are found or deemed technically / commercially not viable. If the drill site is decommissioned, then the drill hole will be sealed off below the level of the upper aquifer and capped.

The primary closure objectives are to:

- Prevent the contamination groundwater aquifers;
- In the event that deep water supply boreholes (sufficiently deep to access brackish-to-saline water supplies) are used to supply water to the project, prevent a pathway for poor quality (brackish and/or saline groundwater) targeted at depth to contaminate the overlying freshwater aquifer;
- Establish a self-sustaining vegetation cover; and
- Prevent the colonisation of the site by invasive alien plant species.

The above will be achieved by implementing the following rehabilitation plan:

- Adequately seal the drilling well below the level of the upper aquifer and cap the well

- Adequately seal water supply boreholes. Ensure correct application of pressure grouting techniques, including maintaining records of the volume of cement used compared to volume of the well
- Remove all temporary works in and around the accommodation camp and drilling site
- Fences and private roads disturbed by activities will be restored to their original condition unless another agreement is reached with the applicable landowner
- Allow normal surface drainage except where special measures are employed to prevent soil erosion
- Loosen compacted soils along the delineation of the access road. Scarifying areas where topsoil has been removed shall be carried out prior to the replacement of topsoil. Care shall be taken to avoid topsoil inversion if scarifying is carried out in areas where topsoil has not been removed
- Where the land is naturally armoured with surface rock or stone, armouring rock should be placed over the construction servitude to protect against erosion, in a manner similar to its original condition
- Where the access road routes/affected areas pass through areas that are disturbed or degraded to varying degrees, especially where extensive agriculture has occurred, indigenous vegetation should be established, covering the affected areas, in order to protect the soil against erosion.
- Implement an invasive plant monitoring programme at the site, until such a time as the indigenous vegetation community has been re-established.

K. Air Quality Management Plan

The Air Quality Management Plan (AQMP) addresses the management of emissions and air quality associated with construction and operation activities. This plan covers all activities that could result in air emissions through all phases of the project.

This EMP must be informed by the outcome of site-specific detailed environmental assessments. Therefore, the outcome of the scoping and EIA process in terms of the NEMA and the information and reports generated during that application process will be essential to the refining of this plan.

The principles used to develop the AQMP include:

- Meeting all applicable regulatory standards regarding air emissions
- Implementing best management practices in air emissions management
- Consulting with local communities to understand community air quality issues related to the project
- Having a programme in place to monitor and verify performance standards

The AQMP goal is to manage air emissions from the project so that the effect on air quality is minimal.

The AQMP targets are:

- Keep all air emissions within appropriate regulatory guidelines
- Keep ambient air quality within appropriate regulatory guidelines and standards
- No regulatory or community concerns regarding air quality and emissions management
- The following main emission sources are anticipated during the Project:
 - Vehicles, specially traffic on un paved roads
 - Construction equipment
 - Fugitive emissions

The following general management practices and measures by project phase, include, but are not limited to:

Design Stage

- Selecting equipment with low emissions that meet SA legislated emissions standards and guidelines
- Designing covers or control devices to limit the spread of dust.

Site Preparation Phase

- Using low sulphur and low aromatic fuel
- Using modern construction/ equipment that meets latest applicable emissions standards
- Ensuring proper equipment maintenance
- Limiting vehicle and construction equipment idling
- Minimising land disturbance
- Optimising vehicle movement
- Using dust suppression measures

Drilling Phase

- Using low sulphur and low aromatic diesel fuel
- Limiting vehicle idling
- Optimising vehicle movement

- Using dust suppression measures (i.e., wetting work areas, roads, and storage piles, installing equipment covers, and using dust hoods and shields)

M. Noise Management Plan

A Noise Management Plan (NMP) will be prepared for the Project before construction commences.

Elements of the NMP will include, but not be limited to:

- Identification of applicable ambient noise criteria
- Implementation of noise mitigation measures as presented in the following sections
- Development and implementation of noise monitoring plan to verify compliance with relevant standards and criteria
- Employee training awareness.

Site Preparation and Drilling

Mitigation measures that can be implemented during these phases include:

- Schedule noisy construction activities at normal working hours (i.e., day-time) as much as possible
- Perform regular inspection and maintenance of construction vehicles and equipment to ensure that they have good quality mufflers installed and worn parts are replaced
- Turn equipment off when not in use
- Use noise abatement accessories such as sound hood and mufflers. If required, use noise barriers, baffles or enclosures for particularly noisy equipment, where feasible
- Develop and implement a noise monitoring programme for the construction phase

Noise Associated with Road Traffic

The following measures that will be implemented to minimize transportation-related noise impacts include, but are not limited to:

- Avoid trucking operations at night, where possible.
- During maintenance check that noise abatement devices are in good order (e.g., brakes, exhaust mufflers).
- Place speed limits along access roads that are located off primary roads and highways

APPENDIX B

RECORD OF CONSULTATION

