



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

TEL NO: 0823129181

FAX NO: tokkas@impondo.com

POSTAL ADDRESS: P O BOX 7043, STELLENBOSH, WESTERN CAPE, 7600

PHYSICAL ADDRESS: 2 Compactor Street, Paradyskloof, Western Cape, 7600

FILE REFERENCE NUMBER SAMRAD: NC 30/5/1/1/2/12147 PR

FILE REFERENCE NUMBER SAMRAD: NC 30/5/1/1/2/12147 PR

1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process—

- (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- (c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- (d) determine the—
 - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
 - (ii) degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources, and
 - (cc) can be avoided, managed or mitigated;
- (e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- (f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- (g) identify suitable measures to manage, avoid or mitigate identified impacts; and
- (h) identify residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of The Practitioner: M A Golaith

Tel No.: 0824523693

Fax No. : goliathmalcolm@yahoo.com

e-mail address: goliathmalcolm@yahoo.com

ii) Expertise of the EAP.

(1) **The qualifications of the EAP**

(with evidence).

MMC/NHD/LSTD

(2) **Summary of the EAP's past experience.**

(In carrying out the Environmental Impact Assessment Procedure)

Occupation :Consulting Mine Engineer

Age :51

Gender :Male

Nationality :South African

Language :English, Afrikaans

Current Employer : BNL NNAKE ENTERPRISES (PTY) LTD

CONSULTANT-2007-PRESENT

Areas of Consultation

- Mine Development and Mine Exploration
- Mine Health and Safety Inspections
- Develop MWP and PWP's
- Develop Environmental Management Plan/Programme
- Develop and Assess Social and Labour Plan
- Consultation with Interested and Affected Parties Report
- Section 11 and 102 Application
- Closure application
- Annual Reporting-Performance Assessment Report

MAJOR PROJECTS

Mining Right Applications- Tsweleng Mining, Bucklands Community Development Trust,
Kimberley West Diamond Mine and Hotazell

Mining Permit Applications (5)

Prospecting Right Applications (10)

1999 – 2006

Managing Director-Sedibeng Mining (PTY) LTD

Mine Manger

Responsibilities

- Manage all Mining disciplines
 - Ensure Compliance to Mine Health and Safety Act, EMPr, Social and Labour Plan, Mine Work Program
 - Financial and Technical Plan Development and Monitoring
 - Section 11 and 102 Application
 - Closure application
 - Annual Reporting-Performance Assessment Report
-

1993-1998

Regional Co-ordinator Minerals and Policy Centre.

Responsibilities

- Responsible for the function of the Kimberley Multi-Stakeholder Forum/Member of Regional Environment and Culture Sub-Committee
 - Consultant to the Small-Scale Miners Northern Cape- compile DME mining application
 - Provide technical and geological information on mining
 - Advise on Environmental, Geological, Mining, Health and Safety, Plant and other mining disciplines.
 - Status Report on the DMR documents
 - Compiling Prospecting Work Programme
 - Site visit for inspection to the small-scale mining operations
 - Field mapping
 - Report writing and give recommendation
-

1992-

1990 Assistant Inspector of Mines-DME Northern Cape

Responsibilities

- Mine Health, Safety and Environmental Inspections on Mines in the Northern Cape
-

Pre-1998

De Beers Consolidated Mines-Finsch Mine

Mining Shiftboss/Secondary Teacher Biology and Science

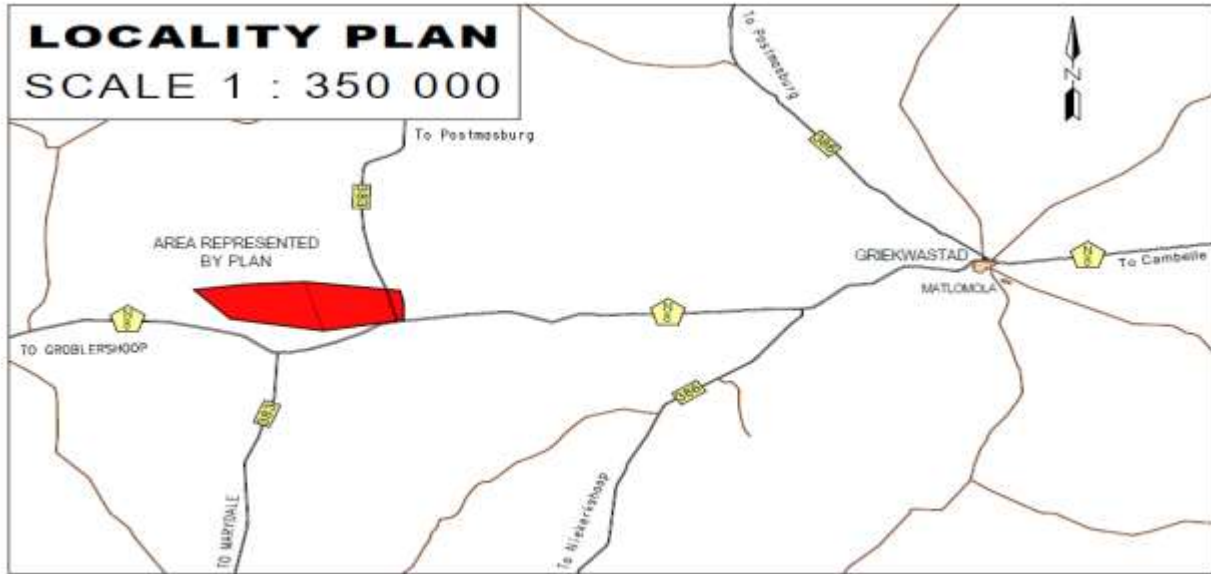
b) Description of the property.

Farm Name:	<ul style="list-style-type: none"> • Farm Name and Number: Nek 106 Measuring 2589.4461 ha • Portion 1 Cairntoul 189 Measuring 1071.0447 ha • Remainder /Extent Cairntoul 189 Measuring 1960.1750 ha Total:5620.6658 ha
Application area (Ha)	5620.6658 ha
Magisterial district:	Hay
Distance and direction from nearest town	50 Kilometres West of Griekwastad
21 digit Surveyor General Code for each farm portion	Nek 106 C031000000000106000000 Portion 1 Cairntoul 189 C031000000000189000000 (Remainder /Extent Cairntoul 189 C031000000000189000000 Different Parcel Number on SAMRAD than Portion 1 Cairntoul 189)
Locality map	Included Below
Description of the overall activity. (Indicate Mining Right, Mining Permit, Prospecting right, Bulk Sampling, Production Right, Exploration Right, Reconnaissance permit, Technical co-operation permit, Additional listed activity)	<p>Prospecting Right Reverse Circulation (RC) Drilling - Down-the-hole 6 inch to 10 inch hammer drill will be employed. A minimum of 6 and maximum of 16 holes will be drilled at a maximum depth of 12m. The total number of holes will depend on the outcome of the initial holes drilled. This would determine the pattern for future drilling. RC chips will be logged and then split and quartered so that one half of the mineral can be stored for future analyses and investigation. Composite samples will be compiled on completion of the sampling and taken to an accredited laboratory for electron microprobe analysis and mineral identification.</p> <p>.</p> <p>The Bulk sampling programme can be described two fold:</p> <ul style="list-style-type: none"> • Treatment of Historically Mined Dumps <p>The prospecting area has dump sources that was previously mined. The quantity and quality is not known but show indications of low to medium grade. 25-36% Manganese and a high silica and iron content is expected. These dump can be treated through a jigging to increase the grade to a sellable product.</p> <ul style="list-style-type: none"> • Virgin Pitting <p>This would be achieved through the use of machinery (TMM's) and a Jigging plant. Excavators are used to remove the overburden where it occur and stored in a dedicated area for final use in the rehabilitation programme. The manganese production material are then excavated through a pitting process. The planned dimensions of the excavations are 50m X30m at planned intervals of 80 m in a checkered pattern on the targetted areas. The deviation to this prospecting program could be when a particular line of interest is encountered and the prospecting be done along a channel. The ore is then transported to the plant by means of Dump Trucks. The alluvial ore is introduced to the Jig Plant Receiving Bin by means of a Load Haul Dumper. The oversize material (waste+100mm) is used as backfill in the opened-up excavation areas. The overburden is placed on site where it is later backfilled into the pit, i.e. formations will be placed back in the same sequence it was extracted. The topsoil is then introduced to complete the rehabilitation process. Rehabilitation is thus continous.</p> <p>It is extremely difficult to determine the amount, pattern and size of the pits at this stage due to the inconsistency of the manganese distribution and formation. The pits would be guided more accurately on completion of the exploration drilling program.</p> <p>The ore is treated in a jig processing plant that consists of crushing and screening. The sizing would be -10mm; +10mm -40mm and the lumpy material +40-80mm. The prospecting program is based on a rejection of -28%</p>

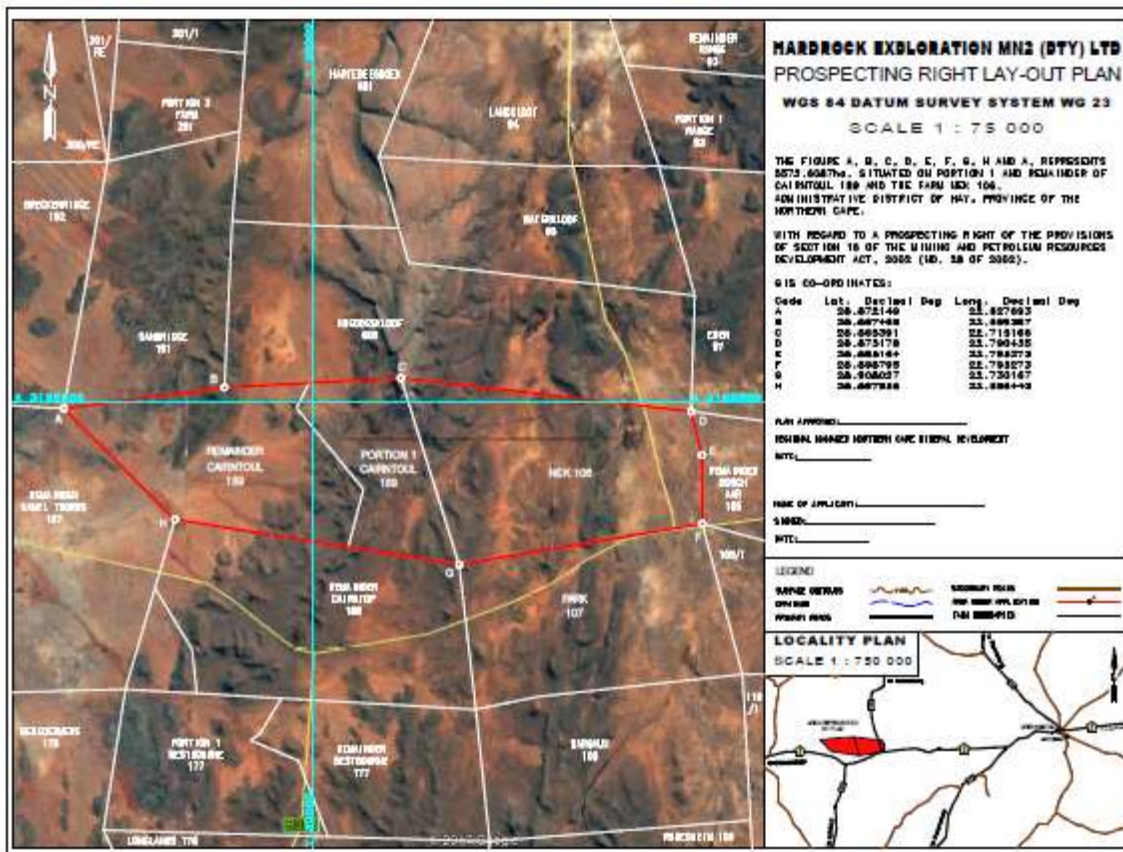
manganese content at the current market requirement that could vary in future.

c) Locality map

(show nearest town, scale not smaller than 1:250000).



APPLICATION MAP 2.2.



d) Description of the scope of the proposed overall activity.

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site

Final Lay-out will be provided with Final EIA Report and EMPr

Plant Site 800m², Workshop 300m², Stockpiles 1500m², Topsoil Storage 500m², Ablution Facilities 25m², Chemical Storage 25m², Diesel Storage 32m², Site Office 25m², Domestic Waste Facility 16m², Roads 400m², Waste Dumps 1000m²: Total Footprint 4623m².

(i) Listed and specified activities

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Development Act, 2002 (Act No.28 of 2002), including- (a) associated infrastructure, structures and earthworks directly related to the extraction of a mineral resource: or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing: but exclude the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies (Activity 20 of Listing Notice 1	5620.6658 ha lodged for the surveyed portion only.	X	GNR 327 LN 1, Activity 20
The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including- (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource: or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing: but exclude the secondary processing of a mineral resource, including the smelting, beneficiation, reduction,	5620.6658 ha lodged for the surveyed portion only.	X	GNR 325 Listed 2,Activity 19

refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies (Activity 19 of Listing Notice 2)			
Activity 27 of GNR 983 The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	1.0913 ha	X	GNR 327 LN 1 Activity 27
NOT LISTED (FOOTPRINT)			
Plant Site	800m ²		
Workshop	300m ²		
Stockpiles	1500m ²		
Topsoil	500m ²		
Ablution Facilities	25m ²		
Chemical Storage	25m ²		
Diesel Storage	32m ²		
Site Office	25m ²		
Domestic Waste Facility	16m ²		
Mine Roads and Access Roads	400m ²		
Waste Dumps	1000m ²		
Roads (Estimate)	400m ²		

(i) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, including the type of commodity to be mined and for a linear activity, a description of the route of the activity)

**Prospecting will be carried out in the following manners:
Mineral: Manganese**

Methodology and Technology

DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES:

(These activities do not disturb the land where prospecting will take place e.g. aerial photography, desktop studies, aeromagnetic surveys, etc)

Phase 1

Geological Investigation (months 1-2)

The geological investigation comprises of collecting various geological literature relating to the area of interest. This literature may be obtained from relevant books and journals and also companies that mined on the area previously. A great source of information will be Lime-Chem (PTY) LTD who currently holds a mining right over the study area. Satellite images is another source to identify possible target prospecting areas.

Geological Mapping (months 3-4)

Thorough field mapping of the surface geology will be done in order to narrow down the area to target for the determining the location of the ore body. Field mapping and satellite images assist to eliminate certain areas and focus on the possible ore deposits.

Sample Analysis (month 5)

Analysis of borehole samples is done at a competent laboratory to determine the concentration of manganese present in the ore enabling us to later determine the ore grade.

Geological modelling and geological report (months 44-60)

This written report comprises of all prospecting results as well as recommendations for future activities. This will determine the viability of applying for a mining right.

DESCRIPTION OF PLANNED INVASIVE ACTIVITIES:

(These activities result in land disturbances e.g. sampling, drilling, bulk sampling, etc)

Phase 2-Exploration Drilling Program (months 2-4)

Reverse Circulation (RC) Drilling - Down-the-hole 6 inch to 10 inch hammer drill will be employed. A minimum of 6 and maximum of 16 holes will be drilled at a maximum depth of 12m. The total number of holes will depend on the outcome of the initial holes drilled. This would determine the pattern for future drilling. RC chips will be logged and then split and quartered so that one half of the mineral can be stored for future analyses and investigation.

Composite samples will be compiled on completion of the sampling and taken to an accredited laboratory for electron microprobe analysis and mineral identification.

The following duties will be the responsibility of the person appointed on site.

Planning of borehole positions

- Siting of boreholes in field
- Detailed infill mapping
- Monitor of boreholes in progress
- Logging of each borehole
- Transport borehole samples to laboratory
- Capture all borehole data in electronic format
- Compiling of borehole profiles

The expected time frame for the drilling exercise is between 30-40 working days. This does not include the time for site establishment and the anticipated 14 days holiday over the festive period (December-January). An additional 7 days, after receiving the last assay, should provide enough time to finalise the report.

Bulk Sampling (Phase 3) (Months 3-58)

The Bulk sampling programme can be described two fold:

- Treatment of Historically Mined Dumps

The prospecting area has dump sources that was previously mined. The quantity and quality is not known but show indications of low to medium grade. 25-36% Manganese and a high silica and iron content is expected. These dump can be treated through a jigging to increase the grade to a sellable product.

- Virgin Pitting

This would be achieved through the use of machinery (TMM's) and a Jigging plant. Excavators are used to remove the overburden where it occur and stored in a dedicated area for final use in the rehabilitation programme. The manganese production material are then excavated through a pitting process. The planned dimensions of the excavations

are 50m X30m at planned intervals of 80 m in a checkered pattern on the targetted areas. The deviation to this prospecting program could be when a particular line of interest is encountered and the prospecting be done along a channel. The ore is then transported to the plant by means of Dump Trucks. The alluvial ore is introduced to the Jig Plant Receiving Bin by means of a Load Haul Dumper. The oversize material (waste+100mm) is used as backfill in the opened-up excavation areas. The overburden is placed on site where it is later backfilled into the pit, i.e. formations will be placed back in the same sequence it was extracted. The topsoil is then introduced to complete the rehabilitation process. Rehabilitation is thus continous.

It is exteremely difficult to determine the amount, pattern and size of the pits at this stage due to the inconsistancy of the manganese distribution and formation. The pits would be guided more accurately on completion of the exploration drilling program

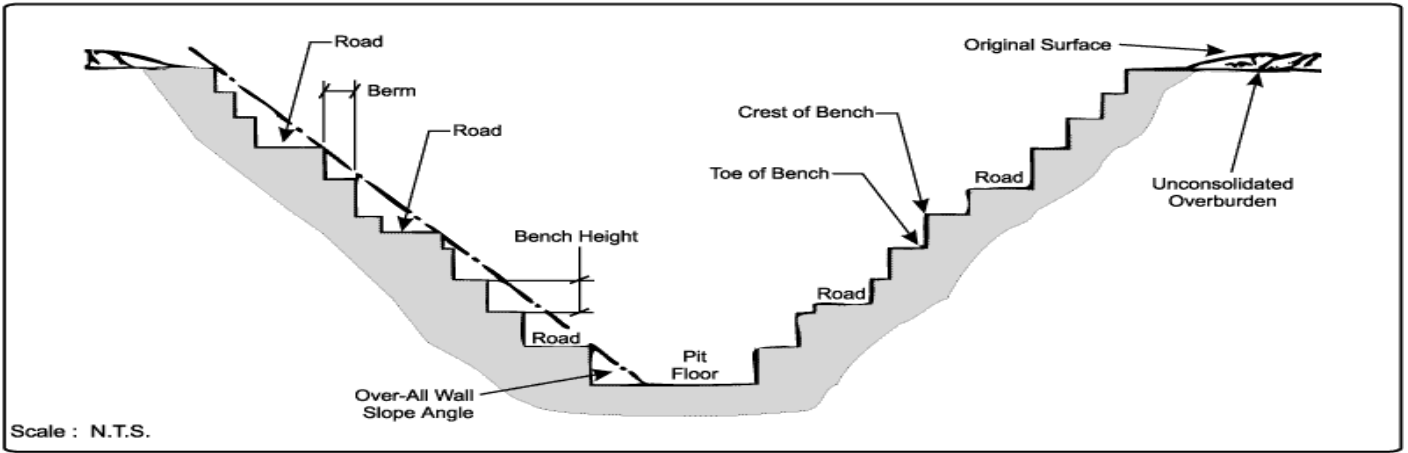
The ore is treated in a jig processing plant that consists of crushing and screening. The sizing would be -10mm; +10mm -40mm and the lumpy material +40-80mm. The prospecting program is based on a rejection of -28% manganese content at the current market requirement that could vary in future. The material would then be introduced to a magnetic seperator which will discriminate on the iorn ore content for rejection.

Trenches

20 Trenches of dimension 100m x 5m would be made to further quantify the extent of the orebody. The trenches would be closed completely before opening of a following trench.

ACTUAL JIG PLANT AND MAGNETIC SEPERATOR THAT WILL BE USED

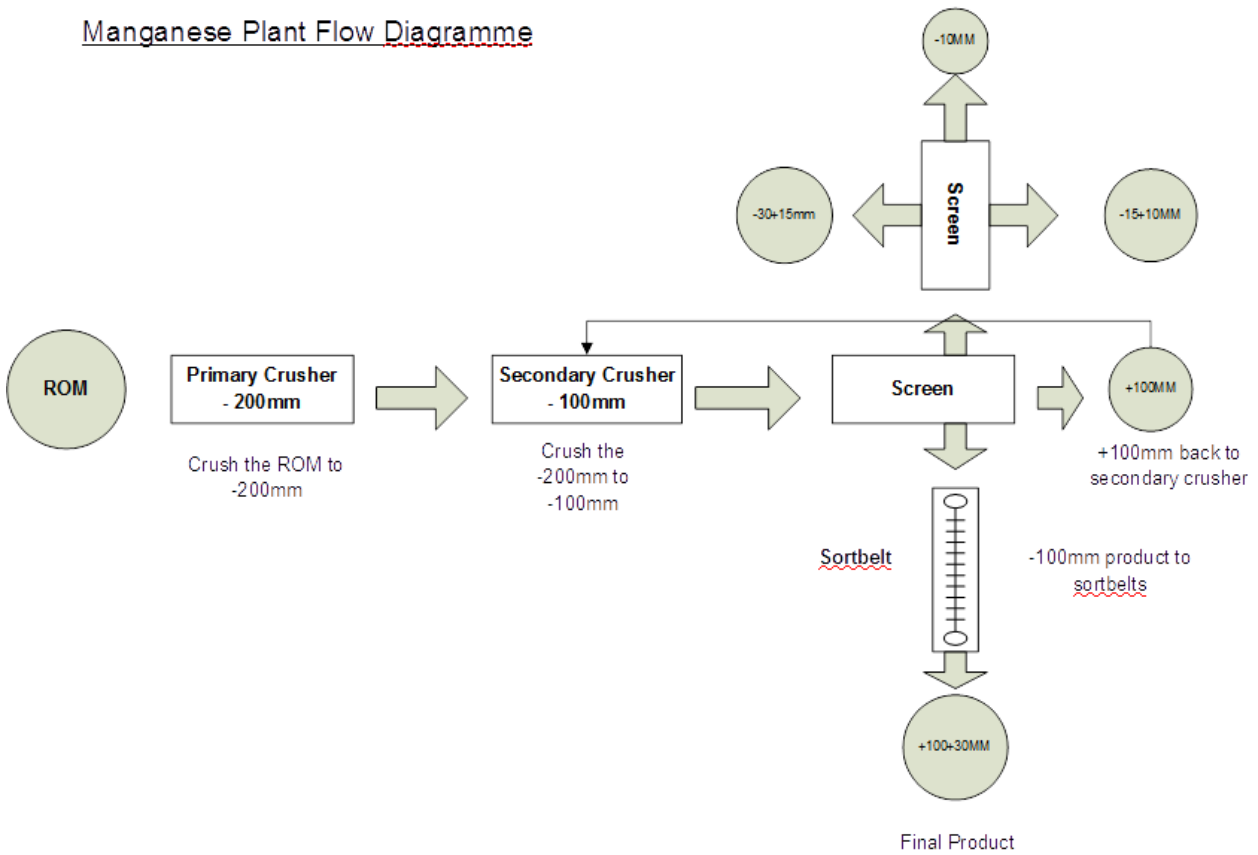




SCHEMATIC DIAGRAM A-SECTION OF PIT

LINEAR FLOW OF PROCESS

Manganese Plant Flow Diagramme



e) Policy and Legislative Context

<p>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</p> <p>(A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process);</p>	<p>REFERENCE WHERE APPLIED</p> <p>(i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)</p>	<p>HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT</p> <p>(E.g In terms of the National Water Act:- Water Use Licence has/has not been applied for).</p>
<p>Mineral and Petroleum Resource Development Act; 2002 (Act No.28 of 2002)(As Amended)</p>	<p>A Prospecting Right application</p>	<p>A Prospecting Right application has been lodged with the DMR Northern Cape Region</p>
<p>Mineral and Petroleum Resource Development Act; 2002 (Act No.28 of 2002)(As Amended)</p>	<p>A Prospecting Right Environmental Authorisation</p>	<p>In the process at DMR</p>
<p>National Environmental Management Act, 1998(Act 107 of1998) (As Amended)</p>	<p>Section 28 of the National Environmental Management Act, Act No. 107 of 1998 required duty of care where reasonable measures are taken to prevent pollution or degradation from occurring, continuing or recurring, or, where this is not possible, to minimise and rectify pollution or degradation of the environment. Section 29 addresses the protection of workers refusing to do environmentally hazardous work. Section 30 addresses procedure to be followed in the event of emergency incident which may impact on the environment. Access to environmental information and protection of whistle blowers are addressed in Section 31.</p>	<p>Part of Environmental Management Programme</p>
<p>National Environmental Management Act, 1998 (Act 107 of1998) (As Amended) Environmental Impact Assessment Regulations,2014(G38282-2982-985)</p>	<p>GNR 983: 2014 Regulations promulgated in terms of NEMA, Act No.107 of 1998: GNR 982,983,984 and 985 Government Gazette No. 38282 Pretoria, in terms of Chapter 5 of the National Environmental Management Act, Act No 107 of 1998 (as amended), contain the</p>	<p>In the process at DMR</p>

	EIA Regulations, as well as a schedule of activities that may have substantial detrimental effects on the environment and therefor required authorisation from the competent environmental authority.	
National Environmental Management Act: Biodiversity Act, 2004 (Act 10 of 2004)	Reforms the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.	To take note of
National Water Act, 1998 (Act 36 of 1998)	<p>In terms of the definitions contained in Section 1 of the National Water Act, Act No. 36 of 1998, a 'water resource' includes a watercourse, surface water, estuary or aquifer. "Aquifer" means a geological formation which has structures or textures that hold water or permit appreciable water movement through them. "Watercourse" means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows; and any collection of water which the Minister may, by notice in the Gazette declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks. The Minister of Water and Environmental Affairs is allowed to regulate activities which have a detrimental impact on water resource by declaring them to be controlled activities. No person may undertake a controlled activity unless such person is authorised to do so by or under the Act. Duty of Care to prevent and remedy the effects of pollution to water resource is addressed in Section 19. Section 20 address the procedure to be followed, as well as control of emergency incidents which may impact on a water resource.</p> <p>Recognised water uses are addressed in terms of section 21 and the requirements for registration of water uses are stipulated in Section 26 and 34.</p>	Take note of. No water required- Dry operation
World Heritages Convention Act, 1999 (Act 49 of 1999)	Protection of World Heritage Resources	Take note

<p>Environmental Conservation Amendment Act, 2003 (Act 50 of 2003) G26023</p>	<p>Section 25 of the Environmental Conservation Act, Act No 73 of 1989, as well as the National Noise Control Regulations GNR 154 dated 10 January 1992, regarding noise, vibration and shock, is applicable.</p>	<p>This is also legislated by Mine Health and Safety from DMR and will be adhered to.</p>
<p>National Environmental Management Act: Protected Areas Act, 2003 (Act 57 of 2003)</p>	<p>To provide for the management, conservation of protected areas of ecologically viable (natural landscapes and seascapes) areas in South Africa.</p>	<p>Take note</p>
<p>In terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999)</p>	<p>In terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), any person who intends to undertake "any development or other activity which change the character of a site – exceeding 5000m³ in extent" and the "construction of a Linear development or barrier exceeding 300m in length" must at the very earliest stages of initiating the development, notify the responsible heritage resources authority, viz, the South African Heritage Resources Agency and /or Department of Environment.</p>	<p>Consult Provincial Authority</p>
<p>Conservation of Agricultural Resources Act, Act No 43 of 1983</p>	<p>Section 5 of the Conservation of Agricultural Resources Act, Act No 43 of 1983, prohibits the spreading off weeds and Section 6 and Regulation 15 and 15E of GNR 1048 address the implementation of control measures for alien and invasive plant species. This aspect has been addressed in the Environmental Management Programme. This Act also make provision for the conservation of agricultural land.</p>	<p>Take note</p>
<p>National Forest Act, 190 (Act No. 84 of 1998)</p>	<p>National Forest Act, 190 (Act No. 84 of 1998) and Regulations, Section 7: No person may cut, disturb, damage or destroy any indigenous , living tree in a natural forest, except in terms of a licence issued under Section 7(4) or Section 23: or an exemption from the provisions of this subsection published by the Minister in the Gazette. Sections 12 – 16 deal with protected trees, with the Minister having the power to declare a particular tree, a group of trees, a particular woodland, or trees belonging to a certain species, to be a protected tree, group of trees, woodlands</p>	<p>Take note</p>

	<p>or species. In terms of section 15, no person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.</p>	
<p>Subdivision of Agricultural Land Act, Act 70 of 1970</p>	<p>Control the subdivision, and in connection therewith, the use of agricultural land. It also control long term leases over agricultural land. The applicant needs to apply for consent from the Department of Agriculture for these leases.</p>	<p>Take note</p>
<p>Section 17 of the Fencing Act, Act No.31 of 1983</p>	<p>States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1,5m on each side therefore and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.</p>	<p>Take note</p>
<p>Section 8 of the Atmospheric Pollution Prevention Act, Act No.45 of 1965</p>	<p>Section 8 of the Atmospheric Pollution Prevention Act, Act No.45 of 1965 regulating controlled areas, as well as section 27, with regard to dust control is still applicable.</p>	<p>Comply</p>
<p>The Occupational Health and Safety act, Act 85 of 1993 GNR 22810f 1987-10-16</p>	<p>Environmental Regulations for Workplaces are applicable.</p>	<p>Comply</p>
<p>The South African Civil Aviation Regulation Act, Act 13 of 2009.</p>	<p>Controls marking of structures that may influence aviation through the Civil Aviation Technical Standards, SA-CATS-AH 139.01.33 Obstacle Limitations and Markings outside Aerodrome or Heliports. It states that any structure exceeding 45m above ground level, or structures exceeds 150m above the MEAN ground level, like on top of a hill, the mean ground level considered to be the lowest point in a 3km radius around such structure. Structures lower than 45m, which are considered as a danger or a potential danger to aviation, shall be marked as such when specified. Overhead wires, cables, etc., crossing a river, valley or major roads shall be marked and in addition, their supporting towers marked and</p>	<p>Take note</p>

	lighted if an aeronautical study indicate that it constitute a hazard to aircraft.	
--	--	--

f) Need and desirability of the proposed activities.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

Desirability of the Project:

- Creation of employment opportunities to the Griquatown community in the mining sector.
- Skills transfer of employees through training which will be used after the end of life span of the prospecting program.
- Poverty Eradication through income
- Advancement and support to BEE suppliers of consumables to the project.
- Engagement of women in mining
- Ensure the optimal use of mining resources
- Improve the lack of entrepreneurship
- Underutilization of the regions natural resources and economic opportunities
- Lack of investment in the region
- The availability of bursaries, internships and training programs that would impact on the employment opportunities of the youth if proceeded with the mining right application with reference to the Social and Labour Plan.

g) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site.

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

The manganese resources are very specific in their nature, location and extent. This fact dictated the type of activity that would be employed in its placement to successfully quantify the grade of the resource. The fact that iron ore is also a mineral found on the study area compound the prospecting activity. It is also required to have the processing plant as close as possible to the bulk sampling pits to minimise the destruction of vegetation for on-mine (bulk sampling) roads, and reduce the operational cost of transport. The option that would be employed is a jig plant with a magnetic separator. processing arrangement that is an acceptable practise in the South African mining fraternity mainly due to the following reasons.

- Use will be made of a mobile plant which is easily moveable and requires no permanent structures to be erected.

The preferred site on the farm will have the least disturbance and risk to the environment as it has been disturbed by previous mining activities (Lime- Chem Iron Ore Operation). The preferred site and activities will therefore be a low impact operation with minimal destruction to the fauna and flora. Current established farm roads will be used as access roads. It would also be the least interference with current activities on the farm and adjacent properties. There is no alternative prospecting method which will be more effective in terms of cost and protection of the environment as the drilling, trenching and bulk sampling programme.

Alternative considered to the Dry Jig Plant Process.

The initial design of the Jig Plant was to make use of water during the metallurgical process to minimise contamination to the manganese ore. The alternative would be a dry process due to the scarcity of water on the study area and surroundings. The alternative of a dry process would be employed.

The process that was followed is a selection engineering process which weight the following factors:

Weighing Factors	Impact
Proximity of neighbouring farms	Noise, Dust and Visibility.
Rehabilitation	Cost and effectiveness of the rehabilitation program in relation to other alternative sites on the study area
Definition of the infrastructure in relation to the prospecting resource	Destruction of Fauna and Flora when developing prospecting infrastructure, access roads and plant with other complimentary infrastructure.
Water supply infrastructure	Borehole and the impact thereto
Landowner input	Land capability after mining
Griekwastad Town	Socio-Economic and Cultural impact
Topography	Erosion factors
Geology	Sterilization of mineral resource

RESOURCE STATEMENT FOR PROSPECTING
Table : Bulk Sampling Activities

ACTIVITY		DETAILS		
Number of pits/trenches planned		90		
Dimensions of pits/trenches, per pit/trench	Number of pits/trenches	Length	Breadth	Depth
	9	50m	30m	12m
Locality		Bulk sampling positions cannot be determined at this stage and is dependant on the outcome of the Exploration Drilling Report and Continuous Bulk Sampling Program. The only finite is the dump treatment.		
Volume Overburden (Waste)		16200		
Volume Ore		162000		
Density Overburden		2.4		
Density Ore		4		
Phase(s) when bulk sampling will be required		3		
Timeframe(s)		Months 3-58		

i) Details of the development footprint alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

- (a) The properties where the prospecting programme will be conducted is known as Farm Name and Number: Nek 106 Measuring 2589.4461 ha, Portion 1 Cairntoul 189 Measuring 1071.0447 ha, Remainder /Extent Cairntoul 189 Measuring 1960.1750 ha, Magisterial district of Hay, Northern Cape. The applicant did not consider an alternative to the location as a quantifiable resource is not known.
- (b) Prospecting would be done through drilling, trenching and bulk sampling programme to determine the extent of the ore body, the quality, grade and distribution of the of the manganese ore. The alternative considered was a mining permit application which would not have allowed the applicant to conduct a more confident programme to determine the extent of the orebody. The inclusion of the trenching programme makes the spatial arrangement of the programme to extent over more than a 5 ha area. A mining permit allows an application area of 5ha or less..
- (c) The design of the activity is a flow from the excavations or pitting, stockpiling of topsoil, screening of the bulk sampling material, processing through a jig plant and introduction to a magnetic separator that will discriminate on the iron ore content for rejection. This will be a dry jigging process.
- (d) The design of the process is a proven and acceptable practice in the iron and manganese mining fraternity in South Africa. It consists of primary crushing and screening, jigging and the introduction to a magnetic separator. The equipment is all mobile and can be easily moved and relocated. The alternative of a wet jigging process was considered but due to the scarcity of water in the area was not pursued.
- (e) Each aspect of the activity is interdependent on the previous process. No alternative was considered as this will have a nett effect of the total activity not to be completed. The operation should therefore be arranged to have the shortest el distance between these primary aspects.
- (f) The prospecting operation if it continuous will make provision for at least 13 job opportunities. The opportunity to employ women in mining would be lost. Tax benefits to the state as well as the promotion and stimulation of BEE enterprises and businesses around Griekwastad. The mineral resource would remain sterilised.

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

INTERESTED AND AFFECTED PARTIES SCOPING PHASE

CONSULTATION WITH FARM OWNERS:

The Title Deed shows Die Trustees van die Snymansnek Trust, Registration IT980/99 as owner of the application farms. The EAP visited the farm in and around February 2018 to discuss the application with the Trust Representative and was met by his wife Mrs Claudine Snyman who confirmed that she is the Trust representative's wife and that he is currently not available. She referred all consultation to their legal representative Mr Gerhard Laufs.

I request access to conduct an Environmental Impact Assessment to which my request was denied. She informed me that access to the farm Nek 106 and the Cairntoul farms should be through their lawyer who will handle any consultations regarding the application. She made his phone number available to me. Calls to the lawyer Mr Gerhard Laufs remain unanswered and a subsequent sms on 1st March 2018 has been forwarded and proof hereunder submitted as evidence.

The Trust Representative Mr Wikus Snyman, however attended the public meeting held on 22nd March 2018 held at the Karikama Secondary School in Griekwastad. Communication to the Trust Representative has now been established.

E@mail

Emails have been received from N van der Vyfer as well as L D Snyman and others for registration on the application database. The emails and correspondence with the EAP is attached as APPENDIX A for completeness.

The placing of the Public Participation Boards had response from numerous I&A and who also attended the Public meeting on the 22nd March 2018. Proof of the boards placed on the farm entrances in the form of pictures are herewith submitted as evidence. Complaints of some of the boards being destroyed by weather conditions was raised by a concerned party Mrs van der Vyfer from a neighbouring farm Caimtop (as per email) (Kryntop as per attendance register).

INTERESTED AND AFFECTED PARTIES DATABASE

FARM	OWNER/OCCUPANT	CONTACT DETAILS
Nek 106	DIE TRUSTEES VAN DIE SNYMANSNEK TRUST Nr. IT 980/99 Wikus Snyman (Trustee)	hunt@snymansafaris.co.za
Portion 1 Cairntoul 189	DIE TRUSTEES VAN DIE SNYMANSNEK TRUST Nr. IT 980/99 Wikus Snyman (Trustee)	hunt@snymansafaris.co.za
Caimtop (Kryntop)	W van der Vyfer	kryntop@gmail.com
Neighbour Nek 107 (as per email) and Cairntoul 189	LD Snyman Boerderye (PTY) LTD	Care of: leendert@webmail.co.za 0832868496
Neighbour Nek 107 (as per email) and Cairntoul 189	Raasop Boerdery Bk	Care of: leendert@webmail.co.za 0832868496
Farming on Sandridge 191 and Park 107		

Neighbour Nek 107 (as per email) and Cairntoul 189	Leendert Dekker Snyman	leendert@webmail.co.za 0832868496
Farming on Sandridge 191 and Park 107		
Remainder /Extent Cairntoul 189	DIE TRUSTEES VAN DIE SNYMANSNEK TRUST Nr. IT 980/99 Wikus Snyman (Trustee)	hunt@snymansafaris.co.za
All Application Farms	Gerhard Laufs Legal Representatives	0832346569
Reginal Smous	Community Meeting Representative	0722723654 rsmous@gmail.com
Petrus Mouers	Community Meeting Representative	0726252536 mouerspetrus@gmail.com
Lukas Waterboer	Community Meeting Representative	0737738449 waterboerlukas@gmail.com

SMS TO LEGAL REPRESENTATIVE MR GERHARD LAUFS.



ADVERTISEMENT

An advertisement of a public meeting was placed in the Diamond Fields Advertiser (DFA) on Monday, 5th March 2018.

<h1>053 832 6261</h1>	<p>Time: 10:00 am on 15 March 2018.</p>
<p>DIVISION: PD AND RESEARCH CPTD PROVINCIAL COORDINATOR 1-YEAR FIXED CONTRACT</p> <p>Salary: R308 411.00 p.a. (Salary Band: C3) (No Benefits)</p> <p>SACE is inviting applications from interested individuals, to be appointed as the SACE CPTD Provincial Coordinator in the NORTHERN CAPE.</p> <p>Appointment will be on a one-year fixed contract. Selected individuals will be offered training before they commence with duties. You will be required to report to SACE Provincial Office // when an Office exist in addition to Liaising with the Operational Manager at SACE Head Office.</p> <p>Requirements, skills and experience: • A recognised and appropriate three-year post matriculation or equivalent educational qualification at degree level • At least five (5) years' experience at Managerial level or managerial experience in the education system • Extensive knowledge of the South African Education System • Knowledge and understanding of the CPTD Management System • Ability to monitor and evaluate the implementation of the CPTD Management System in the province and produce the necessary reports • Experience in the supervision of educators (school/office-based) • Knowledge of the National Policy Framework on Teacher Education and Development in South Africa (2007), Integrated Strategic Plan for Teacher Education and Development in South Africa (2011), and the CPTD System Handbook • Knowledge of other relevant education policies and legislation • Strong verbal and written communication as well as computer skills are essential • Willingness to work extensive hours and to travel • A valid driver's licence • Own transport and computer with electronic mail facilities • Passion for making a positive contribution to South African education.</p> <p>The SACE CPTD Coordinators should take the lead in coordinating and implementing the CPTD system at provincial level with the support of the PEDs.</p> <p>Under the supervision of SACE they will specifically: Send your application letter for the position applied for, accompanied by a comprehensive CV, and certified copies of ID and qualifications.</p> <p>Please forward your application, to the Human Resource Unit: Private Bag X127, CENTURION, 0046 or hand deliver to: The Human Resource Unit, SACE Building, 240 Lenchen Avenue (corner Jean Avenue) CENTURION.</p> <p>Correspondence is limited to short-listed applicants.</p> <p>Closing date for applications is the 14 March 2018.</p> <p>Direct your queries to: Mary Chauke, tel. (012) 563 0429 or Mpho Moko, tel. (012) 563 0422.</p> <p>NB. NO FAXED or E-MAILED APPLICATIONS WILL BE ACCEPTED AND NO Z83 FORM.</p>	<p>EIA PUBLIC PARTICIPATION HARD ROCK EXPLORATION MN2 (PTY) LTD</p> <p>has in terms of the Mineral and Petroleum Resources Development Act, 2002, (Act 28 of 2002 as amended), the National Environmental Act, 1998, (Act 107 of 1998 as amended), lodged an application for a Prospecting Right with The Department of Mineral Resources, Northern Cape Province, on Farms:</p> <ul style="list-style-type: none">(1) Nek 106,(2) Portion 1 Cairntoul 189(3) Remainder /Extent Cairntoul 189, situated in the Magisterial District of Hay, Northern Cape <p>Reference Number NC 30/5/1/1/2/1214 PR</p> <p>Mineral: Manganese</p> <p>All Interested and/or Affected parties are hereby invited to register on the application database (goliathmalcolm@yahoo.com), or lodge any complaints in writing to:</p> <p>M A Goliath 23 Goedehoop Avenue Royldene Kimberley 8301</p> <p>Notice is also given of a public meeting that will be held at Hoerskool Karikama, Griquatown</p> <p>Time: 10:00 am on 22 March 2018.</p>

PUBLIC NOTICE BOARDS

Public Notice Board with the following contents of dimensions 60cmX42cm was placed on the farm entries.

EIA PUBLIC PARTICIPATION PROCESS

HARD ROCK EXPLORATION MN2 (PTY) LTD has in terms of the Mineral and Petroleum Resources Development Act, 2002, (Act 28 of 2002 as amended), the National Environmental Act, 1998, (Act 107 of 1998 as amended), lodged an application for a Prospecting Right with The Department of Mineral Resources, Northern Cape Province, on Farms:

- Nek 106 ,
- Portion 1 Cairntoul 189
- Remainder /Extent Cairntoul 189, situated in the Magisterial District of Hay, Northern Cape

Reference Number NC 30/5/1/1/2/1214 PR

Mineral: Manganese

All Interested and/or Affected parties are hereby invited to register on the application database (goliathmalcolm@yahoo.com), or lodge any complaints in writing to:

M A Goliath
23 Goedehoop Avenue
Royldene
Kimberley
8301

Notice is also given of a public meeting that will be held at Hoerskool Karikama, Griquatown
Time: 10:00 am on 22nd March 2018.



NEK 106 : Public Participation Board



CAIRNTOUL Board : Both Cairntoul farms are only accessible through these gates.



LIBRARY : Placement of Public Participation Board

PUBLIC MEETING

A Public meeting was held on the 22nd March 2018 at the Town Hall, Griquatown at 10:00. Minutes of the meeting attached as Appendix B.

CONSULTATION WITH MUNICIPALITY

e@mail forwarded to the Municipal Manager. Appendix C.

GOVERNMENT DEPARTMENTS

Hand Delivered letters to inform the Departments of the Project through the BID document. The BID document is attached as Appendix D. Final consultation with the forwarding of the Draft Environmental Impact Report and Environmental Management Programme :

Environment, Agriculture and Water and Sanitation

Consultations on-going

LIME-CHEM RESOURCES (PTY) LTD
Holder of Iron Ore Mining Right over the Application Properties



RESOURCES (PTY) LTD

17 A Hull Street
De Beers
Kimberley
8301
Tel: 053 832 6689
Email: mbanga777@gmail.com

18 October 2017

Department of Mineral Resources
65 Phakamile Mabija Street
Perm Building
Kimberley
8301

Dear Sir/Madam,

RE: APPLICATION FOR PROSPECTING RIGHT HARD ROCK EXPORATION MN2 (PTY) LTD.

We wish hereby to confirm that we have no objection to the granting of the prospecting right in respect of the above mentioned application.

Thank you for your time and consideration in dealing with this matter.

Yours faithfully,

A handwritten signature in black ink, appearing to read "M. Banga".

Marcus Mzolisi Banga
Director

Directors: Ric Blackwell; Nick Clarke; Marcus Banga

INTERESTED AND AFFECTED PARTIES

SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

I&A	ISSUES RAISED	INCORPORATION INTO SCOPING REPORT
Public Meeting	Scarcity of Water	Dry Metallurgical Process Adopted by applicant

**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL
MANAGEMENT PROGRAMME STAGE**

FARM	OWNER/OCCUPANT	CONTACT DETAILS	INPUT
Nek 106	DIE TRUSTEES VAN DIE SNYMANSNEK TRUST Nr. IT 980/99 Wikus Snyman (Trustee)	hunt@snymansafaris.co.za	AWAITING INPUT
Portion 1 Cairntoul 189	DIE TRUSTEES VAN DIE SNYMANSNEK TRUST Nr. IT 980/99 Wikus Snyman (Trustee)	hunt@snymansafaris.co.za	AWAITING INPUT
Caimtop (Kryntop)	W van der Vyfer	kryntop@gmail.com	AWAITING INPUT
Neighbour Nek 107 (as per email) and Cairntoul 189	LD Snyman Boerderye (PTY) LTD	Care of: leendert@webmail.co.za 0832868496	AWAITING INPUT
Neighbour Nek 107 (as per email) and Cairntoul 189 Farming on Sandridge 191 and Park 107	Raasop Boerdery Bk	Care of: leendert@webmail.co.za 0832868496	AWAITING INPUT
Neighbour Nek 107 (as per email) and Cairntoul 189 Farming on Sandridge 191 and Park 107	Leendert Dekker Snyman	leendert@webmail.co.za 0832868496	AWAITING INPUT
Remainder /Extent Cairntoul 189	DIE TRUSTEES VAN DIE SNYMANSNEK TRUST Nr. IT 980/99 Wikus Snyman (Trustee)	hunt@snymansafaris.co.za	AWAITING INPUT
Lime-Chem Resources (PTY) LTD	Mr Marcus Banga	0538326689 mbanga777@gmail.com	AWAITING INPUT
All Application Farms	Japi van Zyl Attorneys Gerhard Laufs Legal Representatives	Email: 0832346569	AWAITING INPUT (OBJECTION RECEIVED) Response send on Objection. 5 calls made to cellphone and one to the Japie van Zyl Prokureur offices. No response received as at 16 July 2018.
Reginal Smous	Community Meeting Representative	0722723654 rsmous@gmail.com	AWAITING INPUT
Petrus Mouers	Community Meeting Representative	0726252536 mouerspetrus@gmail.com	AWAITING INPUT
Lukas Waterboer	Community Meeting Representative	0737738449 waterboerlukas@gmail.com	AWAITING INPUT

REGISTERED ON DATABASE

Emails:

7/16/2018

goliathmalcolm@yahoo.com - Yahoo Mail

The screenshot displays the Yahoo Mail interface. The top navigation bar is purple with the 'YAHOO! MAIL' logo on the left, a search bar in the center, and user profile icons on the right. Below the navigation bar, a toolbar contains icons for 'Back', 'Forward', 'Archive', 'Move', 'Delete', and 'Spam'. The main content area shows an email from Malcolm Goliath (goliathmalcolm@yahoo.com) with the subject 'Hard Rock MN2 Prospecting Right Application'. The email body includes a greeting, a request for input on a Draft EIA and Right Application by August 16, 2018, and a PDF attachment named 'Draft 5_and_...pdf'. A contact card for Petrus Mours (mourspetrus@gmail.com) is visible over the email content. The left sidebar shows the 'Sent' folder selected, with a list of other folders like 'Inbox', 'Unread', and 'Drafts'.

GOVERNMENT DEPARTMENTS

Draft Environmental Impact Assessment Report and Environmental Management Programme will be forwarded to on 18 July 2018:

Agriculture, Environment, Water and Sanitation

Other Competent Authorities

Mc Gregor Museum

SAHRA

Department Mineral Resources-Northern Cape
BY SAMRAD on 16 July 2018

iii) Summary of issues raised by I&Aps
 (Complete the table summarising comments and issues raised, and reaction to those responses)

Interested and Affected Parties		Date	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Comments Received			
<u>AFFECTED PARTIES</u>					
Landowner/s DIE TRUSTEES VAN DIE SNYMANSNEK TRUST Legal Representative Japie Van Zyl Prokureurs	X		Objection Lodged Awaiting Input to Draft EIA and EMPr	Consultation REMDEC involvement Awaiting Input	
Lawful occupier/s of the land DIE TRUSTEES VAN DIE SNYMANSNEK TRUST Legal Representative Japie Van Zyl Prokureurs	X			Awaiting Input	
Landowners or lawful occupiers on adjacent properties	X			Awaiting Input	
LD Snyman Boerderye (PTY) LTD	X			Awaiting Input	

Neighbour Nek 107 (as per email) and Cairntoul 189					
Raasop Boerdery Bk Neighbour Nek 107 (as per email) and Cairntoul 189 Farming on Sandridge 191 and Park 107	X			Awaiting Input	
Leendert Dekker Snyman Neighbour Nek 107 (as per email) and Cairntoul 189 Farming on Sandridge 191 and Park 107	X			Awaiting Input	
W van der Vyfer Caimtop (Kryntop)	X			Awaiting Input	
Marcus Banga Lime-Chem Resources (PTY) LTD	X			Awaiting Input	
Municipal councillor					
Municipality Municipal Manager	X			Awaiting Input	
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA					
DWS	X			Awaiting Input	
Communities	X		No Communities on study area. Public meeting held on 16 March 2018		
Dept. Land Affairs Commission for Land Rights	X		No Claim on farms	Awaiting Input	
Sports, Arts, Culture and Recreation, Heritage Section Traditional Leaders	X		None Received		
No Traditional Leaders Identified					
Dept. Environmental Affairs and				Awaiting Input	

Agriculture					
Water and Sanitation	X			Awaiting Input	
Department Mineral Resources	X		By SAMRAD	Awaiting Input	
Other Competent Authorities affected					
SAHRA	X			Awaiting Input	
Mc Gregor Museum	X			Awaiting Input	
<u>OTHER AFFECTED PARTIES</u>					
Reginal Smous Community Meeting Representative		X		Awaiting Input	
Petrus Mouers Community Meeting Representative		X		Awaiting Input	
Lukas Waterboer Community Meeting Representative		X		Awaiting Input	
<u>INTERESTED PARTIES</u>					
Reginal Smous Community Meeting Representative		X		Awaiting Input	
Petrus Mouers Community Meeting Representative		X		Awaiting Input	
Lukas Waterboer Community Meeting Representative		X		Awaiting Input	

- iv) **The Environmental attributes associated with the development footprint alternatives.**(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity.

(its current geographical, physical, biological, socio- economic and cultural character).

**GEOLOGY AND GEOGRAPHY
GEOLOGICAL INFORMATION**



GEOLOGICAL SETTING

1. INTRODUCTION

The area forms part of the inland plateau of South Africa with elevations generally at about 1400m above mean sea level. The topography is of the inselberg type, displaying rounded or sharp crested peaks and ridges projecting through sand, dolomite or calcrete covered flats.

The regional geological setting is located in the Griqualand West Basin which forms part of the Transvaal Sequence along the Kaapvaal Craton.

This Griqualand West Basin is complicated by faulting and the area is characterised by this faulting that occurs. A further characterizing factor is the dolomite and limestone underlain found in the Griqualand West Basin.

The geology on Rooinekke and the Cairntoul area contains Iron and Manganese ore mineralization.

The manganese in the area is of medium grade and was mined in the past.

The Transvaal Super Group was deposited in two structurally controlled basins (Button, 1976a) i.e. Transvaal and Griqualand West (Fig.1).

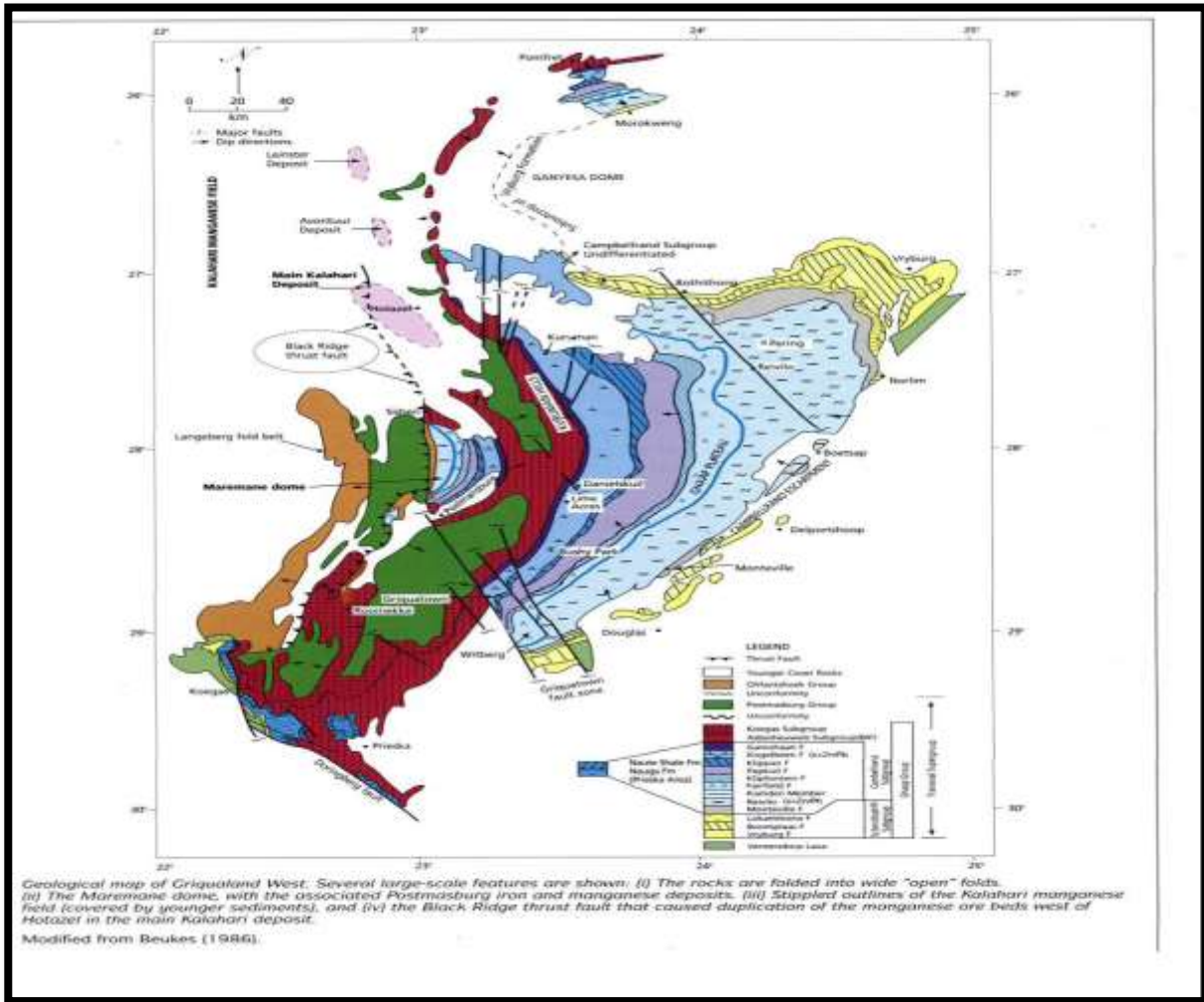


Figure 1: Geological map of Griqualand West (modified from Beukes (1986))

SUPER-GROUP	GROUP	SUB-GROUP	FORMATION	MAJOR LITHOLOGY	APPROX. THICKNESS in m.	
TRANSVAAL	OLIFANTS-HOEK	VOEL-WATER	VERWATER	Grey quartzite	3500	
			GLEN LYON	Brown quartzite		
			ELLIES RUS	Grey quartzite		
			FUTLER	Brown quartzite		
			HARTLEY	Andesitic lava		
			LUCKNOW	Purple and white quartzite		
	POSTMASBURG	VOEL-WATER	MAPEDI	Shale, quartzite, lava Basal iron-rich conglomerate	10-1500	
			MOOIDRAAI	Laterally into	250	
			HOTAZEL	BEAUMONT		
			ONGELUK		Andesitic lava	900
	GHAAP	KOE-GAS	MAKGANYENE	Diamictite	50-160	
			ROOINEKKE & NELANI	Iron-formation, shale	300	
	TRANSVAAL	OLIFANTS-HOEK		GAMAGARA (Correlative of Mapedi)	Quartzite and shale, basal iron-rich conglomerate	290
				KOE-GAS	MANGANORE*	Correlative of Asbeshuuwels
		WOLHAARKOP*	Solution collapse breccia		Siliceous chert breccia	
ROOINEKKE			Iron-formation		100	
NARAGAS			Quartz wacke, shale		240-600	
KWAKWAS			Riebeckitic slate			
DORADALE			Iron-formation			
ASBES-HEUWELS			PANNETJIE	Quartz wacke, shale	200-300	
			GRIQUATOWN	Clastic-textured iron-formation		
CAMPBELLRAND		SCHMIDTSDRIF	KURUMAN*	* On Maremane dome Manganore and Wolhaarkop	Microbanded iron-formation	150-750
			GAMOHAAN	Laterally into NAUTE and NARAGAS	Sparry limestone, shale	1500-1700
			KOGELBEEN		Dolomite, limestone	
			KLIPPAN		Cherty dolomite	
			PAPKUIL		Dolomite	
			KLIPFONTEIN-HEUWEL		Cherty dolomite	
	FAIRFIELD		Sparry dolomite			
	REIVILO		Micritic dolomite			
	MONTEVILLE		Dolomite, limestone, shale			
	LOKAMMONA		Shale		10-250	
BOOMPLAAS	Dolomite, limestone, shale					
VRYBURG	Quartzite, shale, lava					

Table 1: TRANSVAAL SUPER GROUP STRATIGRAPHY (after Beukes and Smit, 1987a, as amended by Hälbich et al., 1993)

In Griqualand West the succession can be broadly subdivided into a basal, chemical sedimentary unit, referred to as the Ghaap Group, which is overlain by a mixed volcanic-clastic-chemical sequence, known as the Postmasburg Group (Table 1). The Ghaap and Postmasburg Groups represent two separate, major unconformity-bounded sequences (Cheney and Winter, 1995).

According to Beukes (1983 and 1987), deposition of the Transvaal sequence in Griqualand West took place on a continental margin or trailing edge and was controlled by three tectonic-sedimentary elements:

- A shallow water platform on the Kaapvaal Craton.

- A platform edge (shelf margin) located parallel to the Griquatown fault zone (A growth fault across which there are a number of facies changes).
- A deep basin along the western margin of the Kaapvaal Craton (Fig 4).

3. THE GHAAP GROUP

The Ghaap Group is subdivided, from the base upward, into the Schmidtsdrif Subgroup (interbedded siliclastics and carbonates), The Campbellrand Subgroup (carbonates), the Asbesheuvel Subgroup (iron formation) and the Koegas Subgroup (interbedded siliclastics and iron formations) (Table1 and Fig. 1). Carbonates from the Schmidtsdrif Subgroup have been dated at 2557 ± 49 Ma by Pb-Pb method (Jahn et al, 1990). The lower Asbesheuvel Subgroup (Kuruman Iron Formation) has been dated at 2432 ± 31 Ma using single zircons from ash beds (Trendall et al, 1990).

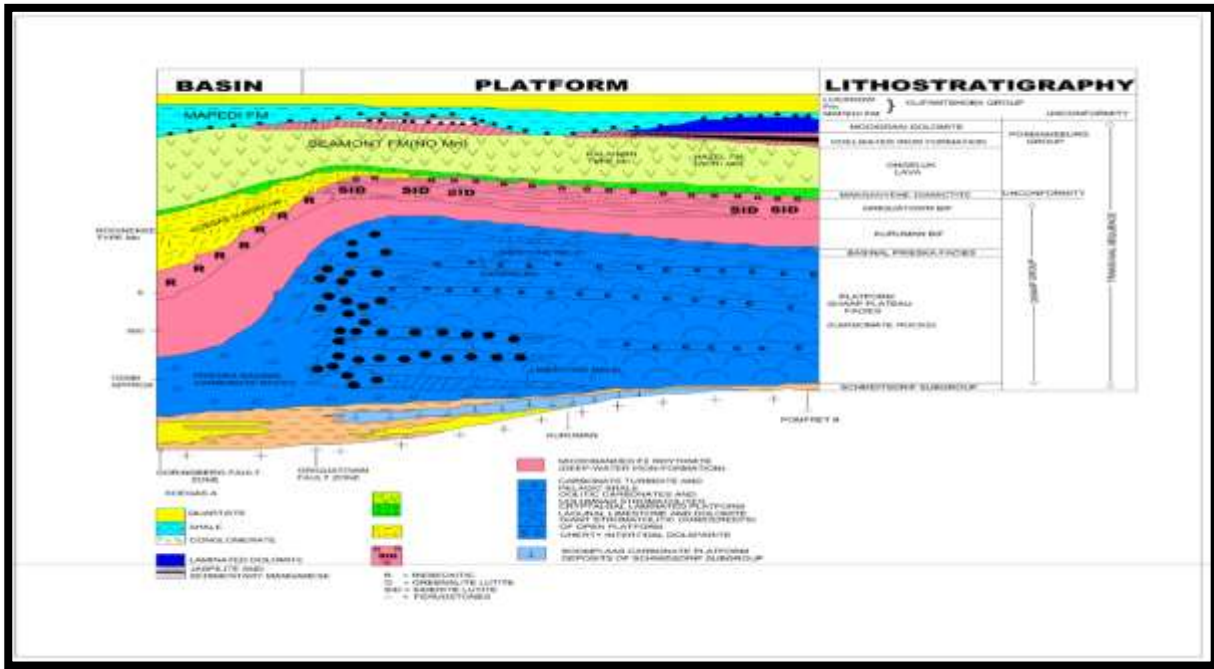


Fig.4 North-south section illustrating the relationships of the stratigraphic and sedimentological facies in the Transvaal Supergroup of Griqualand West.

The line of section is indicated in Fig. 5 (after Beukes, 1986).

3.1 The Schmidtsdrif Subgroup

The basal Schmidtsdrif Subgroup comprises fluviially deposited feldspatic quartz arenites, shallow marine and intertidal quartz arenites as well as a plat formal carbonate sequence (Beukes, 1979).

3.2 The Campbellrand Subgroup

The Campbellrand Subgroup consists of stromaolitic dolomite and limestone platform facies, which interfingers down slope with carbonate turbidites (Fig. 4). The turbidites have been ankerized and silicified to form banded ferruginous chert. Toward the south the turbidites interfinger with carbonaceous shale (Prieska facies), which, according to Beukes, relates to deposition within an euxinic basin, in front of the carbonate platform.

3.3 The Asbesheuvel Subgroup

Shallow water carbonate deposition was terminated during a major transgression, which drowned the shelf, resulting in a fairly sudden transition from carbonates through cherts and into the banded iron formation of the Asbesheuvel Subgroup (Fig. 4).

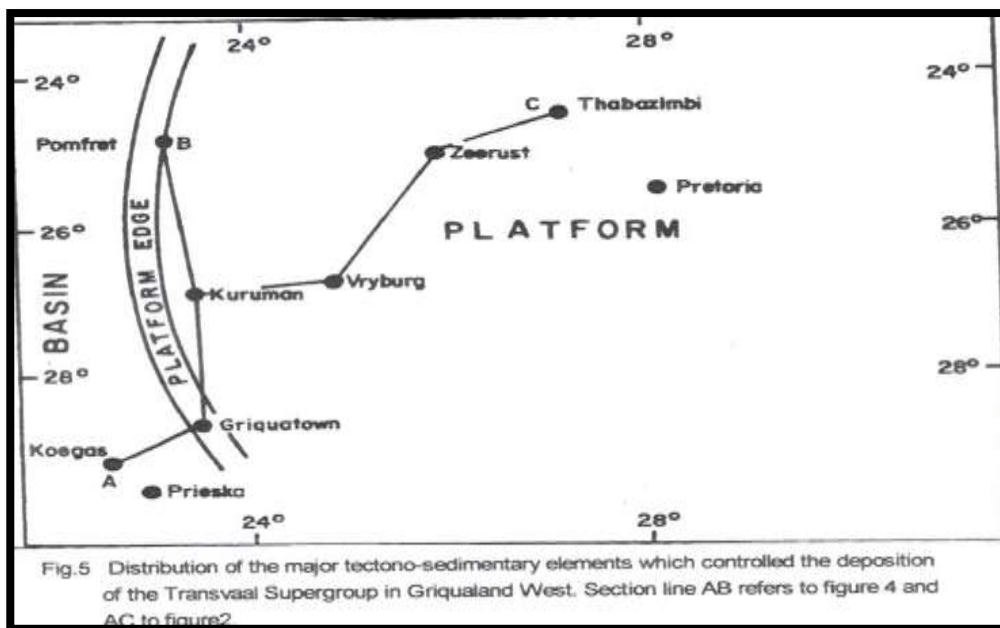
Beukes, 1978 subdivided the Asbesheuwel Subgroup into the Kuruman Iron Formation at the base followed by the Griquatown Iron Formation at the top (Table 1). According to Beukes the Kuruman Iron Formation was deposited within a deep shelf setting over the entire Kaapvaal Craton. It comprises an upward-shallowing sequence consisting of carbonaceous shale deposited in an euxinic basin, ankerite-banded chert, representing distal carbonate turbidites which was deposited in a transition zone, between the euxinic basin and the open shelf. Magnetite-hematite-chert micro banded rhythmite macrocycles containing interbedded stilpnomelane band- lutites, were deposited on the deep open shelf, while greenalite-siderite rhythmites mark the toe-of-slope and slope areas of a shallow water platform. The Ouplaas Member, which marks the top of the Kuruman Iron Formation, represents a clastic-textured shallow-water platform deposit (Beukes, 1983 and 1984).

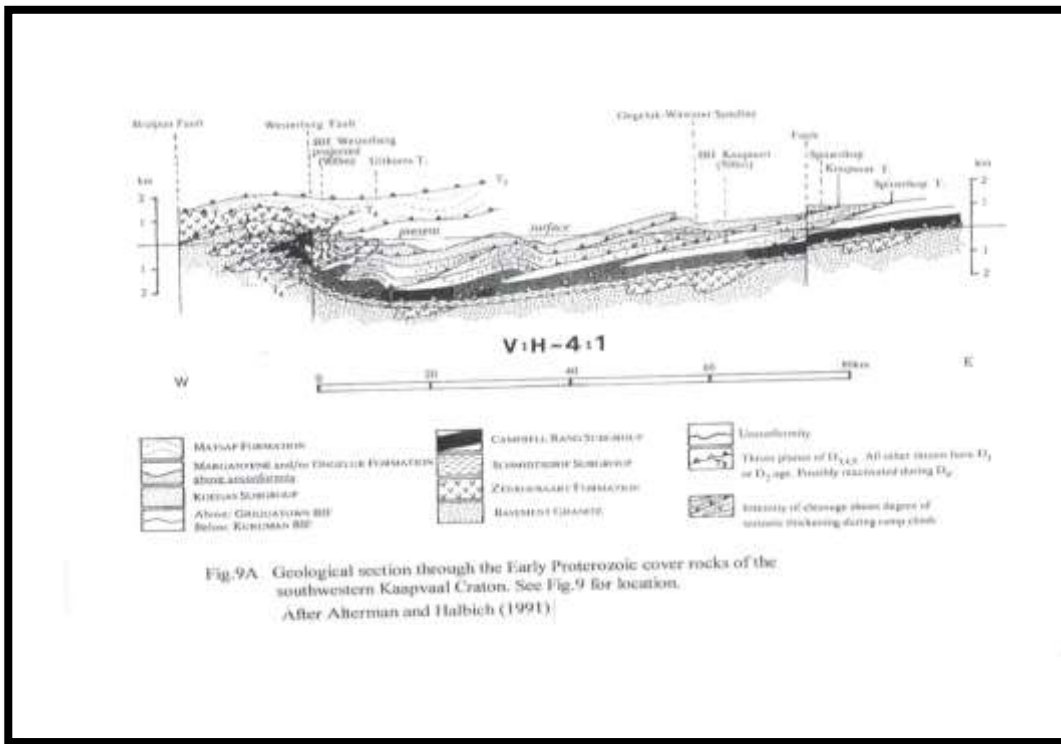
The Griquatown Iron Formation overlies the Kuruman Iron Formation and consists of upward coarsening megacycles, deposited in environments that vary from low energy, subtidal to high energy, intertidal and lagoonal settings.

3.4 The Koegas Subgroup

The Koegas Subgroup was only deposited down slope and within the deeper part of the basin toward the south (Prieska area) and is absent toward the north (Sishen) (Fig. 4). The Koegas Subgroup was deposited during a transgressive phase and comprises a quartz-chlorite-mudstone unit at the base followed upward by iron formations with interbedded quartz-wackes, with more iron formations, containing interbedded carbonates toward the top. The Koegas Subgroup was subdivided by Beukes; (1978), from the base upward into the following formations (Fig. 3):

- Pannetjie Formation: Quartz-chloritic mudstone.
- Dorasdale Formation: Iron-lutites.
- Kwakwas Formation: Greenalite-lutites and interbedded quartz-wackes.
- Naragas Formation: Mudstones and carbonates.
- Rooinekke Formation: Iron band-lutites.
- Nelani Formation: Mudstones with interbedded limestone, chert and grit beds.





OUTCROPS and PREVIOUS MINING

The study area has previously been mined for Iron ore and to a lesser extent manganese. The manganese show outcrop on the property and early indications are that it is of low to medium grade. The sampling of the dump material through an accredited laboratory is required to confirm the grade.

GEOGRAPHICAL ENVIRONMENT

The project area is characterised by rolling hills with gentle to moderate slopes, as well as hill pediment areas with open shrubveld. The study area is located at an elevation of approximately 1100-1800m above sea level.

CLIMATIC CONDITIONS

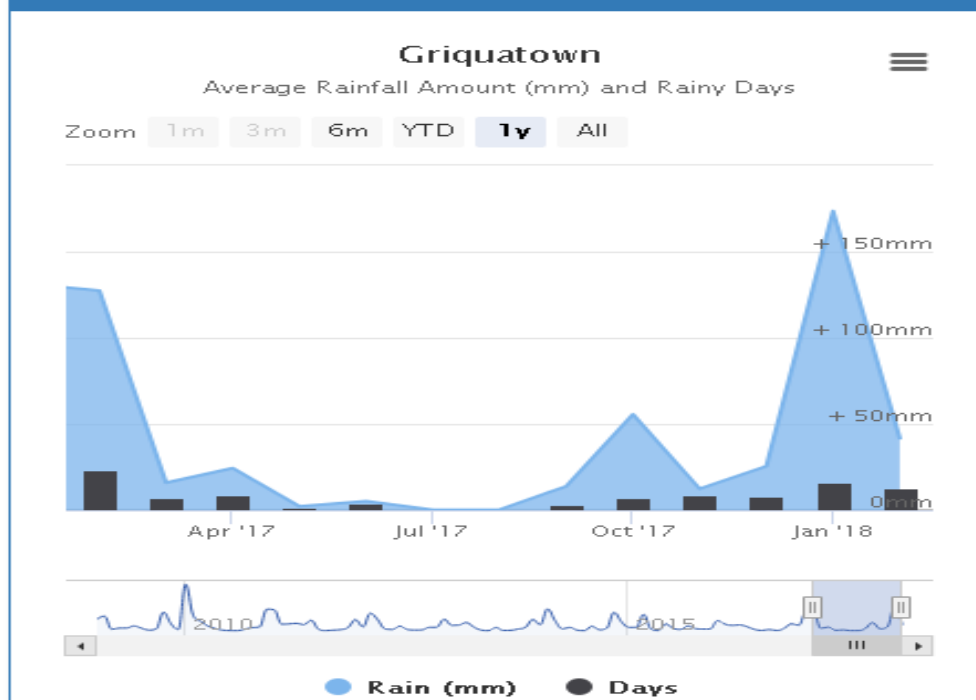
The study area is located within an area referred to as “low rainfall gravel plains” (Smith, 2000 and Van Wyk *et al.*, 2001 as cited by Mucina & Rutherford, 2006). Rainfall occurs mainly during the summer months, with an average rainfall of 250-500mm. The area is characterized by cold winters and hot summers with temperatures varying from between 8°C in winter and 42°C in summer, with an annual temperature of 20°C.

SOURCE:WORLDWEATHERONLINE(2017)

MAX, MIN AND AVERAGE TEMPERATURE



Rainfall and Rain Days

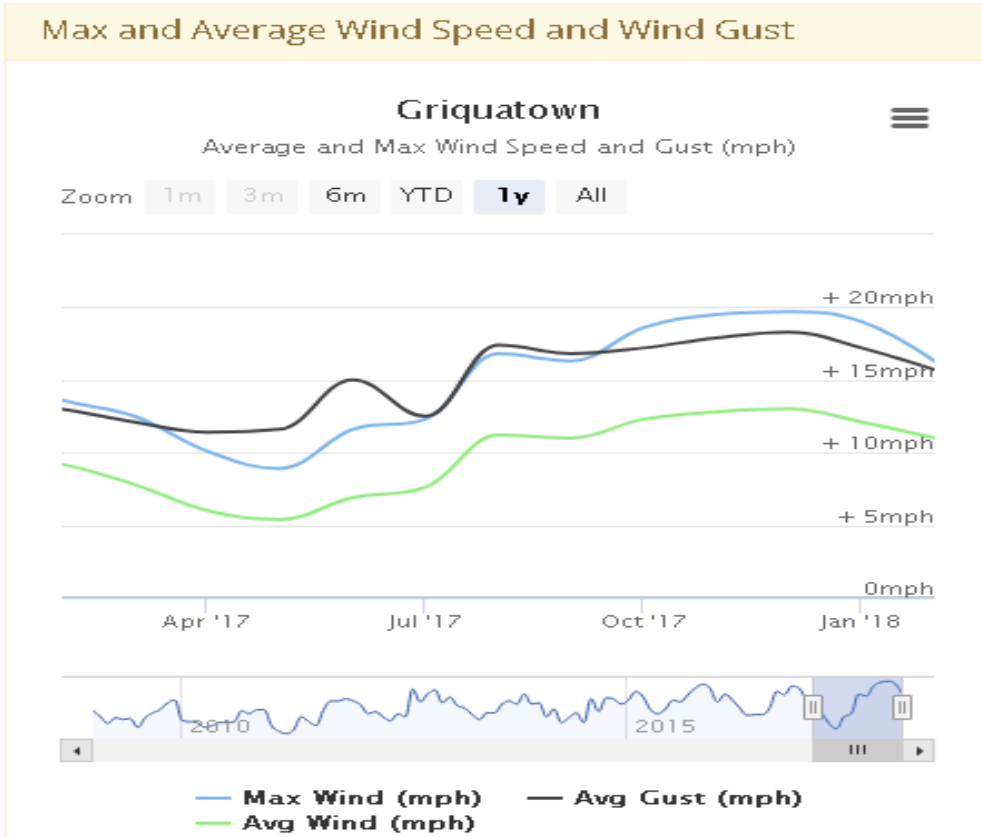


SNOWFALL

Snowfall and Snow Days



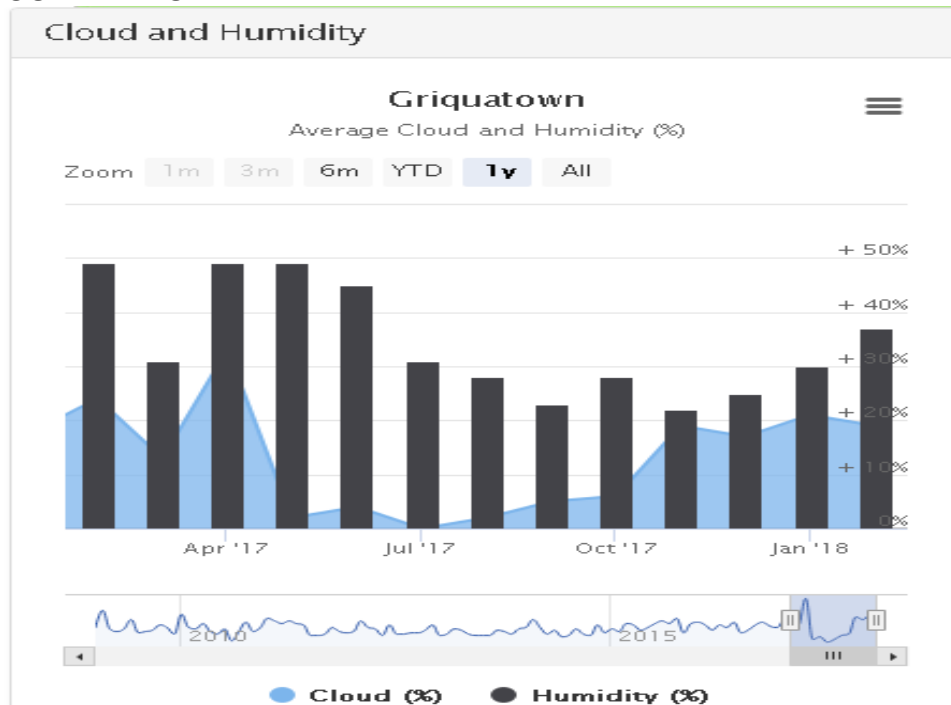
WIND



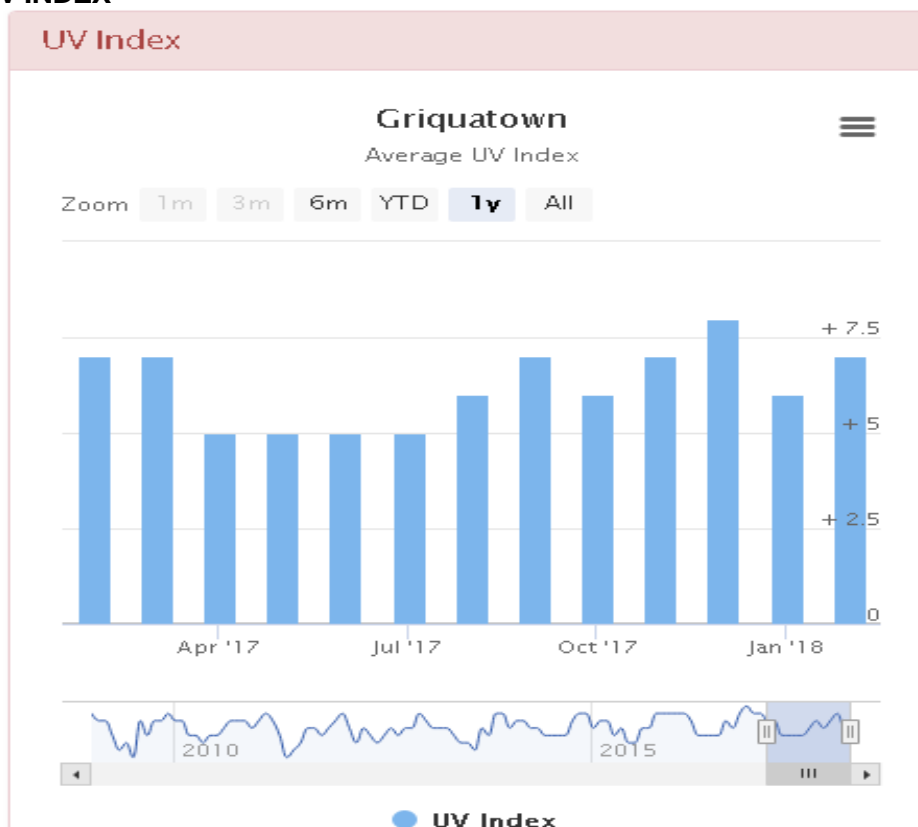
PRESSURE



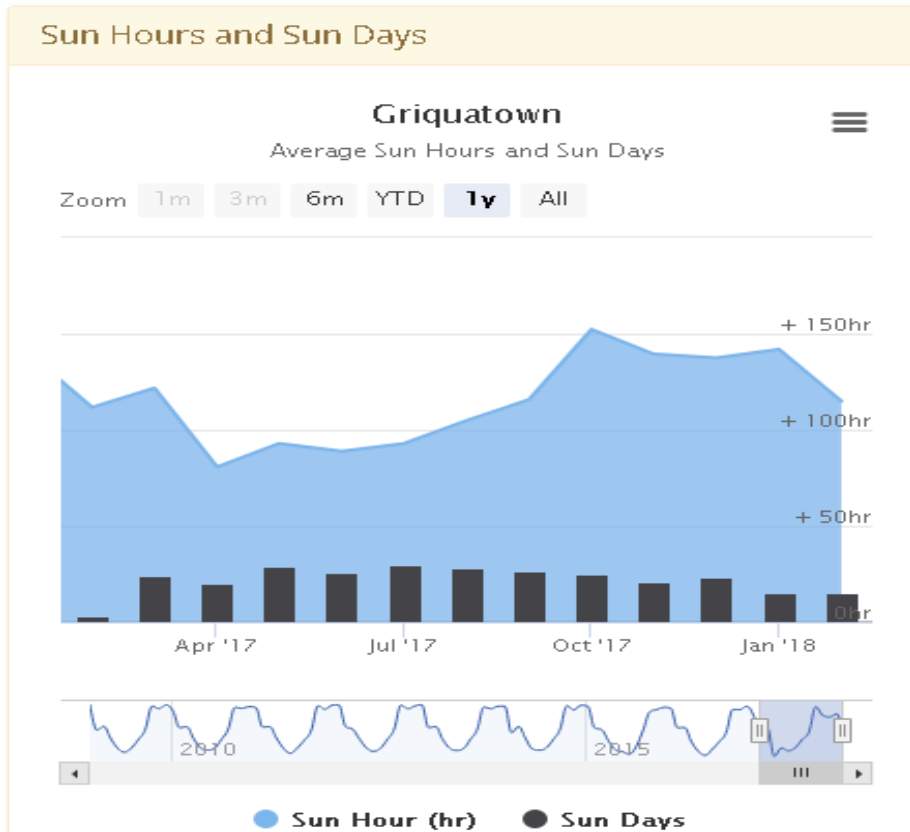
CLOUD AND HUMIDITY



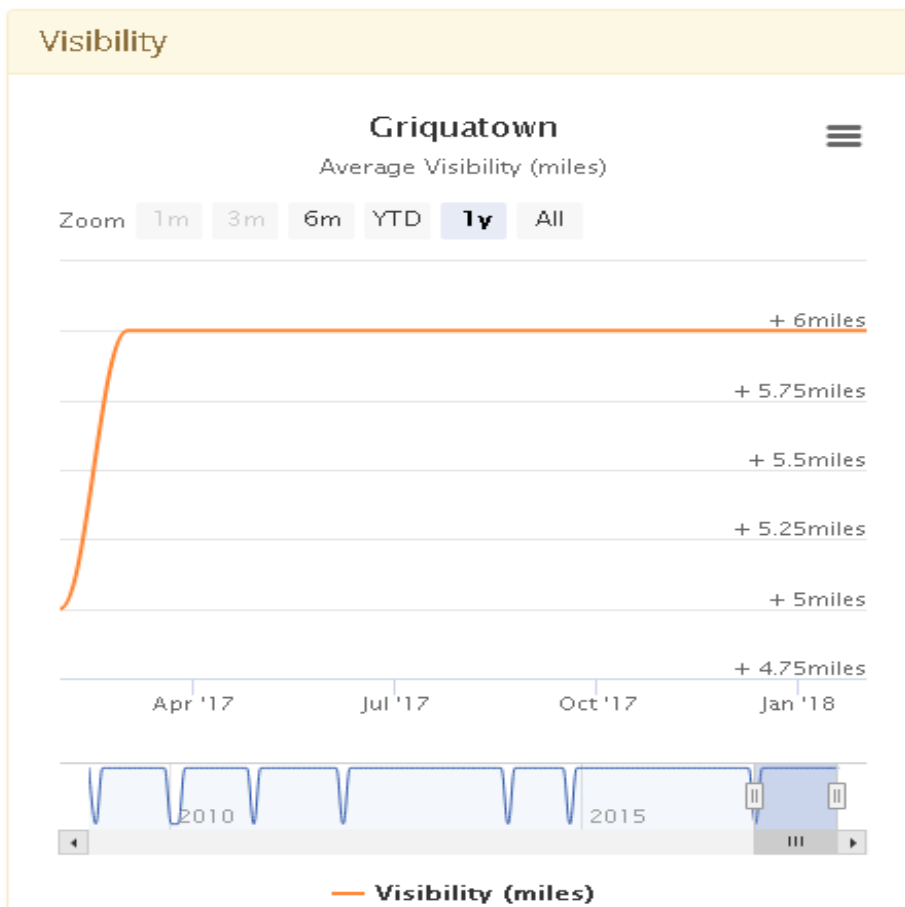
UV INDEX



SUN HOURS AND SUN DAYS



VISIBILITY



SOIL

Hutton form soils occur on the surrounding study area and consists of shallow sandy soils.



SOIL DEPTHS

As no access was gained to the study area, the depth of soils on the border fence was of average depth of approximately 300mm and 600mm deep.

NATURAL VEGETATION OCCURING ON THE STUDY AREA



Photo: From Fence Border Nek 106



Photo: From Fence Border Cairntoul

FLORA

The farms Cairntoul No. 189 and Nek No.106 are located within the Kuruman Mountain Bushveld Vegetation Type (Vegetation Type SVk No.10) of the Savanna Biome of South Africa (Smith 2000; Van Wyk *et al.*, 2001 as cited by Mucina & Rutherford, 2006).

The Kuruman Bushveld Vegetation type is characterised by an almost non-existent tree layer which consists mostly of scattered individuals of *Rhus lancea*. Individuals of *Acacia erioloba*, *Acacia haematoxylon* and *Boscia albitrunca* were, however recorded in the study area during a visit in February and March 2018. These were observed from outside the study perimeter as no access was gained. The shrub layer of this vegetation type is moderately developed with the following species being commonly found: *Diospyros austro-africana*, *Euclea crispa*, *E. undulata*, *Olea europaea* subspecies *Africana*, *Rhus pyroides*, *Rtridactyla*, *Tarchonanthus camphoratus*, *Tephrosia longipes*, *Rhus cillate*, *Amphoglossa triflora*, *Anthospermum rigidum*, *Compocarpus fruticosus*, *Helichrysum Zeyheri*, *Lantana rugose*, *Wahlenbergia nodosa*, *Ebracteola wilmaniae* and *Hertia palenis*. The climber *Rhynchosia totta* can also be found in the area.

The grass layer of this vegetation type is well developed, with the following graminoids occurring: *Andropogon chinensis*, *A.schirenses*, *Anthepora pubescens*, *Aristida congesta*, *Digitaria eriantha*, *Themea triandra*, *Triraphis andropogonoides*, *Aristide diffusa*, *Brachiaria nigropedata*, *Bulbostylis burchelli*, *Cymbopogon caesius*, *Diheteropogon amplectentes*, *Elionurus muticus*, *Eragrostis chloromelas*, *E. nindensis*, *Eustachys paspaloides*, *Heteropogon contortus*, *Melints repens*, *Schizachyrium sanguineum* and *Trichoneura grandiglumis*.

Herb species such as *Dicaoma anamola*, *D. schinzii*, *Geigeria ornativa*, *Helichrysum cerastiodes*, *Heliotropium strigosum*, *Hibiscus marlothianus*, *Kohautia cynanchica*, *Kyphocarpa angustifolia*, *Boophone disticha* and *Pellaea calomelanos* also occur in this vegetation type.

Two plant species listed above are protected, namely *Boophone disticha* and *Compocarpus fruticosus* and mitigating measures will be included in the EMPr.

Fauna

Mammals species that are known to occur in the study area are Aardvark *Orycteropus afer*, Bat-eared Fox *Otocyon megalotis*, Black-backed Jackal *Canis mesomelas*, Cape Hare *Lepus capensis*, *Caracal Caracal caracal*, Springbok *Antidorcas marsupialis*, Springhaas *Pedele capensis* and Steenbok *Raphicerus campestris* (Skinner & Smithers, 1990).

Of the mammal species listed above, the following are protected in the Northern Cape:

Aardvark *Orycteropus afer*, Bat-eared Fox *Otocyon megalotis*, Springbok *Antidorcas marsupialis* and Steenbok *Raphicerus campestris*.

The following of the above-listed animal species are included in the draft list of threatened and protected species issued in terms of section 56(1) of the National Environmental Management Biodiversity Act, 2004, as published in Government Notice No. 2706 of February 2005:

Black-backed Jackal *Canis mesomelas*, *Caracal Caracal caracal* and Springbok *Antidorcas marsupialis* (Schedule B1:Protected Species).

The following bird species are known to occur in the study area and classified as vulnerable according to the Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland (2000):

Martial Eagle *Polemaetus bellicosus*, Lesser Kestrel *Falco naumanni*, Kori Bustard *Ardeotis kori* and Ludwig's Bustard *Neotis ludwigii*. Other bird species known to occur in the area that are Lesotho and Swaziland (2003) include: Secretary Bird *Sagittarius serpentarius*, Peregrine Falcon *Falco peregrinus* and the Lanner Falcon *Falco biarmicus*.

Mitigation measures with regard to the protected mammal and bird species occurring in the study area will be included in the EMPR.

SURFACE WATER AND GROUNDWATER RESOURCES

SURFACE WATER STUDY AREA

The study area is located approximately 74km to the north of the Orange River, which is the closest source of perennial water to the study area. There is however a non-perennial drainage line running from the southwest to the southeast of the farm Cairntoul No.189 and southwards from the farm NEK No. 189. The main contributor to surface water is direct rainfall runoff that is both contaminated and uncontaminated.

GROUNDWATER

The bulk sampling program would not require process water. No application for a water-use authorization will be applied for from the Department Water and Sanitation.

Previous studies indicate that the water table in the area to be relatively shallow (~ 60m)

Ground Water Use

Agriculture, livestock farming and mining (Lime-Chem)

Ground Water Zone

Opencast alluvial mining does not ordinarily impact upon the regional ground water zone as excavations are shallow and do not require dewatering

Pans

The study area is characterised by non-perennial pans that occur on the boundary between the two farms.

RIVER DIVERSIONS

No river diversions are required for this project.

AIR QUALITY

The sources of airborne particulate matter include:

- Agricultural activities which result in wind-blown soil dust that occur from bare fields, especially in dry periods,
- Vehicles, unpaved roads and construction,
- Mining/ Prospecting including open pits,
- Domestic fuel burning,

- Industries including power plants and to lesser extent natural sources

PROSPECTING AREA

No site specific air quality data could be found to assess the air quality baseline conditions associated within the study area.

NOISE

The sources of the noise pollution during prospecting activities are:

- From the operation of earth moving equipment and other vehicles;
- Mineral processing and recovery;
- Generator noise.

The extent of this noise is mostly limited to the prospecting site.

VISUAL

The prospecting activities will be visible from the main road (R325) that connects Griekwastad and Postmasburg.

SITES OF HISTORICAL AND CULTURAL IMPORTANCE

HERITAGE

SAHRIS

Archaeological remains can be defined as human-made artefacts, which reflect past ways of life, deposited on or in the ground. All archaeological remains, artificial features and structures older than 100 years and historic structures older than 60 years are protected by the National Heritage Resources Act (NHRA) (Act No. 25 of 1999). No archaeological artefact, assemblage or settlement (site) may be moved or destroyed without the necessary approval from the South African Heritage Resources Agency (SAHRA).

The graveyards are protected under the South African Heritage Resources Act (Act no. 25 of 1999), and by the Human Tissues Act, 1983 (Act No. 65 of 1983). No disturbance to these sites is permitted.

It does not exempt HARDROCK EXPLORATION MN2 (PTY) LTD from obligation its obligation to suspend prospecting activity and immediately report to Provincial Authority and/or SAHRA, if some artefacts will be discovered during the prospecting operation

SOCIO-ECONOMIC STRUCTURE OF THE REGION SIYANCUMA LOCAL MUNICIPALITY MAP



GEOGRAPHY, HISTORY AND ECONOMY

Siyancuma Local Municipality is part of Pixley Ka Seme District Municipality.

MDB code: NC078

Description: The Siyancuma Local Municipality is situated within the Pixley Ka Seme District of the Northern Cape Province. It is bordered by the ZF Mgcawu and Frances Baard Districts in the north, Siyathemba and Thembelihle in the south, the Free State Province in the east, and the ZF Mgcawu District in the west.

It is one of the eight municipalities that make up the district, accounting for 16% of its geographical area.

Area: 16 753km²

Cities/Towns: Campbell, Douglas, Griekwastad, Riet River, Schmidtsdrif

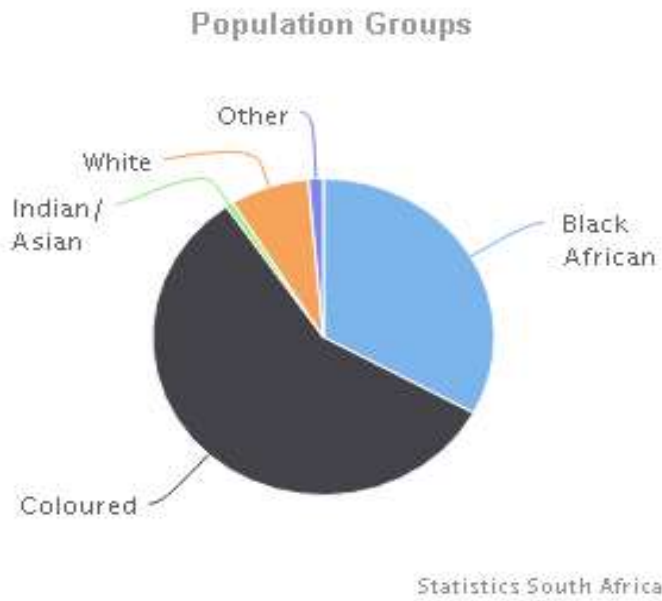
Main Economic Sectors: Agriculture, mining

According to the 2011 Census, Siyancuma Local Municipality has a total population of 37 076 people. The majority of the population in the municipality are Coloured at 57,5%, 33,3% are Black African, 7,5% are White, 0,7% are Indian/Asian, with the other population groups making up the remaining 1,4%.

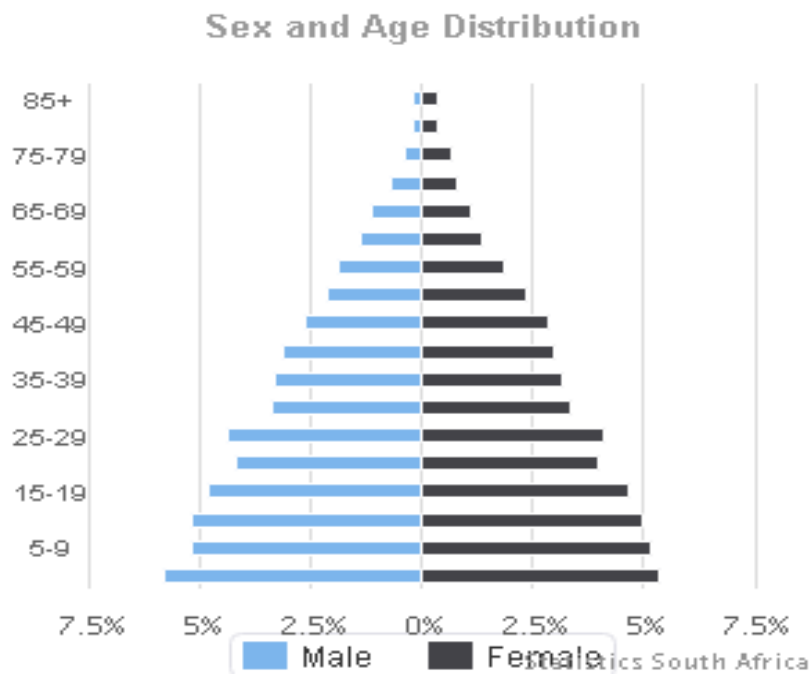
Of those aged 20 years and older, 7,2% have completed primary school, 30,3% have some secondary education, 16,9% have completed matric and 5,4% have some form of higher education. Of the mentioned age group, 16,8% have no form of schooling.

POPULATION GROUPS

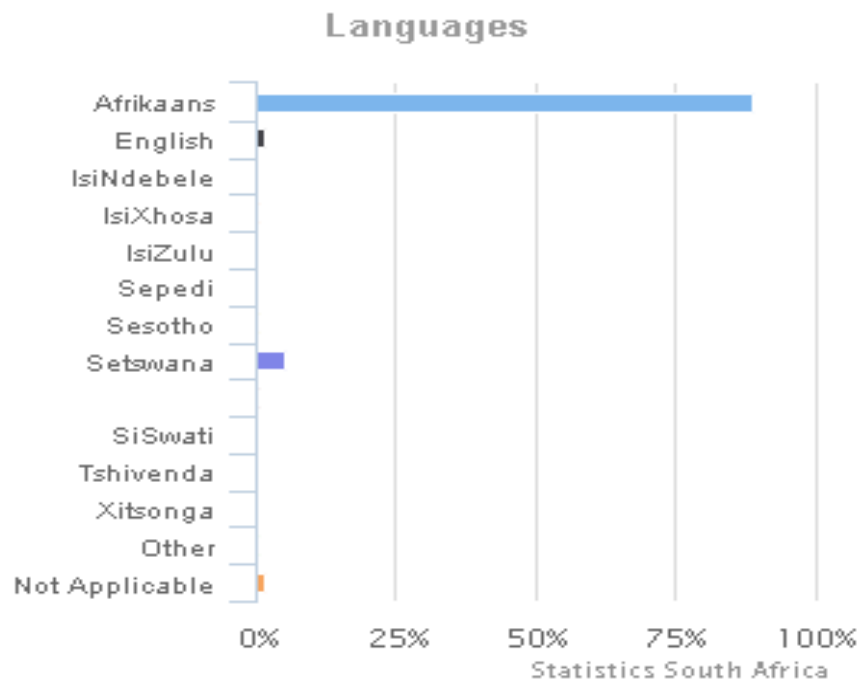
(SOURCE: STATS SOUTH - AFRICA)



SEX AND AGE DISTRIBUTION



LANGUAGES



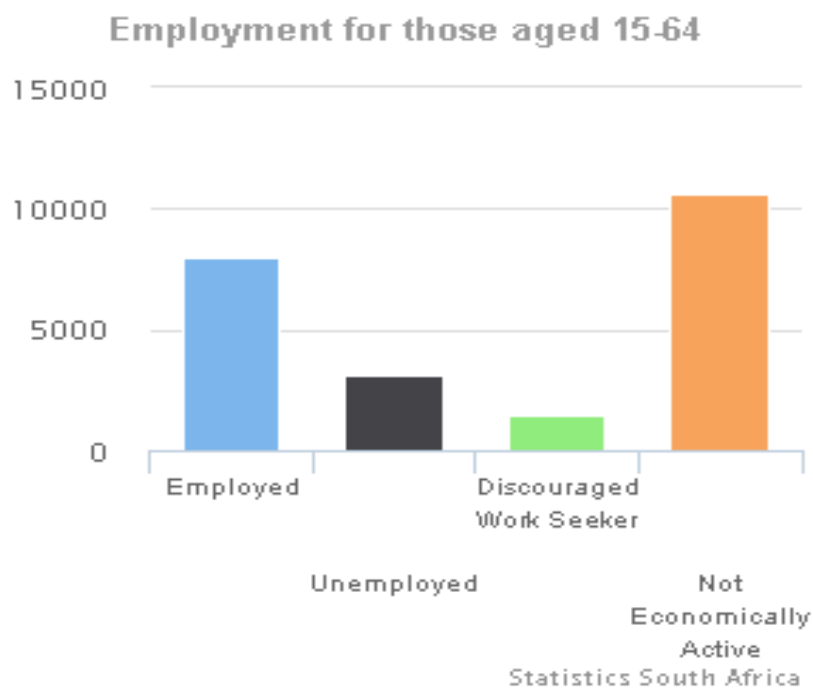
MARITAL STATUS



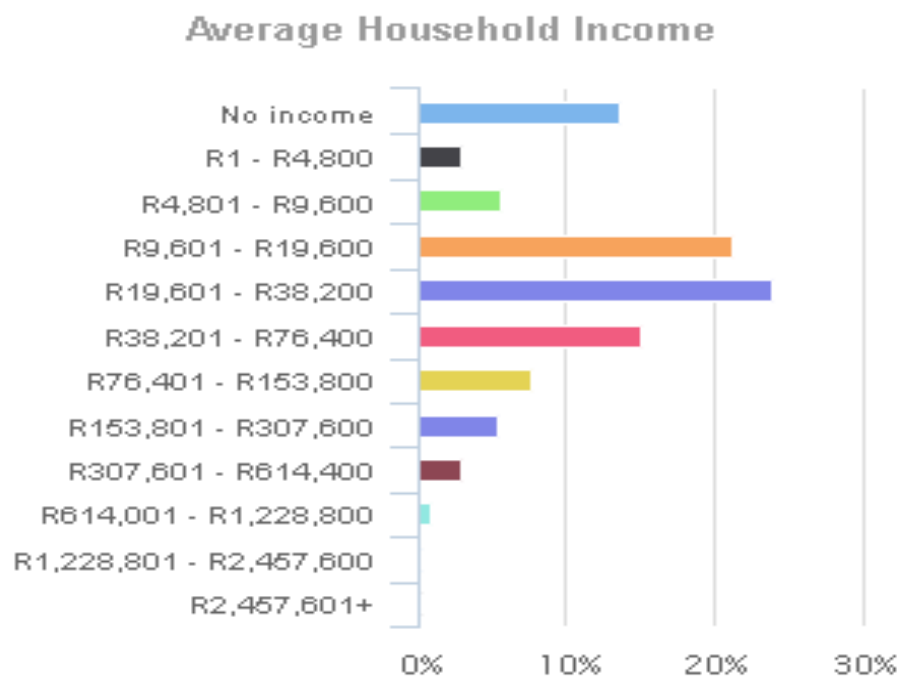
SEX



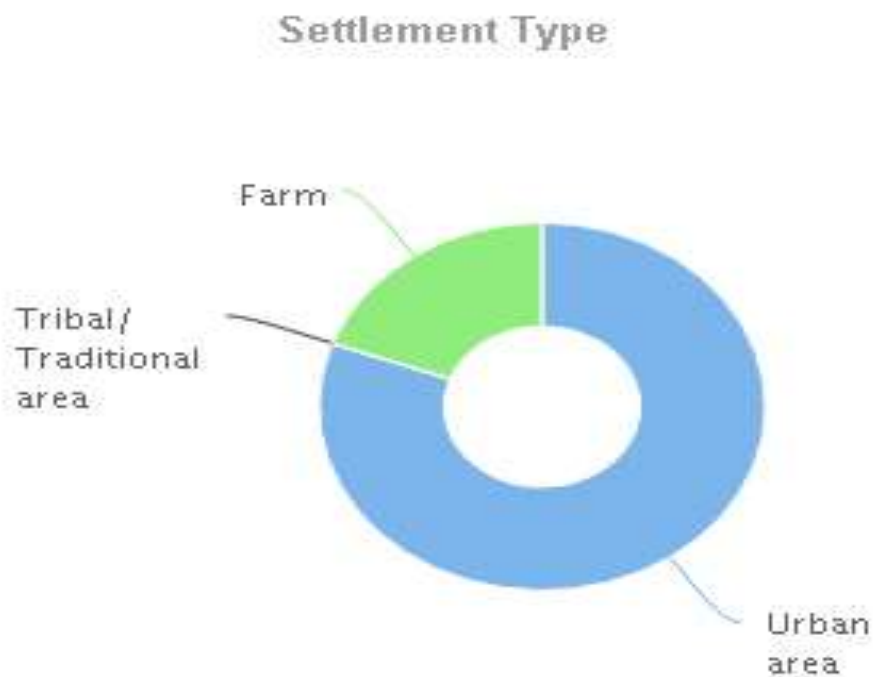
EMPLOYMENT AGED 15-64



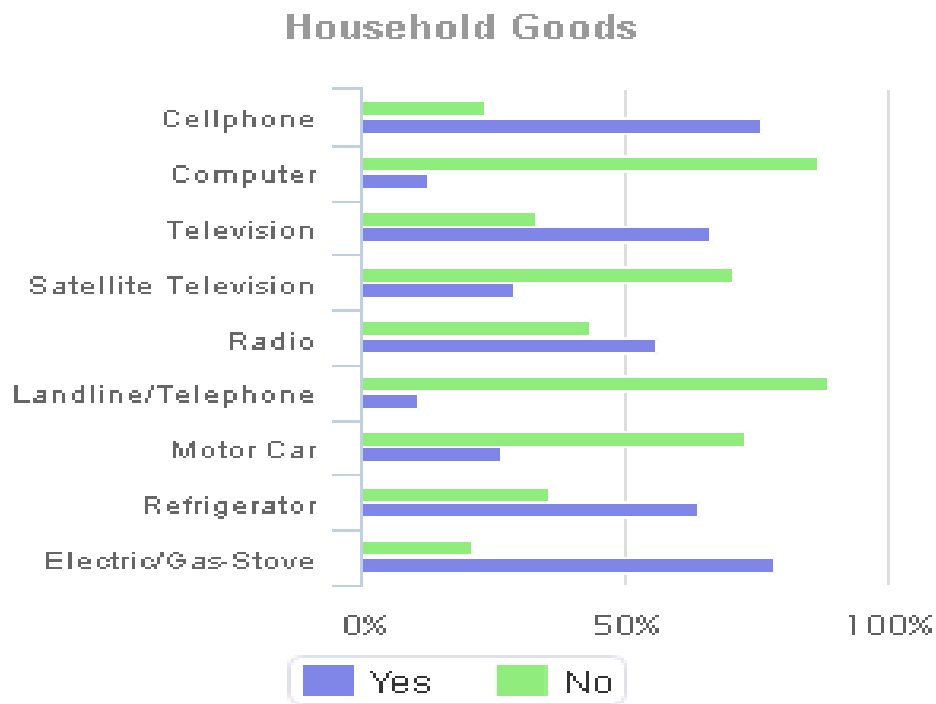
AVERAGE HOUSEHOLD INCOME



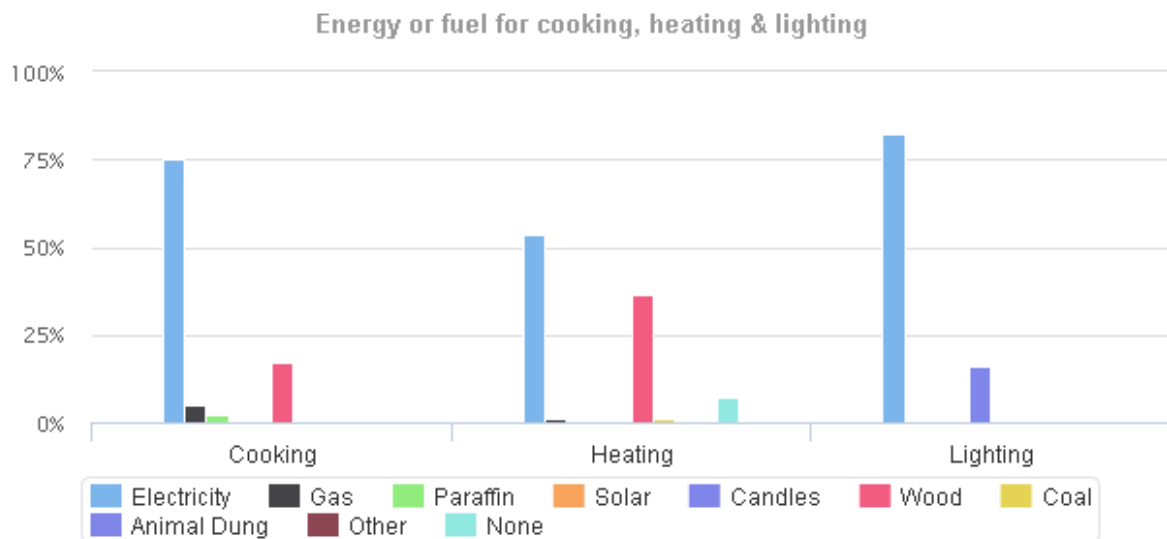
SETTLEMENT TYPE



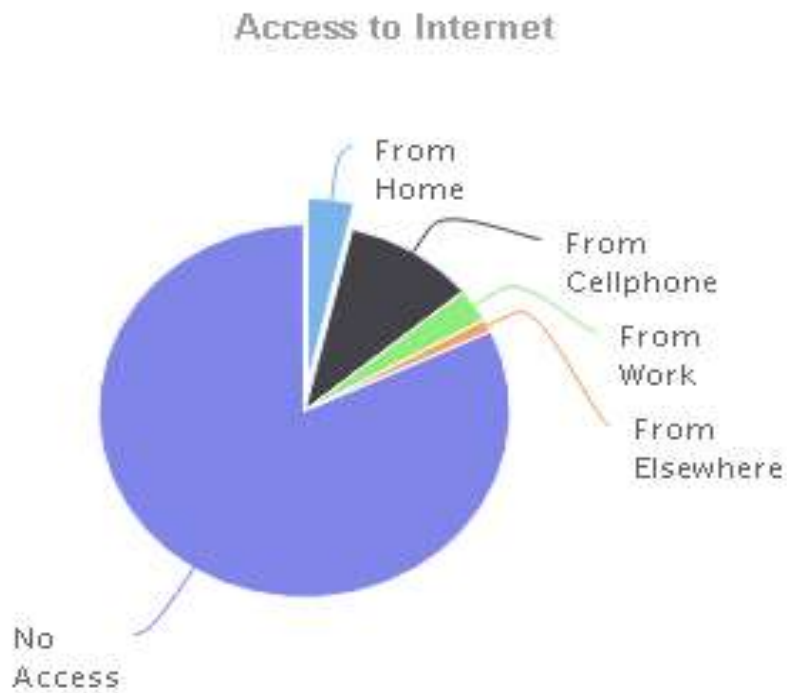
HOUSEHOLD GOODS



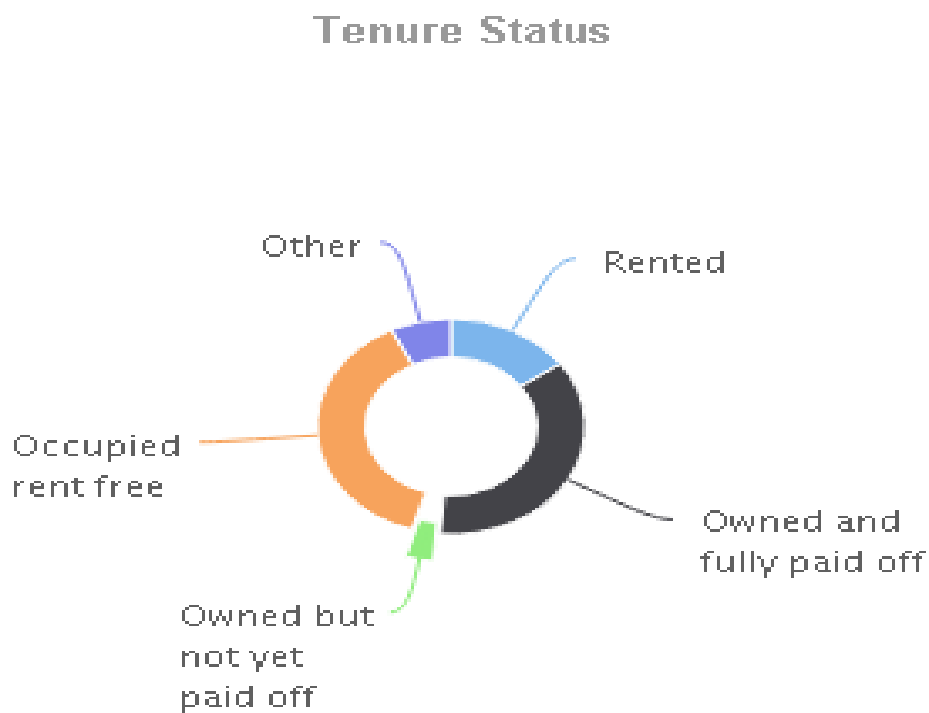
ENERGY OR FUEL FOR COOKING



ACCESS TO INTERNET

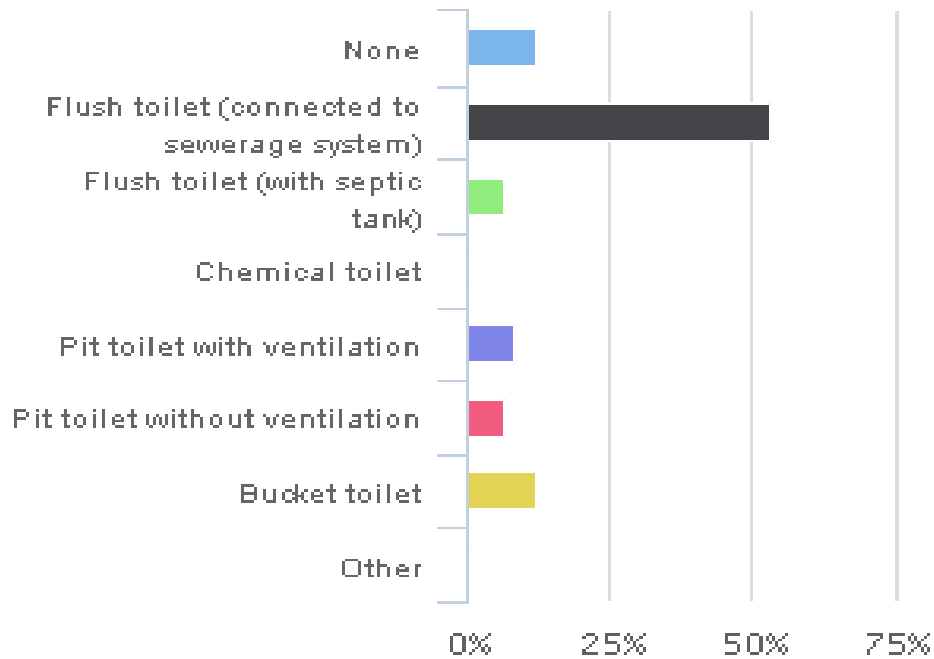


TENURE STATUS



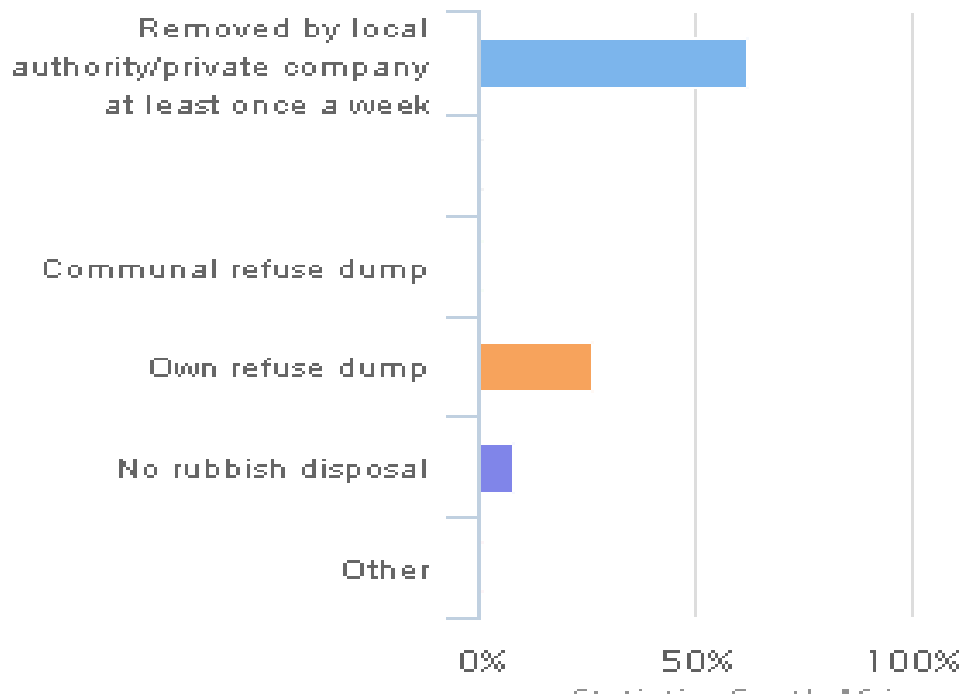
TOILET FACILITIES

Toilet Facilities



REFUSE DISPOSAL

Refuse Disposal



DEMOGRAPHIC INFORMATION

(SOURCE: MUNICIPALITIES OF SOUTH AFRICA 2016)

	2016	2011
Population	35 941	37 076
Age Structure		
Population under 15	26.2%	31.8%
Population 15 to 64	67.8%	62.2%
Population over 65	6.0%	6.0%
Dependency Ratio		
Per 100 (15-64)	47.5	60.8
Sex Ratio		
Males per 100 females	100.0	100.4
Population Growth		
Per annum	-0.71%	n/a
Labour Market		
Unemployment rate (official)	n/a	28.2%
Youth unemployment rate (official) 15-34	n/a	35.2%
Education (aged 20 +)		
No schooling	9.7%	16.7%
Matric	20.4%	16.8%
Higher education	8.9%	5.4%
Household Dynamics		
Households	10 191	9 578
Average household size	3.5	3.8
Female headed households	36.4%	35.7%
Formal dwellings	82.0%	73.0%
Housing owned	50.3%	39.6%
Household Services		
Flush toilet connected to sewerage	59.7%	53.4%
Weekly refuse removal	71.9%	62.3%
Piped water inside dwelling	41.5%	41.4%

	2016	2011
Electricity for lighting	89.1%	82.2%

SERVICE DELIVERY STATISTICS

	2015/16	2014/15	2013/14	2012/13	2011/12
Water					
Blue Drop Score	n/a	n/a	54.02	n/a	19.66
Is the municipality responsible to provide?	Yes	Yes	Yes	Yes	Yes
Does the municipality have infrastructure to provide?	Yes	Yes	Yes	Yes	Yes
Does the municipality actually provide?	Yes	Yes	Yes	Yes	Yes
Is the service outsourced/commercialised?	No	No	No	No	No
Number of households and non-domestic customers to which provided	6 519	6 519	6 517	6 351	6 200
Number of domestic households/delivery points	6 280	6 280	6 280	6 151	6 000
Inside the yard	6 280	6 280	6 280	6 151	6 000
Less than 200m from yard	0	0	0	0	0
More than 200m from yard	0	0	0	0	0
Domestic households with access to free basic service	2 787	2 787	2 584	2 910	2 694

	2015/16	2014/15	2013/14	2012/13	2011/12
Electricity					
Is the municipality responsible to provide?	Yes	Yes	Yes	Yes	Yes
Does the municipality have infrastructure to provide?	Yes	Yes	Yes	Yes	Yes
Does the municipality actually provide?	Yes	Yes	Yes	Yes	Yes
Is the service outsourced/commercialised?	Yes	Yes	Yes	Yes	Yes
Number of households and non-domestic customers to which provided	5 916	5 916	5 916	5 307	7 639
Domestic households with access to free basic service	2 745	2 745	2 625	1 832	2 694
Sewerage and Sanitation					
Green Drop Score	n/a	n/a	n/a	n/a	0
Is the municipality responsible to provide?	Yes	Yes	Yes	Yes	Yes
Does the municipality have infrastructure to provide?	Yes	Yes	Yes	Yes	Yes
Does the municipality actually provide?	Yes	Yes	Yes	Yes	Yes
Is the service outsourced/commercialised?	No	No	No	No	No

	2015/16	2014/15	2013/14	2012/13	2011/12
Number of households and non-domestic customers to which provided	6 734	6 734	6 253	6 081	6 370
Number of households using:					
Flush toilet - public sewerage	3 187	3 187	3 141	3 141	2 992
Flush toilet - septic tank	123	123	126	126	564
Ventilated pit latrine	572	572	572	572	572
Bucket system	2 238	2 238	2 226	2 115	2 115
Other	0	0	0	0	0
Domestic households with access to free basic service	2 787	2 787	2 584	2 710	2 694
Solid Waste Services					
Is the municipality responsible to provide?	Yes	Yes	Yes	Yes	Yes
Does the municipality have infrastructure to provide?	Yes	Yes	Yes	Yes	Yes
Does the municipality actually provide?	Yes	Yes	Yes	Yes	Yes
Is the service outsourced/commercialised?	No	No	No	No	No
Number of households and non-domestic customers to which provided	6 199	6 199	6 111	6 084	5 960

	2015/16	2014/15	2013/14	2012/13	2011/12
Domestic households with access to free basic service	2 787	2 787	2 584	2 710	2

Heritage, Cultural-historical or Archaeological Interest

7/3/2018

PalaeoSensitivity Map | SAHRA

Log in/Register

SAHRIS

Explore Calendar Maps Help

PalaeoSensitivity Map

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

MARK Back to Top

South African Heritage Resources Agency (SAHRA)
 Head Office
 111 Harrington Street
 CAPE TOWN
 8001

PO Box 4637
 Cape Town, 8000
 Tel 021 462 4502/Fax 021 462 4509
 Email info@sahra.org.za
 Web www.sahra.org.za (<http://www.sahra.org.za/>)

An agency of the Department of Arts & Culture

Powered by Drupal (<http://drupal.org/>)

© 2018 SAHRA. All rights reserved.
 Disclaimer (<http://www.sahra.org.za/about/disclaimer/>)

SA/2.5/2.1

The SAHRIS Map require a desktop study to be conducted which will be commissioned through the Mc Gregor Museum

CURRENT PROTECTION STATUS:

Structures older than 60 years fall under the protection of Section 34(1) of the National Heritage Resources Act 25 of 1999. Additionally, in terms of Section 35(4) of the National Heritage Resources Act (25 of 1999), man-made features and artefacts older than 100 years are defined as being archaeological. In the same section, the act also states that such archaeological sites and objects may not be disturbed, altered, modified or destroyed without a suitable permit.

Graves and burial grounds fall under various legislative protections. Such legislation may include the National Heritage Resources Act 25 of 1999, the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the Human Tissue Act 65 of 1983, the Ordinance on Excavations (Ordinance no. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place.

Archaeological remains can be defined as human-made artefacts, which reflect past ways of life, deposited on or in the ground. All archaeological remains, artificial features and structures older than 100 years and historic structures older than 60 years are protected by the National Heritage Resources Act (NHRA) (Act No. 25 of 1999). No archaeological artefact, assemblage or settlement (site) may be moved or destroyed without the necessary approval from the South African Heritage Resources Agency (SAHRA).

The graveyards are protected under the South African Heritage Resources Act (Act no. 25 of 1999), and by the Human Tissues Act, 1983 (Act No. 65 of 1983). No disturbance to these sites is permitted. If it is inevitable that mining will have an impact on this site, mitigation measures (i.e. exhumation and reburial) will have to be proposed as part of a Phase 2 investigation.

SAHRA/SAHRIS

The SAHRIS Map require a desktop study to be conducted which will be commissioned through the Mc Gregor Museum

It does not exempt HARD ROCK MN2 from its obligation to suspend prospecting activity and immediately report to SAHRA, if some artefacts will be discovered during the prospecting operation

DESCRIPTION OF CURRENT LAND USES

LAND USE

The farms are currently used for livestock and game farming.

AGRICULTURE

The study area could be used for numerous agricultural produce which is currently not practiced.

a. **Description of specific environmental features and infrastructure on the site.** No specific environmental features have been notified of.

b. **Environmental and current land use map.**
(Show all environmental and current land use features)



The land are currently used for game and livestock farming.

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

Table 1 Impacts Identified

Prospecting Activity	Impact On	Duration	Probability	Significance	Extent
Roads and Hauling	Air Quality	Medium	Moderate	Moderate	Local-Minimised through Dust control measures
	Fauna	Long	Definite	High	Site Specific-Reversed with rehabilitation
	Flora	Long	Definite	High	Site Specific-Reversed with rehabilitation
	Noise	Short	Definite	Low	Local-Managed through Maintenance program of TMM's
	Visual	Long	Probable	No significance	Local-Reversed with rehabilitation
	Soil	Long	Definite	High	Site specific-Reversed with rehabilitation
Excavations	Air Quality	Short	Definite	Low	Site Specific-Minimised through Dust control measures
	Fauna	Long	Definite	High	Site Specific-Reversed with rehabilitation
	Flora	Long	Definite	High	Site Specific-Reversed with rehabilitation
	Noise	Short	Moderate	Medium	Local-Managed through Maintenance program of TMM's
	Soil	Long	Definite	High	Reversed with rehabilitation
	Topography	Long	Very High	Low	Site Specific-Irreplaceable loss
	Visual	Medium	Very High	No significance	Local-Reversed with rehabilitation
	Archaeological	Permanent	Very Low	Very High	Global-Awareness program
	Land Use	Medium	Low	Moderate	Site Specific-within EA area
	Sensitive Landscapes	Very short	Very low	Very High	Avoid –None present on site
	Land	Very	Low	High	Site specific

	Capability	Short			
Waste Dump	Air Quality	Short	Low	Medium	Site Specific-Managed through Dust control measures
	Fauna	Medium	Definite	High	Site Specific-Reversed with rehabilitation
	Flora	Medium	Definite	High	Site Specific-Reversed with rehabilitation
	Soil	Medium	Low	High	Site Specific-Reversed with rehabilitation
	Topography	Medium	Definite	Low	Site Specific-Irreplaceable loss Used for backfill purposes to some extent
	Visual	Medium	Definite	High	Site Specific-Mitigated to some when rehabilitated
	Surface Water	Medium	Low	Low	Site Specific-Mitigated to some extent with water barriers
	Ground water	Very Short	Low	Low	Local-Mitigated to some extent with water barriers
Topsoil Storage	Air Quality	Very Short	Moderate	High	Site Specific-Managed through Dust control measures
	Fauna	Long	Definite	High	Site Specific-Reversed with rehabilitation
	Flora	Long	Definite	High	Site Specific-Reversed with rehabilitation
	Noise	Short	Definite	Medium	Site Specific-Reversed with rehabilitation
	Soil	Medium	Definite	High	Site Specific-Irreplaceable loss Used for backfill purposes to some extent
	Topography	Long	Definite	Low	Site Specific-Mitigated to some when rehabilitated
	Visual	Long	Definite	No significance	Site Specific-Mitigated to some when rehabilitated
Plant and Processing areas	Air Quality	Short	Definite	Medium	Site Specific-Managed through Dust control measures
	Fauna	Long	Definite	High	Site Specific-Reversed with rehabilitation
	Flora	Long	Definite	High	Site Specific-Reversed with rehabilitation
	Noise	Short	Definite	Medium	Site Specific-Reversed with rehabilitation

	Soil	Long	Definite	High	Site Specific-Irreplaceable loss
	Surface water	Long	Definite	Low	Site Specific-Mitigated to some extent with water barricade
	Visual	Long	Definite	No significance	Site Specific-Mitigated to some when rehabilitated
Office, Ablution facilities, & other temporary buildings	Air Quality	Very Short	Very Low	No Significance	Site Specific-Managed through Dust control measures
	Fauna	Long	Definite	Site Specific-Managed through Dust control measures	Site Specific-Reversed with rehabilitation
	Flora	Long	Definite	Site Specific-Reversed with rehabilitation	Site Specific-Reversed with rehabilitation
	Noise	Short	Definite	Site Specific-Reversed with rehabilitation	Site Specific-Reversed with rehabilitation
	Soil	Long	Definite	Site Specific-Reversed with rehabilitation	Site Specific-Irreplaceable loss Used for backfill purposes to some extent
	Visual	Long	Definite	No significance	Site Specific-Mitigated to some when rehabilitated
Workshops and Diesel Tanks	Air Quality	Very Short	Very Low	No Significance	Site Specific-Managed through Dust control measures
	Fauna	Long	Definite	Site Specific-Managed through Dust control measures	Site Specific-Reversed with rehabilitation
	Flora	Long	Definite	Site Specific-Reversed with rehabilitation	Site Specific-Reversed with rehabilitation
	Noise	Short	Definite	Site Specific-Reversed with rehabilitation	Site Specific-Reversed with rehabilitation
	Soil	Long	Definite	Site Specific-Reversed with rehabilitation	Site Specific-Irreplaceable loss Used for backfill purposes to some extent
	Visual	Long	Definite	No significance	Site Specific-Mitigated to some when rehabilitated
	Groundwater	Long	Moderate	Low	Site Specific-Mitigated with drip trays/oils/solvents/domestic and industrial waste

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

The different environmental components on which the project can/may have an impact are:-

- a) Geology
- b) Topography
- c) Soil
- d) Land Capability
- e) Land Use
- f) Vegetation (Flora)
- g) Wild Life (Fauna)
- h) Surface Water
- i) Ground Water
- j) Air Quality
- k) Noise
- l) Archaeological and Cultural Sites
- m) Sensitive Landscapes
- n) Visual Aspects
- o) Socio-economic Structure
- p) Interested and Affected Parties

1) Impact Assessment

Before the impact assessment could be done the different project activities were identified.

2) Activities

- a) Roads and hauling
- b) Drilling
- c) Trenching
- d) Temporary waste dump area and topsoil storage area
- e) Plant and Processing area
- f) Temporary office, workshops, ablution facilities, water tanks, diesel tanks and other temporary buildings

3) Environmental Impact Assessment Summary

Table 2-Environmental Impact Summary

ENVIRONMENTAL ASPECTS	AFFECTED	AFFECTED	NOT AFFECTED
	NEGLIGABLE	SUBSTANTIAL	
GEOLOGY	x		
TOPOGRAPHY	x		
SOIL		x	
LAND CAPABILITY	x		
LAND USE	x		
VEGETATION		x	
WILDLIFE	x		
SURFACE WATER	x		
GROUND WATER			x
AIR QUALITY		x	
NOISE		x	

SENSITIVE LANDSCAPES			x
VISUAL ASPECTS		x	
SOCIO ECONOMICS (POSITIVE)	x		
INTERESTED AND AFFECTED PARTIES	x		
ARCHAEOLOGICAL			x

4) Environment likely to be affected by the alternative land use.

Prospecting will not be new to the area as the Lime-Chem Resources operation has been operational before.

Before any assessment can be made the following evaluation criteria need to be described:

Table 3-Explanation of probability of impact occurrence

Probability of impact occurrence	Explanation of probability
Very Low	<20% sure of particular fact or likelihood of impact occurring
Low	20-39% sure of particular fact or likelihood of impact occurring
Moderate	40-59% sure of particular fact or likelihood of impact occurring
High	80-79% sure of particular fact or likelihood of impact occurring
Very High	80-99% sure of particular fact or likelihood of impact occurring
Definite	100% sure of particular fact or likelihood of impact occurring

Table 4-Explanation of extend of impact

Extent of Impact	Explanation of extent
Site specific	Direct and indirect impacts limited to site of impact only
Local	Direct and indirect impacts affecting environmental elements within the study area
Regional	Direct and indirect impacts affecting environmental elements within the Free State
National	Direct and indirect impacts affecting environmental element on national level
Global	Direct and indirect impact affecting environmental elements on global level

Table 5-Explanation of duration of impact

Duration of impact	Explanation of duration
Very short	Less than 1 year
Short	1 to 5 years
Medium	6 to 12 years
Long	13 to 50 years
Very long	Longer than 50 years
Permanent	Permanent

Table 6-Explanation of impact significance

Impact significance	Explanation of significance
No impact	There will be no impact at all not even a very low impact on the system or any of

	its parts
Very low	Impact will be negligible. In the cast of negative impact, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple. In the case of positive impacts alternative means would almost all likely be better, if one or a number of ways, then this means of achieving benefit
Low	Impact would be of low order and with little real effect. In the case of negative impacts, mitigation and /or remedial activity would be either easily achieved or little would be required or both. In the case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time consuming, or some combination of these
Moderate significance	Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and /or remedial activity would be feasible and fairly easily possible. In the case of positive impacts other means of covering these benefits would be about equal in cost and effort
High significance	Impacts of substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these. In the case of positive impact other means of achieving this benefit would be feasible but would be more difficult, expensive, time consuming or some combination of these
Very high significance	Of the highest order possible within the bounds of impact which could occur, in the case of negative impacts, there would be no possible mitigation and /or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impact there is no real alternative to achieving the benefit

Table 7 -Impacts – Aspect Geology

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Geology-Competent rock formations deposits will be destroyed during the prospecting operation. Waste rock material/ overburden material is disposed of/backfilled in existing excavations as part of the prospecting process	
Extent	Site	Activity causing the impact
Duration	Permanent	An open cast bulk sampling will be used to extract diamonds. Therefore the original geology will be totally destroyed in certain areas.
Probability	Definite	
Significance	Low	

Table 8-Impacts – Aspect Topography

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	<ul style="list-style-type: none"> • Change in landform • Disturbance of the surface <p>The bulk sampling programme of the kimberlitic deposits will result in the creation of excavations that act as depressions in the environment that captures run-off. Normal surface drainage will be disturbed on a given point. Run-off if any will be diverted away from the specific site</p>	
Extent	Site	Activity causing the impact
Duration	Very long to permanent	Bulk sampling through excavations
Probability	Definite	
Significance	High	

Table 9-Impacts – Aspect Soil

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	The surface area is characterised by various soil depths. Any	

	construction of infrastructure should be preceded by the removal of all available topsoil	
Extent	Site	Activity causing the impact
Duration	Long	In the process of removing topsoil the soil layers are mixed and the structure may be disturbed
Probability	High	
Significance	Moderate	

Table 10-Impacts – Aspect Soil

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	The establishment, construction, operation and eventually rehabilitation (demolition) of listed structures such as the access roads, stockpiles. Tailings dumps, cause compaction of soil. All prospecting activities will be concentrated on the targeted area where alluvial deposits could be found. In the same time a certain surface area is therefore alienated. The active prospecting surface are (alienated) would be restricted within the minimum area required for prospecting purposes	
Extent	Site	Activity causing the impact
Duration	Very short	When removing topsoil during site preparation, the storm water control structures are in place. If a severe storm hits the area, it may lead to erosion on site. Topsoil stockpiles may be prone to erosion due to lack of vegetation cover water control structures may fail or severe rainstorms may cause excess run-off. Surface compaction due to activities taking place
Probability	Very low	
Significance	Low	

Table 11-Impacts – Aspect Soil

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Potential of soil contamination	
Extent	Site	Activity causing the impact
Duration	Long	Vehicle/ equipment breakages and oil/ lubricant, diesel spills may contaminate soil
Probability	Moderate	
Significance	Moderate	

Table 12-Impacts-Aspect Soil

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Loss of soil structure	
Extent	Site	Activity causing the impact
Duration	Long	In the process of removing topsoil the soil layers are mixed and the structure may be disturbed
Probability	High	
Significance	Moderate	

Table 13-Impacts – Aspect Soil

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Loss of soil fertility	
Extent	Site	Activity causing the impact
Duration	Short	The mixing of the soil during site preparation compaction and potential pollution (spillages from oil etc.) all may cause loss of soil fertility
Probability	Definite	
Significance	Low	

Table 14-Impacts – Aspect Land Use

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Temporary loss of land use for residential or commercial use until mining is completed.	
Extent	Site	Activity causing the impact
Duration	Short	Bulk sampling and prospecting infrastructure.
Probability	Low	
Significance	Low	

Table15-Impacts – Aspect Vegetation

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Vegetation clearance and disturbance. Due to	

	disturbed ecosystem, bare ground and spreading of exotics can follow.	
Extent	Site	Activity causing the impact
Duration	Permanent	Bulk sampling Programme.
Probability	Definite	
Significance	High	

Table 16-Impacts – Aspect Vegetation

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Habitat change, loss of species, spread of alien invasive species	
Extent	Site	Activity causing the impact
Duration	Permanent	The change in the habitat would be mitigated during final rehabilitation
Probability	High	
Significance	Moderate	

Table 17-Impacts – Aspect Vegetation

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Dust covering of plants	None
Extent	Site	Activity causing the impact
Duration	Long	Heavy trucks and other vehicles as well as the dumping of tailings.
Probability	High	
Significance	Low	

Table 18-Impacts – Aspect Fauna

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Wildlife habitat destruction, /disturbance change	
Extent	Site	Activity causing the impact
Duration	Permanent	The flora which normally serves as habitat for animals would be destroyed. The animals would be scared of the increase in activity. The area will serve as habitat after rehabilitation.
Probability	Very High	
Significance	Moderate	

Table 19-Impacts – Aspect Wildlife

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Injury or death to wildlife	None

Extent	Site	Activity causing the impact
Duration	Short	The movement of vehicles might kill certain insets, rodents, and possible birds. Most of the remaining animal life will move away due to the dust and noise.
Probability	Low	
Significance	Low	

Table 20-Impacts – Aspect Surface Water

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Increased silt load. Clearing topsoil for footprint areas can increase infiltration rates of water to the groundwater system and decrease buffering capacity of soils to absorb contamination from soils to surface. This can increase the risk of contamination of the groundwater system.	
Extent	Local	Activity causing the impact
Duration	Short	The clearance of vegetation and the traffic on access roads will all contribute to an increase in the silt load on the prospecting area.
Probability	Moderate	
Significance	Moderate	

Table 21-Impacts – Aspect Surface Water

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Change in surface water quality. Spillages from vehicles and also surface water run-off could end-up in excavations creating problems with the water quality.	
Extent	Local	Activity causing the impact
Duration	Short	Dirty/clean water systems at facilities like the overburden dumps, roads, trenches, may impact on the quality of the surface water.
Probability	Moderate	
Significance	High	

Table 22-Impacts – Aspect Ground Water

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Reduction in ground water quality. This prospecting process does not make use of any chemicals that may impact on the groundwater system. Handling of waste can cause various types of spills (domestic waste, french hydrocarbons) which can infiltrate and contaminate the groundwater system.	
Extent	Site	Activity causing the impact
Duration	Long	
Probability	Definite	
Significance	High	

Table 23-Impacts – Aspect Air Quality

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Dust will be created during the trenching, transport of material and processing plant stage. The site is remote from any residential area and will have no negative impacts. Impact would be more direct to worker environment and the requirements of the Mine Health and Safety requirements observed.	
Extent	Site	Activity causing the impact
Duration	Long	Bulk sampling by means of excavations, TMM's on the roadways and transfer points in the plant.
Probability	Moderate	
Significance	Moderate	

Table 24-Impacts – Aspect Noise Pollution

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Noise will be generated during the loading and hauling process, also the processing plant with the scrubbers, pans and screens. Impact will be concentrated in the	

	worker environment.	
Extent	Local	Activity causing the impact
Duration	Long	Earth moving equipment and plant
Probability	Definite	
Significance	Moderate	

Table 25-Impacts – Aspect Archaeological and Cultural Sites

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	The terrain is not archaeologically sensitive	
Extent	Site	Activity causing the impact
Duration	Permanent	Prospecting Activity
Probability	Low	
Significance	Low	

Table 26-Impacts – Aspect Sensitive Landscape

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	No sensitive landscape identified	
Extent	Not applicable	Activity causing the impact
Duration	Not applicable	
Probability	Not applicable	
Significance	Not applicable	

Table 27-Impacts – Aspect Socio Economic

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Increase in socio-economic activity at local level.	Will add to the increase in socio-economic activity for Griekwastad.
Extent	Local	Activity causing the impact
Duration	Long	Additional employment opportunity created.
Probability	Definite	
Significance	High	

Table 28-Impacts – Aspect Interested and affected Parties

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	No negative impacts are foreseen.	
Extent	Local	Activity causing the impact
Duration	Long	
Probability	High	
Significance	High	

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

Positive Impacts

There will be job opportunities created for the local community.

Advancement of women in the mining industry. The applicant undertook to employ at least 30% women in the prospecting project.

BEE companies in Griekwastad supported through purchase of consumables.

Revenue to state through royalties that must be paid through the sale of diamonds.

Health and Safety programs by the operation will have a positive effect on the community at large.

Negative Impacts

Increase noise and air pollution

Possible disturbance to drainage patterns during project.

Destruction of fauna and flora.

The negative impacts in terms of noise and air pollution and destruction to fauna and is limited to the duration of the project. Mitigation measures will be implemented to minimise those impacts. See discussion under (viii) below.

viii) The possible mitigation measures that could be applied and the level of risk.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

No concerns have been raised by Interested and Affected parties but the following general concerns have been discussed:

1.1 Noise:

Mitigation measures

As a minimum, ambient noise levels emanating from the prospecting area will not exceed

82dB (A) at the site boundary.

Compliance to the Occupational Health and Safety Act, Act 85 of 1993.

Hearing protection to employees.

Machinery and Plant properly maintained and fitted with a silencer.

1.2 Air quality:

Mitigation measures

Avoidance of unnecessary removal of vegetation.

Routine spraying of unpaved site areas and roads with water.

Re-vegetation of rehabilitated areas.

1.3 Domestic and Industrial Waste Disposal

Alternatives for the disposal of domestic waste is through off- site disposal using the Griekwastad municipal waste disposal site.

Considering the small labour force, very little domestic waste is envisaged.

Domestic waste will therefore be collected in receptacles at the site offices on campsite and removed on regular basis for disposal.

Oils are largely re-useable, and an arrangement is in place whereby waste oil is bought for recycling (i.e. by a company such as Oilcor). Batteries are sent to the battery centre in Griekwastad for recycling. Minimal scrap and other industrial waste is produced during prospecting activities, which is sold for recycling as required. All industrial and hazardous waste is stored at the maintenance / workshop / store area.

1.4 Land use Options after Rehabilitation

As the excavations are backfilled to 100% and fully rehabilitated after the completion of bulk sampling activity block-by-block, the prospecting areas will ultimately be incorporated into farm activities (with minimal topographical undulations due to the bulking factor in backfilled areas). The backfill used would be oversize material and waste material. No slime would be introduced into excavations

1.5 Pollution Control Systems

Practically horizontal surface near the Plant site eliminates risk of slime spillage. The waste do not therefore constitute a pollution risk to the surface water system.

The fact that the mineral processing method does not utilise any chemicals eliminates the need for surface water pollution control structures at the plant.

The workshop / maintenance / storage area (enclosed in the fenced campsite) is the only area in which pollution and contamination may occur as a result of hydrocarbon spillages, so standard pollution containment measures will be in place. The work areas and diesel tank storage areas will be underlain with a concrete floor (or another approved impermeable layer), contained by a bund wall and sloped toward toe trenches leading to collection sumps). No runoff will be allowed to flow through this area, and no contaminated water from within the areas will be allowed to enter the surrounding environment.

ix) Motivation where no alternative sites were considered.

The applicant cannot consider any alternative site for prospecting as the geology is not known.

x) Statement motivating the alternative development location within the overall site. (Provide a statement motivating the final site layout that is proposed)

The applicant seek to develop and perform the prospecting activity in a responsible manner with minimum affect to the environment, disturbance to the current activities on the farm and therefor identified the particular site layout.

h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity. (Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

The different environmental components on which the project can/may have an impact are:-

- q) Geology
- r) Topography
- s) Soil
- t) Land Capability
- u) Land Use
- v) Vegetation (Flora)
- w) Wild Life (Fauna)
- x) Surface Water
- y) Ground Water
- z) Air Quality
- aa) Noise
- bb) Archaeological and Cultural Sites
- cc) Sensitive Landscapes
- dd) Visual Aspects
- ee) Socio-economic Structure
- ff) Interested and Affected Parties

4) **Impact Assessment**

Before the impact assessment could be done the different project activities were identified.

5) **Activities**

- g) Roads and hauling
- h) Trenching
- i) Temporary waste dump area and topsoil storage area
- j) Mine residue deposit dam
- k) Plant and Processing area
- l) Temporary office, workshops, ablution facilities, water tanks, diesel tanks and other temporary buildings

6) Environmental Impact Assessment Summary

Table 2-Environmental Impact Summary

ENVIRONMENTAL ASPECTS	AFFECTED	AFFECTED	NOT AFFECTED
	NEGLIGABLE	SUBSTANTIAL	
GEOLOGY	x		
TOPOGRAPHY	X		
SOIL		x	
LAND CAPABILITY	x		
LAND USE	x		
VEGETATION		x	
WILDLIFE	x		
SURFACE WATER	x		
GROUND WATER			X
AIR QUALITY		x	
NOISE		x	
SENSITIVE LANDSCAPES			x
VISUAL ASPECTS		x	
SOCIO ECONOMICS (POSITIVE)	x		
INTERESTED AND AFFECTED PARTIES	x		
ARCHAEOLOGICAL			X

5) Environment likely to be affected by the alternative land use.
 Assessment of the impacts created by the prospecting activity
 Before any assessment can be made the following evaluation criteria need to be described:

Table 3-Explanation of probability of impact occurrence

Probability of impact occurrence	Explanation of probability
Very Low	<20% sure of particular fact or likelihood of impact occurring
Low	20-39% sure of particular fact or likelihood of impact occurring
Moderate	40-59% sure of particular fact or likelihood of impact occurring
High	80-79% sure of particular fact or likelihood of impact occurring
Very High	80-99% sure of particular fact or likelihood of impact occurring
Definite	100% sure of particular fact or likelihood of impact occurring

Table 4-Explanation of extend of impact

Extent of Impact	Explanation of extent
Site specific	Direct and indirect impacts limited to site of impact only
Local	Direct and indirect impacts affecting environmental elements within the study area
Regional	Direct and indirect impacts affecting environmental elements within the Northern Cape
National	Direct and indirect impacts affecting environmental element on national level
Global	Direct and indirect impact affecting environmental elements on global level

Table 5-Explanation of duration of impact

Duration of impact	Explanation of duration
Very short	Less than 1 year
Short	1 to 5 years
Medium	6 to 12 years
Long	13 to 50 years
Very long	Longer than 50 years
Permanent	Permanent

Table 6-Explanation of impact significance

Impact significance	Explanation of significance
No impact	There will be no impact at all not even a very low impact on the system or any of its parts
Very low	Impact will be negligible. In the cast of negative impact, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be

	needed would be easy, cheap and simple. In the case of positive impacts alternative means would almost all likely be better, if one or a number of ways, then this means of achieving benefit
Low	Impact would be of low order and with little real effect. In the case of negative impacts, mitigation and /or remedial activity would be either easily achieved or little would be required or both. In the case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time consuming, or some combination of these
Moderate significance	Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and /or remedial activity would be feasible and fairly easily possible. In the case of positive impacts other means of covering these benefits would be about equal in cost and effort
High significance	Impacts of substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these. In the case of positive impact other means of achieving this benefit would be feasible but would be more difficult, expensive, time consuming or some combination of these
Very high significance	Of the highest order possible within the bounds of impact which could occur, in the case of negative impacts, there would be no possible mitigation and /or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impact there is no real alternative to achieving the benefit

Table 7 -Impacts – Aspect Geology

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Geology-competent rock will be destroyed during the prospecting operation. Waste rock material/ overburden material is disposed of/backfilled in existing	

	excavations as part of the prospecting process	
Extent	Site	Activity causing the impact
Duration	Permanent	An open cast bulk sampling will be used to extract diamonds. Therefore the original geology will be totally destroyed in certain areas.
Probability	Definite	
Significance	Low	

Table 8-Impacts – Aspect Topography

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	<ul style="list-style-type: none"> • Change in landform • The mining site is situated on undulating terrain • Disturbance of the surface <p>The bulk sampling programme of the alluvial deposits will result in the creation of excavations that act as depressions in the environment that captures run-off. Normal surface drainage will be disturbed on a given point. Run-off if any will be diverted away from the specific site</p>	
Extent	Site	Activity causing the impact
Duration	Very long to permanent	Bulk sampling through excavations
Probability	Definite	
Significance	High	

Table 9-Impacts – Aspect Soil

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	The surface area is characterised by various soil depths. Any construction of infrastructure should be preceded by the removal of all available topsoil	
Extent	Site	Activity causing the impact

Duration	Long	In the process of removing topsoil the soil layers are mixed and the structure may be disturbed
Probability	High	
Significance	Moderate	

Table 10-Impacts – Aspect Soil

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	The establishment, construction, operation and eventually rehabilitation (demolition) of listed structures such as the access roads, stockpiles. Tailings dumps, cause compaction of soil. All mining activities will be concentrated on the targeted mining area where alluvial deposits could be found. In the same time a certain surface area is therefore alienated. The active prospecting surface are (alienated) would be restricted within the minimum area required for prospecting purposes	
Extent	Site	Activity causing the impact
Duration	Very short	When removing topsoil during site preparation, the storm water control structures are in place. If a severe storm hits the area, it may lead to erosion on site. Topsoil stockpiles may be prone to erosion due to lack of vegetation cover water control structures may fail or severe rainstorms may cause excess run-off. Surface compaction due to activities taking place
Probability	Very low	
Significance	Low	

Table 11-Impacts – Aspect Soil

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Potential of soil contamination	
Extent	Site	Activity causing the impact
Duration	Long	Vehicle/ equipment breakages and oil/

		lubricant, diesel spills may contaminate soil
Probability	Moderate	
Significance	Moderate	

Table 12-Impacts-Aspect Soil

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Loss of soil structure	
Extent	Site	Activity causing the impact
Duration	Long	In the process of removing topsoil the soil layers are mixed and the structure may be disturbed
Probability	High	
Significance	Moderate	

Table 13-Impacts – Aspect Soil

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Loss of soil fertility	
Extent	Site	Activity causing the impact
Duration	Short	The mixing of the soil during site preparation compaction and potential pollution (spillages from oil etc.) all may cause loss of soil fertility
Probability	Definite	
Significance	Low	

Table 14-Impacts – Aspect Land Use

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Temporary loss of land use for residential or commercial use until prospecting is completed.	
Extent	Site	Activity causing the impact
Duration	Short	Bulk sampling and prospecting infrastructure.
Probability	Low	
Significance	Low	

Table15-Impacts – Aspect Vegetation

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Vegetation clearance and disturbance. Due to disturbed ecosystem, bare ground and spreading of exotics can follow.	
Extent	Site	Activity causing the impact

Duration	Permanent	Bulk sampling Programme.
Probability	Definite	
Significance	High	

Table 16-Impacts – Aspect Vegetation

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Habitat change, loss of species, spread of alien invasive species	
Extent	Site	Activity causing the impact
Duration	Permanent	The change in the habitat would be mitigated during final rehabilitation
Probability	High	
Significance	Moderate	

Table 17-Impacts – Aspect Vegetation

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Dust covering of plants	None
Extent	Site	Activity causing the impact
Duration	Long	Heavy trucks and other vehicles as well as the dumping of tailings.
Probability	High	
Significance	Low	

Table 18-Impacts – Aspect Fauna

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Wildlife habitat destruction, change /disturbance	
Extent	Site	Activity causing the impact
Duration	Permanent	The flora which normally serves as habitat for animals would be destroyed. The animals would be scared of the increase in activity. The area will serve as habitat after rehabilitation.
Probability	Very High	
Significance	Moderate	

Table 19-Impacts – Aspect Wildlife

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Injury or death to wildlife	None
Extent	Site	Activity causing the impact
Duration	Short	The movement of vehicles might kill certain insets, rodents, and possible birds. Most of the remaining animal life will

		move away due to the dust and noise.
Probability	Low	
Significance	Low	

Table 20-Impacts – Aspect Surface Water

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Increased silt load. Clearing topsoil for footprint areas can increase infiltration rates of water to the groundwater system and decrease buffering capacity of soils to absorb contamination from soils to surface. This can increase the risk of contamination of the groundwater system.	
Extent	Local	Activity causing the impact
Duration	Short	The clearance of vegetation and the traffic on access roads will all contribute to an increase in the silt load on the prospecting area.
Probability	Moderate	
Significance	Moderate	

Table 21-Impacts – Aspect Surface Water

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Change in surface water quality. Spillages from vehicles and also surface water run-off could end-up in excavations creating problems with the water quality.	
Extent	Local	Activity causing the impact
Duration	Short	Dirty/clean water systems at facilities like the overburden dumps, roads, trenches, may impact on the quality of the surface water.
Probability	Moderate	
Significance	High	

Table 22-Impacts – Aspect Ground Water (Orange River)

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Reduction in ground water quality. This prospecting process does not make use of	

	any chemicals that may impact on the groundwater system. Handling of waste can cause various types of spills (domestic waste, french hydrocarbons) which can infiltrate and contaminate the groundwater system.	
Extent	Site	Activity causing the impact
Duration	Long	
Probability	Definite	
Significance	High	

Table 23-Impacts – Aspect Air Quality

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Dust will be created during the trenching, transport of material and processing plant stage. The site is remote from any residential area and will have no negative impacts. Impact would be more direct to worker environment and the requirements of the Mine Health and Safety requirements observed.	
Extent	Site	Activity causing the impact
Duration	Long	Bulk sampling by means of excavations, TMM's on the roadways and transfer points in the plant.
Probability	Moderate	
Significance	Moderate	

Table 24-Impacts – Aspect Noise Pollution

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Noise will be generated during the loading and hauling process, also the processing plant with the scrubbers, pans and screens. Impact will be concentrated in the worker environment.	
Extent	Local	Activity causing the impact
Duration	Long	Earth moving equipment and plant
Probability	Definite	
Significance	Moderate	

Table 25-Impacts – Aspect Archaeological and Cultural Sites

ASPECT	IMPACTS	CUMULATIVE IMPACTS
--------	---------	--------------------

Nature of the impact	The terrain is not archaeologically sensitive	
Extent	Site	Activity causing the impact
Duration	Permanent	
Probability	Low	
Significance	Low	

Table 26-Impacts – Aspect Sensitive Landscape

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	No sensitive landscape identified	
Extent	Not applicable	Activity causing the impact
Duration	Not applicable	
Probability	Not applicable	
Significance	Not applicable	

Table 27-Impacts – Aspect Socio Economic

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	Increase in socio-economic activity at local level.	Will add to the increase in socio-economic activity for Griekwastad.
Extent	Local	Activity causing the impact
Duration	Long	Additional employment opportunity created.
Probability	Definite	
Significance	High	

Table 28-Impacts – Aspect Interested and affected Parties

ASPECT	IMPACTS	CUMULATIVE IMPACTS
Nature of the impact	No negative impacts are foreseen.	
Extent	Local	Activity causing the impact
Duration	Long	
Probability	High	
Significance	High	

i) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation..	SIGNIFICANCE if mitigated
Roads	Air Quality	Nuisance dust would be created by the prospecting equipment and load and hauling of the material between the open pit and the plant.	Construction and Operational phase	Medium	To wet roads or use a dust agent.	Low
	Flora	New haulage roads will destroy the vegetation	Construction	High	Re-establish self-sustaining vegetation units in rehabilitated areas; and control invasion by exotic and invasive plant species	Low
	Fauna	New haulage roads will destroy the vegetation	Construction	High	Re-establish vegetation in cleared areas and therefor a habitat to wildlife and eliminate poaching and the extermination of animal species within	Low

					the boundaries of the prospecting area.	
	Ground Water	No Impact expected from the new haulage roads	Construction	No Significance	To minimise and prevent the contamination of ground water	None
	Noise	Noise from the mining equipment on the haulage roads.	Construction	Low	Control the incidence of unacceptable noise levels.	No Significance
	Soil	No Significance	Construction	No Significance	No Significance	No Significance
	Surface Water	No impact to surface water is expected from the new roads.	Construction	No Significance	Water conservation. Eliminate the contamination of run-off surface water.	No Significance
	Topography	No impact topography is expected from the new roads.	Construction	No Significance		No Significance
	Visual	The roads will be visible to some extent from the immediate surroundings	Construction	Low	Minimise aesthetic disturbance. Reduce the visual impact through continuous rehabilitation. Institute a Waste Management program that will reduce the visibility effect. Introduce a dedicated waste disposal area.	Low
	Archaeological	Artefacts will be visible probable on surface	Construction	Medium	Archaeological awareness Program Artefacts chart and examples	Low
Excavations	Air quality	Nuisance dust would be created by the prospecting equipment	Operational	Medium	Avoidance of unnecessary removal of vegetation. Routine spraying of unpaved areas. Re-vegetation of rehabilitated areas not occupied by plant infrastructure.	Low
	Fauna	New trenches will disturb and destroy the natural habitat of the animals.	Operational	High	If any endangered species is found they must be reported to Department of Nature Conservation/relocated. Any form of poaching by outsiders will be reported to the authorities. Company employees would be severely disciplined.	Medium

					Any type of snares and traps would be removed.	
	Flora	New trenches will disturb and destroy the natural vegetation.	Operational	High	<p>Indigenous vegetation to be used for landscaping to minimise water requirements.</p> <p>Any area that is rehabilitated or decommissioned will be seeded with a seed mixture reflecting the natural vegetation as is currently found.</p> <p>Management will control invader or exotic species on the site.</p> <p>General Treatment Procedure for invader or exotic species: Plants uprooted or cut off and can be destroyed completely.</p> <p>Only herbicides used that is registered for that purpose.</p> <p>Valid licences obtained from the Free State Nature Conservation before protected plants are removed.</p> <p>Fires will only be allowed in demarcated areas build for that purpose.</p>	Low
	Ground Water	No impact to ground water is expected from the trenching and pitting operations.	Operational	No Significance	No significance	No Significance
	Noise	Noise impact from the equipment and machinery will be created	Operational	Medium	<p>82dB(A)at the site boundary.</p> <p>Compliance to the Occupational Health and Safety Act, Act 85 of 1993.</p> <p>Comply with a program of good practice with regard to noise related impacts.</p> <p>If complaints are received from the public or state, noise levels will be monitored at prescribed monitoring points to ensure compliance within limits.</p>	Medium

					<p>Mechanical equipment /vehicles fitted with silencers and periodic maintenance program to ensure compliance with the Road Traffic Act.</p> <p>Hearing Protection available to all employees and visitors to the site.</p> <p>Screening/Migration control</p> <p>Appropriate measures installed to reflect/reduce noise.</p>	
	Soil	The disturbance of the soil structure during trenching.	Operational	High	<p>Prevent soil pollution.</p> <p>Limit soil compaction.</p> <p>Curb soil erosion.</p> <p>Reinstate growth medium able to sustain plant life.</p> <p>In all places will the first 300mm weathered or loose material be classified as growth medium.</p> <p>In all areas where the above medium will be impacted on, it will be removed and stockpiled of 2.5m height.</p> <p>The growth medium would be used during rehabilitation phase on the impacted areas.</p> <p>If any soil is contamination during the life of the prospecting program, it will be removed with the industrial waste to a recognized facility or company.</p> <p>Topsoil will be kept separate from overburden and will not be used for road maintenance.</p>	High
	Surface water	No impact on surface water is expected during the trenching activities	Operational	No Significance	<p>Water conservation and elimination of run-off water contamination of surface water.</p> <p>.</p>	No Significance
	Topography	Changing of natural slopes	Operational	Low	To reduce the potential of the surface erosion caused by run-off in excavated	Low

		by pitting activities			and backfilled areas; and to ensure the stability and safety of all backfilled excavation	
	Visual	The excavation will be visible to some extent from the immediate surroundings	Operational	No significance	No Significance	No significance
	Archaeological	Artefacts will be visible probable on surface	Operational	Medium	Archaeological awareness Program Artefacts chart and examples	Low
Temporary waste dump area & Topsoil Storage area	Air quality	Nuisance dust will be created by the prospecting equipment when the material is dumped/ stockpiled in these areas	Commissioning	Medium	Air quality: To limit the creation of nuisance dust the following management guidelines will be followed: Avoidance of unnecessary removal of vegetation: Routine spraying of unpaved site areas road and waters with water; Re-vegetation of rehabilitated areas not occupied by plant infrastructure to take place as soon as possible	Medium
	Fauna	The natural habitat of the animals will be disturbed and/ or destroyed in these areas	Commissioning	High	If any endangered species are found on the study area, they will be relocated. If this is not possible potential changes in the habitat of endangered species will be monitored. The above programme will also focus on species that depend on specific host plants or on specific symbiotic relationships with specific reference to possible impacts such related to emissions from the operation. Any form of poaching by workers from the company will result in the max form of punishment as allowed for by common law. Any form of snares or traps on the site will be removed. If any endangered species are encountered the Department of Nature Conservation will be contacted	High
	Flora	Where new pits/ excavations will	Commissioning	High	Indigenous vegetation to be used for landscaping to minimize watering	High

		be created the vegetation will be disturbed and / or destroyed			requirements. Any area that rehabilitated or decommissioned will be seeded with a seed mixtures reflecting the natural vegetation as is currently found. If this is not to be feasible during rehabilitation a general seed mixture of the area will be used. Management will also take responsibility to control declared invader or exotic species on the study area. The following control methods will be used: The plant will be uprooted felled or cut off and can be destroyed completely. The plants will be treated with an herbicide that is registered for use in connection therewith and in accordance with the direction for the use of such an herbicide; The end objective of the re-vegetation program will be to achieve a stable self-sustaining habitat unit; Vegetation on flat surfaces will be established using dry land technique requiring no irrigation; Valid permits from the Nature Conservation will be obtained before any protected plant species are removed; Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a firebreak will be cleared around the perimeter of the prospecting area.	
	Ground water	No impact to groundwater is expected from the creation of excavations	Commissioning	No Significance	No significance	No Significance
	Noise	Noise impact from the prospecting equipment will be created	Commissioning	Medium	Noise: As a minimum, ambient noise levels emanating from the prospecting activity will not exceed 82 dB(A) at the site boundary:	Medium

					<p>The applicant will comply with the occupational noise regulations of the Occupational Health and Safety Act, Act 85 of 1993.</p> <p>The applicant will comply with the measures for good practice with regard to management of noise related impacts during construction and operation. The management objective will be able to reduce any level of noise, shock that may have effect on persons or animals, both inside the plant and that which may migrate outside the plant area.</p> <p>When the equivalent noise exposure, as defined in the South African Bureau of Standards Code of Practice for the Measurement and Assessment of Occupational Noise for Hearing Conservation Purposes, SABS 083 as amended, in any place at or in any mine or works where persons may travel or work exceeds 82 Db(A), the site manager will take the necessary steps to reduce the noise below this level.</p> <p>Hearing protection will be available for all employees where attenuation cannot be implemented. If any complaint is received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.</p> <p>Mechanical equipment: All mechanical equipment will be in good working order and vehicles will adhere to the relevant noise requirements of the Road Traffic Act.</p> <p>All vehicles in operation will be equipped with a silencer on their exhaust system.</p> <p>Safety measures, which generate noise such as reverse gear alarms on large vehicles, will be appropriately calibrated/</p>	
--	--	--	--	--	---	--

					<p>adjusted. Screening/ Migration control; Appropriate measures will specifically be installed and or employed at the plant to act as screen and to reflect/reduce the noise. Appropriate non-metallic washers/ insulation will be used with any joining apparatus to join screens such as corrugated iron to other structures and to each other. Such screens will be maintained in a fixed position</p>	
	Soil	The disturbance of the soil structures during excavation activities	Commissioning	High	<p>Soils To prevent soil pollution To limit soil compaction To curb soil erosion; and To reinstate a growth medium able to sustain plant life. In all place of development the first 300mm of loose or weathered material found will be classified as a growth medium. In all areas where the above growth medium impacted on, it will be removed and stockpiled on a dedicated area. The maximum height of stockpiles will be 2.5 meters. The growth medium/topsoil will be used during the rehabilitation of any impacted areas, after sloping in order to re-establish the same land capability. If any soil is contaminated during the life of prospecting, It will either be treated on site or be removed together with the contaminant and placed in acceptable containers to be removed with the industrial waste to a recognized facility or company. Erosion control in the form of re-vegetation and contouring of slopes will be implemented on disturbed areas in and around the site.</p>	High

					Topsoil will be kept separate from overburden and will not be used for building or maintenance of access roads. The stored topsoil will be adequately protected from being blown away or being eroded.	
	Surface water	No impact to surface water is expected during excavation activities.	Commissioning	No Significance	To conserve water; and To eliminate the contamination of run-off and sources of surface water.	No Significance
	Topography	Changing of natural slopes by open pit activities	Commissioning	Low	To reduce the potential of surface erosion caused by runoff in excavated and backfilled areas; and To ensure the stability and safety of all backfilled excavation	Low
	Visual	The excavations will be visible to some extent from immediate surroundings,	Commissioning	No Significance		No Significance
Plant and Processing Area, Offices, Ablution Facilities	Air Quality	Nuisance dust will be created by the processing plant.	Operational	Medium	Air quality: To limit the creation of nuisance dust the following management guidelines will be followed: Avoidance of unnecessary removal of vegetation: Routine spraying of unpaved site areas road and waters with water; Re-vegetation of rehabilitated areas not occupied by plant infrastructure to take place as soon as possible	Low
	Fauna	The natural habitat of the animals will be disturbed or destroyed when the plant residue is created.	Operational	High	If any endangered species are found on the mine they will be relocated. If this is not possible potential changes in the habitat of endangered species will be monitored. The above programme will also focus on species that depend on specific host plants or on specific symbiotic relationships with specific reference to possible impacts such related to emissions from the operation.	Low

					Any form of poaching by workers from the company will result in the max form of punishment as allowed for by common law. Any form of snares or traps on the site will be removed. If any endangered species are encountered the Department of Nature Conservation will be contracted.	
	Flora	The natural vegetation will be disturbed when the plant is created.	Operational	High	Indigenous vegetation to be used for landscaping to minimize watering requirements. Any area that rehabilitated or decommissioned will be seeded with a seed mixtures reflecting the natural vegetation as is currently found. If this is not to be feasible during rehabilitation a general seed mixture of the area will be used. Management will also take responsibility to control declared invader or exotic species on the study area. The following control methods will be used: The plant will be uprooted felled or cut off and can be destroyed completely. The plants will be treated with an herbicide that is registered for use in connection therewith and in accordance with the direction for the use of such an herbicide; The end objective of the re-vegetation program will be to achieve a stable self-sustaining habitat unit; Vegetation on flat surfaces will be established using dry land technique requiring no irrigation; Valid permits from the Northern Cape Nature Conservation will be obtained before any protected plant species are removed; Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a firebreak will be cleared around the perimeter of the operation.	Low

	Groundwater	No impact to groundwater expected.	Operational	No Significance		No Significance
	Noise	Noise from the plant and prospecting equipment will be created.	Operational	Medium	<p>Noise: As a minimum, ambient noise levels emanating from the operation will not exceed 82 dB(A) at the site boundary:</p> <p>The applicant will comply with the occupational noise regulations of the Occupational Health and Safety Act, Act 85 of 1993.</p> <p>The applicant will comply with the measures for good practice with regard to management of noise related impacts during construction and operation. The management objective will be able to reduce any level of noise, shock that may have effect on persons or animals, both inside the plant and that which may migrate outside the plant area.</p> <p>When the equivalent noise exposure, as defined in the South African Bureau of Standards Code of Practice for the Measurement and Assessment of Occupational Noise for Hearing Conservation Purposes, SABS 083 as amended, in any place at or in any mine or works where persons may travel or work exceeds 82 Db (A), the site manager will take the necessary steps to reduce the noise below this level. Hearing protection will be available for all employees where attenuation cannot be implemented. If any complaint is received from the public or state department regarding noise levels .The levels will be monitored at prescribed monitoring points.</p> <p>Mechanical equipment: All mechanical equipment will be in good working order and vehicles will adhere to the relevant</p>	Low

					<p>noise requirements of the Road Traffic Act.</p> <p>All vehicles in operation will be equipped with a silencer on their exhaust system.</p> <p>Safety measures, which generate noise such as reverse gear alarms on large vehicles, will be appropriately calibrated/adjusted.</p> <p>Screening/ Migration control; Appropriate measures will specifically be installed and or employed at the plant to act as screen and to reflect/reduce the noise.</p> <p>Appropriate non-metallic washers/insulation will be used with any joining apparatus to join screens such as corrugated iron to other structures and to each other. Such screens will be maintained in a fixed position.</p>	
	Soil	The disturbance of the soil structure when the plant and processing area is created.	Operational	High	<p>Soils</p> <p>To prevent soil pollution</p> <p>To limit soil compaction</p> <p>To curb soil erosion; and</p> <p>To reinstate a growth medium able to sustain plant life.</p> <p>In all place of development the first 300mm of loose or weathered material found will be classified as a growth medium.</p> <p>In all areas where the above growth medium impacted on, it will be removed and stockpiled on a dedicated area. The maximum height of stockpiles will be 2.5 meters.</p> <p>The growth medium/topsoil will be used during the rehabilitation of any impacted areas, after sloping in order to re-establish the same land capability.</p> <p>If any soil is contaminated during the life of the operation, It will either be treated on site or be removed together with the</p>	High

					<p>contaminant and placed in acceptable containers to be removed with the industrial waste to a recognized facility or company.</p> <p>Erosion control in the form of re-vegetation and contouring of slopes will be implemented on disturbed areas in and around the site.</p> <p>Topsoil will be kept separate from overburden and will not be used for building or maintenance of access roads.</p> <p>The stored topsoil will be adequately protected from being blown away or being eroded.</p>	
	Surface Water	Surface water not utilised	Operational	Medium	To conserve water; and To eliminate the contamination of run-off and sources of surface water.	Medium
	Topography	No impact to the topography is expected from the plant and processing area.	Operational	No Significance		No Significance
	Visual	The plant and processing area will be visible to the immediate surroundings.	Operational	Low	The main objective of the applicant is to rehabilitate the whole site in such a way to ensure that the topographical landscape would blend in with the surrounding landscape, not pose a safety hazard to humans and animals, while at the same time allow for alternative land uses.	Low

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked **Appendix**

j) Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
To Be Commissioned	Scoping Phase Heritage Report		

k) Environmental impact statement

(i) Summary of the key findings of the environmental impact assessment;

The prospecting operation will definitely have an impact on the environment. The main impacts relate to the increased in noise levels from the TMM's used in the operation. The increased dust pollution can to great extend be mitigated using the spraying of the road ways used by the TMM's and LDV's. The current fauna and flora will be totally destroyed during the operation on the excavations and plant site, but the farm will then be available for alternative use. Absolute care should be given not to extend the operation after 17:00 daily. The applicant should further embark on a Heritage and Cultural program to sensitise all employees towards these resources.

(ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers .

TO BE COMPLETED AFTER INPUTS FROM ALL INTERESTED AND AFFECTED PARTIES

(iii) Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;

Positive Impacts and Risks	Description
Socio-economic.	The creation of new job opportunities through the prospecting operation and the spin-off thereof..
Topography	Improved topography to original state before dumping of tailings
Land use	Alternative use-residential and commercial
Safety Risks	Hide out place for criminal activity
Increased revenue to state / Taxes	Taxes payable to state and local government
Negative Impacts and Risks	Description
Noise	Increased noise pollution during project
Dust Pollution	More Nuisance dust created during project.
Destruction of Fauna and Flora	The fauna and flora habitat created by the dumps and infrastructure will be destroyed
Surface and Ground water pollution	Low possibility of occurrence
Sterilisation of mineral resource	Diamond resource sterilised if not proceeded with the project
Visual impact	Unightly tailings dump during prospecting operation
Archaeological	Destruction of sources

l) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

The proposed impact management objective is to create environmental sustainable prospecting operation by the management, remediation or elimination of the environment impacts through the implementation and adherence of mitigation measures as legislatively required.

The above mentioned outcomes can be achieved through the implementation of the following impact specified objectives and their outcomes:

- Prevention of soil pollution due to chemical spillage
 - Regular maintenance of all TMM's
 - Immediate rehabilitation of an affected area
 - Suitable disposal of contaminated soil
- Reduction of noise levels caused by TMM's
 - Strict adherence to shift and operating hours
 - Noise reduction modifications to earth moving machinery
 - Zero tolerance approach to permissible

- Minimization of dust upliftment causing loss of air quality
 - Watering of all dirt roads
 - Adherence to speed limits
 - Proper loading practise
- Surface and ground water quality degradation
 - Implementation of ground water monitoring system
 - Storm water control
 - Adherence to water management guidelines
- Waste disposal
 - Implementation of waste disposal facilities
 - Waste removal schedules
 - Practise of good housekeeping

m) Final proposed alternatives.

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

The proposed impact management objective is to create environmental sustainable prospecting operation by the management, remediation or elimination of the environment impacts through the implementation and adherence of mitigation measures as legislatively required.

The above mentioned outcomes can be achieved through the implementation of the following impact specified objectives and their outcomes:

- Prevention of soil pollution due to chemical spillage
 - Regular maintenance of all TMM's
 - Immediate rehabilitation of an affected area
 - Suitable disposal of contaminated soil
- Reduction of noise levels caused by TMM's
 - Strict adherence to shift and operating hours
 - Noise reduction modifications to earth moving machinery
 - Zero tolerance approach to permissible
- Minimizing of vegetation loss caused by construction and site maintenance:
 - Vegetation clearing control

- Rip and rehabilitation of unnecessary compacted areas
- Adherence to mine roads
- Implementation of a no collection and no open fire policy
- Minimization of dust upliftment causing loss of air quality
 - Watering of all dirt roads
 - Adherence to speed limits
 - Proper loading practise
- Surface and ground water quality degradation
 - Implementation of ground water monitoring system
 - Storm water control
 - Adherence to water management guidelines
- Waste disposal
 - Implementation of on-site waste disposal facilities
 - Waste removal schedules
 - Practise of good housekeeping

Water Pollution Management Facilities

Sewage Plant

No sewage plant will be required for the purpose of this project. Sewage on site will be handled by means of chemical toilets and French latrines both at the fixed and mobile operation units.

Pollution Control Systems.

Practically horizontal surface near the Plant site eliminates risk of slime spillage. The waste and tailings do not therefore constitute a pollution risk to the surface water system.

The fact that the mineral processing method does not utilise any chemicals eliminates the need for surface water pollution control structures at the plant.

The workshop / maintenance / storage area (enclosed in the fenced campsite) is the only area in which pollution and contamination may occur as a result of hydrocarbon spillages, so standard pollution containment measures will be in place. The work areas and diesel tank storage areas will be underlain with a concrete floor (or another approved impermeable layer), contained by a bund wall and sloped toward toe trenches leading to collection sumps). No runoff will be allowed to flow through this area, and no contaminated water from within the areas will be allowed to enter the surrounding environment.

Potable Water Plant

No potable water plant is required for this operation. Drinkable water is available from borehole sources.

Process water supply system

Process water for the scrubbing process and for diamond recovery on the grease belts is pumped directly from the canal. Once scrubbing is complete, this water is relayed to 5 000 litre storage tanks for use in the gravity separation process at the portable process plants. Wastewater from this process is disposed of directly into the slimes dam. This wastewater then evaporates and / or infiltrates.

Mineral processing plant

Treatment of the manganese ore.

Workshops, Administration and Other Buildings

A workshop / maintenance / storage yard is located at the main campsite complex. Emergency repairs will be done on the digging sites, as they are required.

Housing, Recreation and Other Employee Facilities.

No housing for company employees is required for this operation.

Transport

Dump trucks are used on the site to transport waste rock as required. These vehicles will keep to a defined path and graded routes wherever possible. Adherence to a Traffic Management Plan will be enforced.

Water Balance Diagram

No water will be used for processing. The water use will be restricted to dust allaying.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

The final layout was done with due consideration of the following factors:

Placement of plant and infrastructure to avoid any contamination to the surface watery.

The least disturbance to the natural Fauna and Flora on the farm.

The proximity of the mineral resource to the plant to minimise the development of access and prospecting roads.

The placement of infrastructure and plant would have the minimum negative impact on the geology, topsoil, landscape, noise and air pollution.

o) Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

If any assumptions, uncertainties and gaps in knowledge arise during the operation, mitigation measures would be taken to eliminate any damage to the environment. The relevant Department would be notified in the event of such an occurrence.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not.

It is my opinion that the activity be authorised as the positive impacts far outweigh the negative. The operation proof to have a long term positive effect on the socio-economic, physical and especially land use after the prospecting operation. There is no reason why the activity should not be authorized.

ii) Conditions that must be included in the authorisation

(1) Specific conditions to be included into the compilation and approval of EMPr

None other than the implementation of the EMPr with particular reference to the mitigation measures as stipulated within the EMPr.

(2) Rehabilitation requirements

None other than the implementation of the EMPr with particular reference to the mitigation measures as stipulated within the EMPr.

q) Period for which the Environmental Authorisation is required.

5 Years

r) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

I, J Mabena, Director of Hard Rock MN2, hereby undertake to meet the requirements as provided at the end of the ENVIRONMENTAL IMPACT ASSESSMENT REPORT And ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

i) Explain how the aforesaid amount was derived.

The rehabilitation cost will be determined by using DMR guideline. The estimation of rehabilitation cost is due to the prospecting activities conducted. The financial provision quantum guarantee will be paid at the DMR rehabilitation account to cover the rehabilitation and/or management of negative environmental impacts.

Plant Site 800m², Workshop 300m², Stockpiles 1500m², Topsoil Storage 500m², Ablution Facilities 25m², Chemical Storage 25m², Diesel Storage 32m², Site Office 25m², Domestic Waste Facility 16m², Roads 400m², Waste Dumps 1000m²:Total Footprint 14623m².

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 structures	m ³	800	14.45	1	1	11560
2(A)	Demolition of steel buildings and structures	m ²	300	201.35	1	1	60405
2(B)	Demolition of reinforced concrete buildings and structures	m ²	32	296.72	1	1	9495.04
3	Rehabilitation of access roads 400m ² remain for future use	m ²	400	36.03	1	1	14412
4(A)	Demolition and rehabilitation of electrical railway lines	m		349.71	1	1	
4(B)	Demolition and rehabilitation of non-electrical railway lines	m		190.75	1	1	
5	Demolition of housing and/or	m ²	91	402.70	1	1	36645.70

i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-

(1) Impact on the socio-economic conditions of any directly affected person. (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 2.19.1** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

The prospecting activities will contribute to the local economy via its impact on job creation, total disposable income and value added activities. The operation would further support local businesses in Griekwastad for the supply of prospecting programme consumables.

Five measures of economic impacts can be defined to demonstrate the positive effect of the proposed operation on the local economy of Griekwastad.

- The employment opportunities created
- The income that employees would derive
- The CAPEX spend on fixed assets
- The monthly operational expenditure for consumables (OPEX)
- Revenue- the total value of sales arising from the sale of diamonds recovered.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act. (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

Field indications conducted suggests that virgin ground would be mined. My conclusion is that the prospecting operation will have no impact on the heritage resource of the Free State Province

v) Other matters required in terms of sections 24(4)(a) and (b) of the Act.

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as **Appendix 4**).

A field visit was conducted for investigation and an in-depth desktop study conducted using existing literature and data.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

a) **Details of the EAP**, (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

Confirmed by M A Goliath

b) **Description of the Aspects of the Activity** (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

Confirmed by M A Goliath

c) **Composite Map**

(Provide a map (**Attached as an Appendix**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

**TO BE COMPLETED AFTER INPUTS FROM ALL
INTERESTED AND AFFECTED PARTIES**



Plant Site 800m², Workshop 300m², Stockpiles 1500m², Topsoil Storage 500m², Ablution Facilities 25m², Chemical Storage 25m², Diesel Storage 32m², Site Office 25m², Domestic Waste Facility 16m², Roads 400m², Slimes Dam 10000m², Waste Dumps 1000m²:Total Footprint 14623m².

d) Description of Impact management objectives including management statements

- i) **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

Closure Objectives:

- The main objective would be to leave the environment in the same state as before.
 - To prevent sterilization of ore reserves.
 - To prevent the erection of permanent structures.
 - Establish a self-sustainable vegetation growth.
 - To limit and rehabilitate any erosion features and prevent any damage to the soil capacity.
 - To limit and manage the visual impact.
 - Ensure health and safety of all humans and animals that may be affected by the activities.
 - The last closure objective is that the mine is closed efficiently, cost effectively and in accordance with government policy.
- ii) **The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.**
- Develop a Baseline Environmental Risk Assessment with particular focus on possible environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation and the remedial measures that must be taken. The Risk Assessment should have clear timeframes for the monitoring process and clearly defined roles of responsibilities.
- Develop appropriate policies, procedures and standards to ensure firstly that;
- All adverse environmental damage that might occur is identified
- Secondly; appropriate measures taken to eliminate the damage
- Thirdly; if any damage occur it is minimized and controls put in place to avoid a re-occurrence.
- iii) **Potential risk of Acid Mine Drainage.** (Indicate whether or not the mining can result in acid mine drainage).
- No acid mine drainage
- iv) **Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.**
- For this operation it is not required. The description below is given as part of the emergency preparedness on the mine:
- Acid mine drainage (AMD) formation has been widely recognized as one of the major environmental problems caused by mining worldwide, as evidenced by numerous studies.

Minerals responsible for the generation of AMD are iron sulfides (pyrite, FeS_2 , and pyrrhotite, Fe_{1-x}S), which are stable and insoluble while not in contact with water and atmospheric oxygen. Effective AMD management and correction of its impacts can be achieved only if the processes that influence the release and transport of trace metals are known. None of these agents are present or used on the operation.

- v) **Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.**

Preventive and corrective techniques of acid mine drainage

Preventive techniques are those whose objective is to prevent the production of acid effluents from the mine. On the other hand, corrective techniques are designed to treat the acidic waters produced by mining, so that they stop being a threat to the environment.

It is easy to understand that when planning the mine abandonment, priority should be given to suitable preventive techniques. The use of corrective techniques is only justified for the most serious and unforeseen cases of acid water pollution. Therefore, the mine waste treatment must be included in the mining project in order to minimize the exposure of these materials to inclement weather and to reduce the mine waste volume to be processed and stored.

Preventive techniques for acid mine drainage

In mining areas with high concentrations of pollutants, AMD treatment costs can have a significant impact on the economic performance, even to compromise the project viability, so that, AMD formation should be prevented.

Preventive techniques act on any of the three elements that are essential in the formation of acidic waters: oxygen, water and *Thiobacillus ferrooxidans* bacteria.

On the mine the following techniques would be employed where AMD is experienced.

Application of chemicals

Addition of chemicals that interact with the tailings reduces the release of acid, iron and other heavy metals into the reservoir since their solubility decreases as the pH increases ([Fig. 2](#)). There are some accessible and inexpensive alkaline chemicals that can be added to the mining wastes to neutralize the acid pH in the drainage. However, this method does not always prevent the re-acidification after a few years.

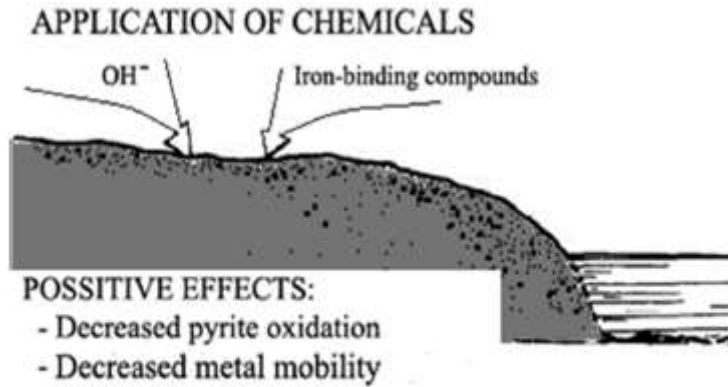


Figure 2. Application of chemicals.
 Source: Ledin and Pedersen, 1996 [27].

Placing a lime layer near the surface allows achieving an alkaline environment which inhibits bacteria proliferation and that neutralizes partly the generated acid. Because of this and its low cost, it has become a common practice in almost all restorations of tailings potentially generating acidic waters.

vi) **Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.**

Corrective techniques for acid mine drainage

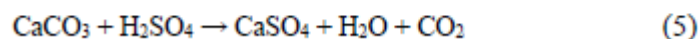
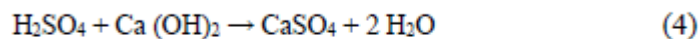
The most prevalent method for treating AMD contamination is the addition of alkaline reagents such as lime, limestone, sodium carbonate or sodium hydroxide. This treatment aims at neutralizing acidic water and the precipitation of heavy metals. However, maintenance requirements are high and large sludge amounts are produced that are mainly composed of calcium sulfate and some metal hydroxides. In an oxidizing environment, limestone is coated with reaction products until it becomes ineffective. This problem is solved by using passive anoxic limestone drains (ALDs), which consist of shallow sealed trenches excavated in the spoil and filled with limestone.

The most used techniques will be described in the next sections.

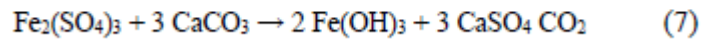
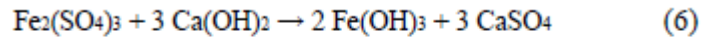
Chemical neutralization plants

In these plants, the water recovery takes place in three phases: neutralization, oxidation and precipitation, as follows [1]:

- Acid neutralization with lime, (Eq. 4) limestone (Eq. 5) or other bases:



- Oxidation from ferrous to ferric in aeration tanks (Eq. 6, 7), the latter being easier to precipitate:



- Precipitation ([Fig. 3](#)).

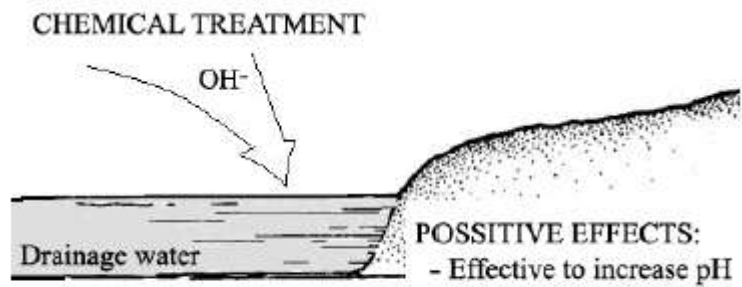


Figure 3. Acid neutralization phase.
Source: Ledin and Pedersen, 1996 [27].

Volumes and rate of water use required for the mining, trenching or bulk sampling operation.

Not known at this stage.

vii) **Has a water use licence has been applied for?**

The Applicant will apply on approval of the EMP_r as required by DWS.

**Impacts to be mitigated in their respective phases.
viii)**

Measures to rehabilitate the environment affected by the undertaking of any listed activity

Plant Site 800m², Workshop 300m², Stockpiles 1500m², Topsoil Storage 500m², Ablution Facilities 25m², Chemical Storage 25m², Diesel Storage 32m², Site Office 25m², Domestic Waste Facility 16m², Roads 400m², Slimes Dam 10000m², Waste Dumps 1000m² Total Footprint 14623m².

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
(as listed in 2.11.1)	of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure.	(volumes, tonnages and hectares or m ²)	(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regards to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Site Establishment	Construction phase	1.4623 ha	Dust suppression by means of water spraying. Rehabilitation, Ripping of compact ground. Seeding with indigenous plant. Speed limits of 30km per hour	Compliance with NEMA, NWA, MPRDA, NEM:WA and the NEMA principles will be done.	1 month
Temporal Roads construction	Construction phase	400m ²	Dust suppression by means of water spraying. Roads will be ripped to a depth of 300mm in order to allow vegetation	Compliance with NEMA, NWA, MPRDA, NEM:WA and the NEMA principles will be done.	1 month

			growth		
Temporal storage of hydrocarb	Operational	25m ²	Demolishing of cement slabs and bund wall during decommissioning phase	Compliance with NEMA, NWA, MPRDA, NEM:WA and the NEMA principles will be done.	During last Phase
Excavations (Bulk Sampling)	Operational phase	1.11ha	<p>Dust suppression by means of water spraying. Dust fall-out buckets.</p> <p>Concurrent rehabilitation will be done by backfilling the trenches. Topsoil will be spread on top to allow plant succession.</p> <p>Site Access restriction Monitoring. Drip trays placed under each stationary equipment. Seeding with indigenous plant. Speed limit of 30km/h. Labelled Waste containers.</p> <p>Vegetation will be protected by avoiding unnecessary clearance and by using existing roads at all times. No poaching allowed. Comply with occupational noise regulations of the Occupational Health and Safety Act, Act 85 of 1993.</p> <p>Provide ear plugs for noise pollution.</p>	Compliance with NEMA, NWA, MPRDA, NEM:WA and the NEMA principles will be done.	Month 3-58
Decommissioning and final rehabilitation	Decommissioning phase	1.4623ha	<p>All infrastructure removed from site Waste will be disposed of at licenced facilities. Any contaminated soils will be cleaned and rehabilitated. All compacted surfaces will be ripped to a depth of 300mm. The successful establishment of</p>	Compliance with NEMA, NWA, MPRDA, NEM:WA and the NEMA principles will be done.	Last Phase

			<p>vegetation is important to ensure the return of animals in the area. if sucseccion does not take place, a seeding programme in consultation with the ecologist should be implemented.</p> <p>Boreholes will be capped and made safe, in agreement with the landowner.</p>		
--	--	--	--	--	--

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ());

<p>ACTIVITY whether listed or not listed.</p> <p>(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).</p>	<p>POTENTIAL IMPACT</p> <p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)</p>	<p>ASPECTS AFFECTED</p>	<p>PHASE In which impact is anticipated</p> <p>(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)</p>	<p>MITIGATION TYPE</p> <p>(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)</p> <p>E.g.</p> <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation.. 	<p>STANDARD TO BE ACHIEVED</p> <p>(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.</p>
Site Establishment	Surface disturbance Air Pollution Topsoil	Fauna and Flora Topography	Construction phase	Dust suppression by means of water spraying. Rehabilitation, Ripping of compact ground. Seeding with indigenous plant. Speed limits of 30km per hour	Compliance with NEMA, NWA, MPRDA, NEM:WA and the NEMA principles will be done.
Temporal Roads construction	Surface disturbance Air Pollution Topsoil	Fauna and Flora Topography	Construction phase	Dust suppression by means of water spraying. Roads will be ripped to a depth of 300mm in order to allow vegetation growth	Compliance with NEMA, NWA, MPRDA, NEM:WA and the NEMA principles will be done.
Temporal storage of hydrocarb	Surface /ground water contamination	Contamination	Operational	Demolishing of cement slabs and bund wall during decommissioning phase	Compliance with NEMA, NWA, MPRDA, NEM:WA and the NEMA principles will be done.
Open Cast Mining	Surface disturbance Air Pollution Noise Surface /ground water contamination	Visual Geology Topography Fauna and Flora Visibility	Operational phase	Dust suppression by means of water spraying. Dust fall-out buckets. Concurrent rehabilitation will be done by backfilling the trenches. Topsoil will be spread on top to allow plant succession.	Compliance with NEMA, NWA, MPRDA, NEM:WA and the NEMA principles will be done.

				<p>Site Access restriction Monitoring. Drip trays placed under each stationary equipment. Seeding with indigenous plant. Speed limit of 30km/h. Labelled Waste containers.</p> <p>Vegetation will be protected by avoiding unnecessary clearance and by using existing roads at all times. No poaching allowed. Comply with occupational noise regulations of the Occupational Health and Safety Act, Act 85 of 1993.</p> <p>Provide ear plugs for noise pollution.</p>	
Decommissioning and final rehabilitation	Decommissioning phase	Visual Geology Topography Fauna and Flora Visibility	<p>All infrastructure removed from site Waste will be disposed of at licenced facilities. Any contaminated soils will be cleaned and rehabilitated. All compacted surfaces will be ripped to a depth of 300mm. The successful establishment of vegetation is important to ensure the return of animals in the area. if sucseccion</p>	<p>Compliance with NEMA, NWA, MPRDA, NEM:WA and the NEMA principles will be done.</p>	Last Phase

			does not take place, a seeding programme in consultation with the ecologist should be implemented. Boreholes will be capped and made safe, in agreement with the landowner.		
--	--	--	---	--	--

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

<p>ACTIVITY whether listed or not listed.</p> <p>(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).</p>	<p>POTENTIAL IMPACT</p> <p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)</p>	<p>MITIGATION TYPE</p> <p>(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)</p> <p>E.g.</p> <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring <p>Remedy through rehabilitation..</p>	<p>TIME PERIOD FOR IMPLEMENTATION</p> <p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required.</p> <p>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-..</p> <p>Upon cessation of the individual activity</p> <p>or.</p> <p>Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>	<p>COMPLIANCE WITH STANDARDS</p> <p>(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)</p>
Site Establishment	Surface disturbance Air Pollution Topsoil	Fauna and Flora Topography	Construction phase	Dust suppression by means of water spraying. Rehabilitation, Ripping of compact ground. Seeding with indigenous plant. Speed limits of 30km per hour
Temporal Roads construction	Surface disturbance Air Pollution Topsoil	Fauna and Flora Topography	Construction phase	Dust suppression by means of water spraying. Roads will be ripped to a depth of 300mm in order to allow vegetation growth
Temporal storage of hydro carb	Surface /ground water contamination	Contamination	Operational	Demolishing of cement slabs and bund wall during decommissioning phase
Excavations (Bulk Sampling)	Surface disturbance Air Pollution	Visual Geology	Operational phase	Dust suppression by means of water spraying.

	Noise Surface /ground water contamination	Topography Fauna and Flora Visibility		<p>Dust fall-out buckets.</p> <p>Concurrent rehabilitation will be done by backfilling the trenches. Topsoil will be spread on top to allow plant succession.</p> <p>Site Access restriction Monitoring. Drip trays placed under each stationary equipment. Seeding with indigenous plant. Speed limit of 30km/h. Labelled Waste containers.</p> <p>Vegetation will be protected by avoiding unnecessary clearance and by using existing roads at all times. No poaching allowed. Comply with occupational noise regulations of the Occupational Health and Safety Act, Act 85 of 1993.</p> <p>Provide ear plugs for noise pollution.</p>
Decommissioning and final rehabilitation	Surface disturbance Air Pollution Noise Surface /ground water contamination	Fauna and Flora Topography	Decommissioning phase	<p>All infrastructure removed from site Waste will be disposed of at licenced facilities. Any contaminated soils will be cleaned and rehabilitated. All compacted surfaces will be ripped to a depth of 300mm. The successful establishment of vegetation is important to ensure the return of animals in the area. if sucseccion does not take place, a seeding programme in</p>

				consultation with the ecologist should be implemented. Boreholes will be capped and made safe, in agreement with the landowner
--	--	--	--	---

i) **Financial Provision**

(1) **Determination of the amount of Financial Provision.**

- (a) **Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22 (2) (d) as described in 2.4 herein.**

Closure Objectives:

- The main objective would be to leave the environment in the same state as before.
- To prevent sterilization of ore reserves.
- To prevent the erection of permanent structures.
- Establish a self-sustainable vegetation growth.
- To limit and rehabilitate any erosion features and prevent any damage to the soil capacity.
- To limit and manage the visual impact.
- Ensure health and safety of all humans and animals that may be affected by the activities.
- The last closure objective is that the operation is closed efficiently, cost effectively and in accordance with government policy.

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

Confirmed by M A Goliath.

- (c) **Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.**

Infrastructure Areas:

On completion of the prospecting operation, the various surfaces, including the access roads, the office area, storage areas, and the screening plant site, will be rehabilitated as follows:

All remaining material on the surface will be removed to the original topsoil level. This material will then be backfilled into the depressions. Any compacted area will then be ripped to a depth of 300mm, where possible the topsoil or growth medium returned and landscaped.

All infrastructure, equipment, screening plant, and other items used during the operational period will be removed from site.

On completion of operations, all buildings, structures or objects on the office site will be dealt with in accordance with Regulation 44 of the Minerals and Petroleum Resources Development Act, 2002, which states:

1. When a prospecting right, mining right, retention permit or prospecting permit lapses, is cancelled or is abandoned or when any prospecting or prospecting operation comes to an end, the holder of such right or permit may not demolish or remove any building, structure or object —

(a) which may not be demolished or removed in terms of any other law;

(b) which has been identified in writing by the Minister for purposes of this section; or

(c) which is to be retained in terms of an agreement between the holder and the owner or occupier of the land, which agreement has been approved by the Minister in writing.

2. The provision of subsection (1) does not apply to bona fide prospecting equipment, which may be removed.

Topsoil and Stockpile Deposits: Disposal facilities

Waste material of all description inclusive of receptacles, scrap, rubble and tyres will be removed entirely from the prospecting area and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on the site.

On-going seepage, control of rain water

No monitoring of ground or surface water will take place, except if so requested by the DWS .

Long term stability and safety

It will be the objective of mine management to ensure the long term stability of all rehabilitated areas including the backfilled depressions. This will be done by the monitoring of all areas until a closure certificated has been issued.

Final rehabilitation in respect of erosion and dust control. Self-sustaining vegetation will result in the control of erosion and dust and no further rehabilitation are planned.

Final rehabilitation roads

After rehabilitation has been completed, all roads will be ripped or ploughed, fertilized and seeded.

Submission of information

Reports on rehabilitation and monitoring will be submitted annually to the Department of Mineral Resources — Northern Cape, as described in Regulation 55.

Maintenance (Aftercare)

Maintenance after closure will mainly concern the regular inspection and monitoring and/or completion of the re-vegetation programme.

The aim of this Environmental Management Plan is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.

The aim with the closure of the mine will be to create an acceptable post-mine environment and land-use. Therefore all agreed commitments will be implemented by Mine Management.

.D. After-effects following closure:

Acid mine drainage

No potential for bad quality leach ate or acid mine drainage development exist after mine closure.

Long term impact on ground water

No after effect on the groundwater yield or quality is expected.

Long-term stability of rehabilitated land

One of the main aims of any rehabilitated ground will be to obtain a self-sustaining and stable end result.

Cleaning of all drill bits material concurrently and replacing of topsoil where available.

Submissions of Information

Reports on rehabilitation and monitoring will be submitted annually to the Department Mineral Resources-Northern Cape, as described in Regulation 55.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The ultimate rehabilitation of the prospecting site involves the sloping, levelling, replacement of topsoil and the seeding of a grass seed mix in areas that does not recover acceptably as agreed to by the landowner will ensure that the site could be regarded as safe for humans and animals and will also ensure that the site is stable from an erosion point of view and also ensuring that the site is available for future use.

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

No	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighing factor 1	Amount Rands
1	Dismantling of processing plant and structures	m ³	800	14.45	1	1	11560
2(A)	Demolition of steel buildings and structures	m ²	300	201.35	1	1	60405
2(B)	Demolition of reinforced concrete buildings and structures	m ²	32	296.72	1	1	9495.04
3	Rehabilitation of access roads 400m ² remain for future use	m ²	400	36.03	1	1	14412
4(A)	Demolition and rehabilitation of electrical railway lines	m		349.71	1	1	
4(B)	Demolition and rehabilitation of non-electrical railway lines	m		190.75	1	1	
5	Demolition of housing and/or administration facilities	m ²	91	402.70	1	1	36645.70
6	Opencast rehabilitation including final voids and ramps	ha	0.05	204951.85	1	1	10247.59
7	Sealing of shafts and inclines	m ³		108.09	1	1	
8(A)	Rehabilitation of overburden and spoils	ha		140732.19	1	1	
8(B)	Rehabilitation of processing waste deposits and evaporation ponds(non-polluting potential)	ha	0	175279.40	1	0.5	87639.70
8(C)	Rehabilitation of processing waste deposits and evaporation ponds(polluting potential)	ha		509094.45	1	1	
9	Rehabilitation of subsided areas	ha		117842.01	1	1	
10	General surface rehabilitation	ha	0.2	111483.63	1	1	22296.73
11	River diversions	ha		111483.63	1	1	
12	Fencing	m		127.17	1	1	
13	Water management	ha	0.01	42389.21	1	1	423.89
14	2 to 3 years of maintenance and after care	ha			1	1	

15(A)	Specialist study	sum	1	14836.22			14836.22
15(B)	Specialist study	sum					
					Subtotal		180322.17
	Preliminary and General				Weighing factor 2		
					1		
	Contingencies	5000		Subtotal	185322.17		
				VAT(15%)	27798.33		
				Grand Total	210120.50		

R 210120.50

(f) Confirm that the financial provision will be provided as determined.

I, J Mabena as Director, confirm that financial provision will be provided as determined.

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

- g) Monitoring of Impact Management Actions
- h) Monitoring and reporting frequency
- i) Responsible persons
- j) Time period for implementing impact management actions
- k) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Topography	To minimise the reduce of land capability	To ensure that rehabilitation post-mining slopes are stable free draining and no slopes have an angle in excess of 20	Site Manager/ Environmentalist	Monitoring will be done on an annual basis to ensure that the levels and the slopes are in order
Soil	To prevent soil pollution; To limit soil compaction; To curb soil erosion; and To reinstate a growth medium able to sustain plant life.	Soil depth and chemical composition will be tested and possible erosion damage will be assisted and rectified	Site Manager/ Environmentalist	Monitoring will be done on an annual basis or after a heavy rain event
Air quality	To control the incidence of unacceptable levels of dust pollution on site	To ensure that the mine minimise dust omission, so that dust does not become a nuisance for affected parties and health hazard	Site Manager/ Foreman appointed SHE Consultant	Visual inspection will be done and managed by dust suppression by a water tanker. Quarterly test will also be conducted by a Health and Environmental Consultant and submitted to Mine Health and Safety for monitoring purposes
Fauna	To minimise vegetation destruction in drill areas, and therefore a habitat for wildlife; and To eliminate poaching and the extermination of animal species	To ensure that the species diversity and abundance is not significantly reduced	Site Manager/ Environmentalist	Monitoring will be done at rehabilitated area on annual basis to investigate species diversity and abundance

	within the boundaries of the study area as well as the surroundings area.			
Flora	To minimise the destruction of vegetation units; and To control invasion of exotic and invasive plant species.	To ensure that the rehabilitated areas become self-maintaining	Site Manager/ Environmentalist	Monitoring will be done at the rehabilitated areas on a twice a year basis (mid- summer and mid- winter). Where species diversity and vegetation cover will be investigated
Noise	To control the incidence of unacceptable noise levels on site	The management objective will be to reduce any level of noise, shock and lightning that may have an effect on persons and animals, both inside the plant and that which may migrate outside the plant area.	Site Manager/ Foreman appointed SHE Consultant	Quarterly reports on fall-out noise monitoring will be conducted as required. If any complaints are received from the public or state departments regarding noise levels the levels will be monitored at prescribed monitoring points
Surface water	To conserve water; and To eliminate the contamination of run-off and source of the water surface	There are no sources in the vicinity of the mine.	Site Manager/ Water supply	No monitoring will be done to monitor the quality of the surface water
Ground water	To minimise and prevent as far as practically possible the contamination of the ground water	No ground water is used	Site Manager/ Water supply	No monitoring will be done to monitor the levels and quality

l) Indicate the frequency of the submission of the performance assessment report.

Quarterly reports on fall-out and nuisance dust and noise monitoring will be conducted and incorporated into the annual reports forwarded to the Principle Inspector of Mine Health and Safety, Northern Cape.

Fauna and Flora will be monitored annually for the Performance Assessment Report.

Annual performance Assessment and financial quantum reports will be conducted

m) Environmental Awareness Plan

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

- An Environmental, Health and Safety induction programme will be provided to all employees prior to commencing work, and they will sign acknowledgement of the induction
- A daily “toolbox talk” will be held prior to commencing work, which will include discussions on health, safety and environmental considerations. The toolbox talks should be led by the Site Manager.

**ENVIROMENTAL AWARENESS TRAINING
PROGRAMME PROCEDURES**

Natural resources are limited and not always renewable and it is the responsibility of management to ensure that all employees are trained to understand that impact of their tasks on the environment and to reduce them wherever possible.

Environmental awareness training must be given to new employees on the site and any contractors who may come onto the site for a short period of time. Refresher training must be given to permanent employees on an annual basis.

The objective of this procedure is to ensure that all employees on the, including contractors, are competent to perform their duties, thereby eliminating negative impacts on their safety, health and the environment

The Environmental topics to be covered in awareness training should include the following:

• **RESOURCE MANAGEMENT**

- (i) The importance of saving water
- (ii) South Africa is a water scares country and rivers are polluted
- (iii) Do not throw litter into river or water drains
- (iv) Do not dispose of oils in sewers

(b) Air pollution- Climate changes

- (i) The use of fossil fuels is increasing the amount of greenhouse gases that are discharge to the atmosphere. Share transport or use public transport
- (ii) Don't burn any rubbish, the smoke pollution the air
- (iii) Plant trees, they clean the air, provide us with oxygen and removed the greenhouse gas carbon dioxide from the air

(c) Soil conservation

- (i) Prevent over gazing of farmlands, keep vegetation on surface on the land to prevent soil erosion
- (ii) Plant trees

• **HAZARDOUS SUBSTANCE USE AND STORAGE**

- a. Solvents, petrol, diesel, insecticides, chlorine, detergents, chemical fertilisers and harmful to the environment and to your health. Use them sparingly and do not let them get into the water system. Containers must be disposed of to a licensed hazardous waste disposal facility.

- b. Hazardous substances must be stored and used correctly
 - c. Ensure that 16 points Material Substances Safety Data Sheets (MSDS) are available at point of store
 - d. Compressed gas storage requirement
 - e. Flammable substances store requirement
- **INCIDENT AND EMERGENCY REPORTING**
 - a. The company must have an emergency/ incident reporting system whereby environmental incidents can be reported and actioned to mitigate and follow up on
 - **OIL/DIESEL/PETROL SPILL CLEAN UP**
 - a. All employees who work with machines and vehicles must be instructed how to prevent and clean up an oil or diesel spill appropriately. Spill kits must be available on site drip trays must be used when servicing vehicles
 - **CONSERVATION OF WATER**
 - a. Campaign to save water on site
 - b. Clean water is expensive and potable water must be used carefully
 - c. Prevent pollution of water by preventing spills and dispose of wastes properly
 - **CONSERVATION OF VEGETATION**

Plants, grasses and trees are very important to our existence on the earth, they provide food, fuel, shelter, raw materials and they clean the air. Indigenous plants are especially important for multi and the whole ecology of life. Human activities are destroying the natural forests of the earth. The natural forests are the "lungs" of the planet and unfortunately they are being cleared faster than they can be regenerated

- a. EIA's are to be done before virgin bush can be cleared
- b. Vegetation cover reduces water and topsoil loss from the ground, do not clear vegetation unnecessarily
- c. Indigenous trees provide shade that attract wild birds
- d. Do not chop down indigenous trees without good reason
- e. Implement a tree planting programme
- f. Remove alien invasion trees in your area such as Prosopis, Syringa and Pepper trees, Cactus plants.

WASTE MANAGEMENT

- a. Employees must be instructed on how to tell the difference between hazardous waste and general waste.
- b. Employees should be trained on how to separate hazardous waste and general waste and where to dispose of these wastes

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

Air Quality:

Control the incidence of unacceptable dust pollution on site.

Surface water:

Conserve water and eliminate the contamination of run-off and sources of surface water.

Ground water:

Minimise and prevent as far as practically possible the contamination of ground water.

Flora:

Minimise the destruction of vegetation.

Control invasion by exotic and invasive plant species.

Fauna:

Minimise the destruction of vegetation and therefore habitat for wildlife; and

Eliminate poaching and the extermination of animal species.

Noise:

Control the incidence of unacceptable noise levels on site.

Aesthetics:

Minimise aesthetics disturbance; and
Reduce the visual impact of the prospecting operation through continuous rehabilitation.

Soils:

Prevent soil pollution.
Limit soil compaction.
Curb soil erosion.
Reinstate a growth medium able to sustain plant life.

Land capability:

Minimise the reduction of land capability.

Sensitive landscapes:

Protect sensitive landscapes from potential negative impacts.

Waste Management:

Demarcated sites for waste.

n) Specific information required by the Competent Authority
(Among others, Confirm that the financial provision will be reviewed annually).

Quarterly reports on fall-out and nuisance dust and noise monitoring will be conducted and incorporated into the annual reports forwarded to the Principle Inspector of Mine Health and Safety, Northern Cape.

Fauna and Flora will be monitored annually for the Performance Assessment Report.
Annual performance Assessment and financial quantum reports will be conducted.

2) UNDERTAKING

The EAP herewith confirms

- a)** the correctness of the information provided in the reports Yes
- b)** the inclusion of comments and inputs from stakeholders and I&APs ; Yes
- c)** the inclusion of inputs and recommendations from the specialist reports where relevant; Yes and
- d)** the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; Yes

-END-

REFERENCES:

South Africa. 2004. National Environmental Management: Biodiversity Act No. 10 of 2004. Pretoria: Government Printer.

ACOCKS, JPH 1998. Veld types of South Africa. 3rd Edition

Hutton Series: Established Series WDH/HBM/MEJ/GHL 05/2001

National Groundwater Quality Monitoring Programme- Department of Water and Sanitation

WORLDWEATHERONLINE.COM

Mine Health and Safety Act (Act 29) of 1996 (As Amended)

National Environmental Management Act, 1998 (Act 107 of 1998) (As Amended)

APPENDIX A Emails from I&A

3/20/2018

(4 unread) - goliathmalcolm@yahoo.com - Yahoo Mail

Find messages, documents, photos or people

Malcolm Home

Compose

Inbox 4
Unread
Starred
Drafts 99
Sent
More

Views Hide
Photos
Documents
Travel
Coupons
Tutorials

Folders Hide
+ New Folder
Nico

Start Download
- View PDF
Merge & Convert files
into PDFs w/
ScanPDFelement

← Back → Archive Move Delete Spam

To: goliathmalcolm@yahoo.com

Vir wie dit mag sangaan

Ek skryf hierdie epos ivm die omgewings impak studie van julle prospektering by Nek en Caintoul. Julle "advertensies" is nie weer bestand nie so ek het geen idee wat daar slaan of aangaan nie dit moet vir 28dae op waes volgens wet en ek kan alreeds nie sien wat gaan vir wat nie so julle moet asb maar weer oor adverteer met weer bestande advertensies.

Tweedens in watter plaaslike koerant het julle hierdie Eia's adverteer ek wil asb 'n afdruk sien vir February of Maart.

Denders waar is julle Eia op die water gebruik want die hay district is alreeds water skaars en kan nie myn aktiwiteite onderhou nie.

Ek verwag terugvoer

Nicola van der Vyver
Boer op Cairntop langs nek en caintoul

Malcolm Goliath <goliathmalcolm@...> Mar 20 at 2:19 PM
To: Wessel Van Der Vyver

Mev/Mej Van der Vyver,

Die Publieke deelname borde in gebruik is getimineer en weerbestaand. Indien daar skade aan die borde is moet dit opsetlik wees. Die verantwoordelike persoon of persone is aan my onbekend. Die proses indertied is vir 30 dae en nie 28. Ek beskou u as n Geïnteresseerde and Geafkteerde persoon.

Die proses vir 'n Prospektereeng is nie so maklik as wat dit op die oog af lyk. Die felt dat daar tans n publieke deelname proses in loop is, verklaar waarom daar nog nie 'n omgewingsimpak studie gedoen is nie, want die proses is vir die "scoping report" waarvan die 44 dae periode nog nie verstreke is nie.

Ek is die aangestelde konsultant en wil graag u insette tot die proses he. Ek het by die eiensars van Nek 106 aangeklop en is verwittig dat ek met hulle prokureur moet skakel wie nie aan my konsultasie gehoor gee nie. Ek het ook verneem dat ek deur 'n persoon "Wikus" moet handel vir toegang to Caintoul.

Ek verneem met graag van u en gaan daarom aan u alle inligting beskikbaar maak soos die proses verloop tensy u deelname weier wat ek glo nie in u belang is nie.

Die "borde" is aangebring onder andere ook by die Biblioteek te Griekwastad. Die Publieke vergadering is geskeduleer vir die 22ste Maart 2018 te skool Karikama.

Ek wil u daarom let dat ek beskou u as spesiaal aangesien die aansoek u direk raak en verkies om met u op persoonlike vlak te deel as u my sou toelaat.

Vriendelike groets
Malcolm Angus Goliath
0824523693

> Show original message

Reply, Reply All or Forward

Malcolm Goliath
goliathmalcolm@yahoo.com
27824523693

Removes 99% including waterpro
Johnso
FACE C

DAILIES T
Multifocal Conto
REGISTER AN
Alcon

Find messages, documents, photos or people

Malcolm

Home

Compose

Back Forward Stop Archive Move Delete Spam

- Inbox** 3
- Unread
- Starred
- Drafts 100
- Sent
- More
- Views** Hide
 - Photos
 - Documents
 - Travel
 - Coupons
 - Tutorials
- Folders** Hide
 - + New Folder
 - Nico

Start Download
View PDF
Merge & Convert files
Use PDFs as
Templates

Register as participant

Yahoo/Inbox

leendert <leendert@webmail.co.za> Mar 19 at 3:03 PM
To: goliathmalcolm@yahoo.com

Good morning
With this letter I, Leendert Dekker Snyman (id: 8012025065084), Director of LD Snyman Boerdery (Pty) Ltd (2016/142282 / 07) and co-owner of Raasob Boerdery Bk (CK98 12986/23), would like to register me as person as well as LD Snyman Boerdery Pty (LTD) and Raasob Boerdery Bk and the farms Sandrige 191 and Park 107 in the District Hay of the Northern Cape on your application database for the application with reference nr. NC 30/1/1/2/12147 PR. Both these farms are situated in the direct vicinity of the farm Nek 107 and Calmtoul 189 for which you have a application NC 30/1/1/2/12147 PR for manganese prospecting. Thereby both these farms and farming businesses will directly be affected by any mining or prospecting activities in the roads used, dust pollution and under ground water supplies. I myself and my family are also living on the mining area and also have some farming practises on the mining area for Nek 107 and Calmtoul 189 and would directly be affected by any mining or prospecting on these premises. It is thus of importance for me and for you to register the above entities, person and farms on your database.

Yours sincere
Leendert Snyman
cell:083 286 8496
leendert@webmail.co.za

Sent from my Samsung Galaxy smartphone

Malcolm Goliath <goliathmalcolm@...> Mar 20 at 2:27 PM
To: leendert

Miss/Mrs Snyman

I kindly appreciate the fact that you wish to participate in the prospecting right application process. It is indeed true that this activity will affect you personally.

I wish to consult with you on a personal basis if agreed. I will be in Griekwastad on the 22nd of March 2018 due to the Public meeting that will be held at 10:00 at Kankama school.

Please note that the Department Mineral Resources has thus far not accepted the application.

Greetings
Malcolm Goliath
0824523693

Show original message

Reply, Reply All or Forward



Leendert
leendert@webmail.co.za

Sony Xperia XZ Premium
+ FREE Sony PS4
+ Sony Xperia L1
R 718 PMv24
+ Smart 5
Upgrade Now

Johnson's
EVEN SKIN TONE IN 4 WEEKS
Johnson's STIVE LANE
* Clinical Assessment (23 weeks) after *

76 100 100 100 100 100 100

APPENDIX B

Email to Municipal Manager

4/8/2018

goliathmalcolm@yahoo.com - Yahoo Mail

Find messages, documents, photos or people

Malcolm

Home

Compose

Back Reply Reply All Archive Move Delete Spam

Inbox

Unread

Starred

Drafts

100

Sent

More

Views

Hide

Photos

Documents

Travel

Coupons

Tutorials

Folders

Hide

+ New Folder

Nico

Quickbooks® Online
Don't Miss These Get Started with the #1 Accounting Solution for a Limited Time

Prospecting Application

Yahoo/Sent



Malcolm Goliath <goliathmalcolm>
To: mm@siyancuma.co.za

Mar 14 at 7:59 PM

Mr Papier,

Herewith the Background Information Document for a prospecting right application lodged with the DMR, Northern Cape Region on the farms Nek 106 and Calmbouls.

Kindly forward any input to this email adress.

Regards

Malcolm Goliath
Consultant/EAP
0824523683



Hard Rock Bl...pdf
393.5kb

Reply Reply All More

To: mm@siyancuma.co.za

cc /bcc



Malcolm Goliath
goliathmalcolm@yahoo.com
27824523683

TU Delft



Helicopters Online Course

Master Aerodynamic and Dynamic Characteristics of Helicopters.

Helicopter Performance - Stability and Control
Master Aerodynamic and Dynamic Characteristics of Helicopters.

online-learning.tudelft.nl

Show Original Message

Sent



APPENDIX C
Minutes of Public Meeting held on the 22nd March 2018.

M A GOLIATH
23 GOEDEHOOP AVENUE
ROYLDENE
KIMBERLEY
8301

EMAIL: goliathmalcolm@yahoo.com
CELL: 0824523693

MINUTES OF PUBLIC MEETING

DATE: 22nd March 2018
PLACE: KARIKAMA SECONDARY SCHOOL, GRIEKWASTAD
TIME: 10:00
CHAIRPERSON: M A GOLIATH
PRESENT: AS PER ATTENDANCE REGISTER

AGENDA
As per minutes

1. DISCUSSION OF PUBLIC PARTICIPATION PROCESS

The Chairperson welcomed all to the meeting and thanked them for taking time to participate in this important process. The chairperson explained the purpose and reason for the public participation process and the legislative context with reference to the MINERAL AND PETROLEUM RESOURCES DEVELOPMENT AND NEMA ACTS. He further explained that Hard Rock MN2 Exploration and Mining Company lodged an application with the Department Mineral Resources for a manganese prospecting right on the farms, Nek 106, Portion 1 Cairntoul 189 and Remainder/Extent Cairntoul 189.

2. SITE VISIT AND ENVIRONMENTAL ASSESSMENT

Mr Goliath explained that at the date of the meeting he had no access to the application farms except for during his two previous visits to the application area he had an opportunity to assess some of the vegetation (fauna and flora), soil types, topography and geology observed from the fence from the study area. He explained that the reason for not gaining access was due to the farm owner not present. The Chairperson explained that the application is at the Public Participation stage for inclusion in the SCOPING REPORT. He expect to submit the scoping report to the DMR on the 8th April 2018. Copies of the scoping report would be forwarded to those who request same. The community members chose two members that all communication regarding this application must be forwarded to. He explained that the application has not been yet been accepted by the DMR and that it would take a substantial time if the application is successful, for the prospecting right to be granted.

3. PROSPECTING WORK PROGRAM AND SITE INFRASTRUCTURE

A discussion followed on the prospecting program with particular reference to drilling and bulk sampling which would form part of the prospecting right programme. He further explained the infrastructure that would be erected e.g site office, ablution facilities, roads etc. required for the prospecting activities.

Mr Snyman whom is a farmer in close proximity of the application area raised serious concerns around the use of water for any mining activity. He expressed that the no surface water is available and that the ground water level is not sufficient to sustain the current farming activities.

Discussion followed on the availability of water and the following concerns was raised by some of the Griekwastad community members.

Mr O Williams raised that this is the first time that he heard complaints from the farmers around the availability of water as it seems that the farmers deliberately wish to complaint and object to any mining development as to ensure that the broader community of Griekwastad do not the necessary employment.

His argument was strongly supported by members community members Mr Petrus Mouers and Lucas Waterboer.

Mr Goliath responded that the water concern can be addressed through different avenues but it would take that the farm owners, community members and the studies that need to be conducted could resolve the issues at hand.

Issues relating to another right holder, Lime Chem, was found to be beyond the scope of the meeting and therefor excluded as part of the meeting.

4. FUTURE ENGAGEMENT WITH INTERESTED AND AFFECTED PARTIES

Mr Goliath (Consultant) agreed to forward the application documents to the indicated members that attended the meeting for their further input and response.

5. CLOSURE




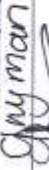












Mr Goliath thanked all participants and attendees to the meeting.

The meeting adjourned at 11:10



M A Goliath
EAP/CONSULTANT

**ATTENDANCE REGISTER
EIA PUBLIC PARTICIPATION MEETING -222ND MARCH 2018**

NAME	CONTACT NUMBER/EMAIL ADDRESS	SIGNATURE
AWA. Maritz.	mantzwaan@ymail.com.	
L.D. Snyman	leendert@wipbmail.co.za	
R.P. van Wyk	rienvuz@tantic.net	
Wm. J. Uys	Kryntap@gmail.com	
C Snyman	hunt@snymansafaris.co.za	
W Snyman	hunt@snymansafaris.co.za	
		
Luna Nel	0711654362	
G. Strydom	215 Barends TR	
R. MERIKI	062 6575884	
Eva Willems	071 9694161	
Muriel Rosi	071 6001662	
Auna Louw	082 3375637	
Esmeralda Froniers	0788465185	
Suzan Block	0799699695	
Jarabe Mmusi	064 2737 817	
Maggie Jack	076 6416 134	
Phanyiswa	0736949193	
Gertruida Basson	07369302	
Lucas Waterboer	0737738449	

* e-mail address: waterboerlucas@gmail.com

APPENDIX D
BID document
HARD ROCK EXPLORATION MN2 (PTY) LTD

SCOPING AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT PROCESS FOR A PROSPECTING RIGHT APPLICATION, LOCATED IN THE DISTRICT OF HAY, NORTHERN CAPE PROVINCE

BACKGROUND INFORMATION DOCUMENT

INTRODUCTION

HARDROCK EXPLORATION MN2 (PTY) LTD “HARD ROCK” has lodged an application for a prospecting right for Manganese with the Department Mineral Resources, Northern Cape, DMR Reference NC 30/5/1/1/2/12147 PR during February 2018.

The application is on the following properties:

- (1) Nek 106
- (2) Portion 1 Cairntoul 189
- (3) Remainder/ extent Cairntoul 189

LOCALITY AND APPLICATION MAP

The Background Information Document (BID) provides Interested and Affected Parties (I&As) with information on the Scoping and Environmental Impact Assessment Report and Environmental Management Programme Report Process for a Prospecting Right Application that Hard Rock Exploration MN2 (PTY) LTD lodged with the Department of Mineral Resources, Northern Cape Region.

I&As are invited to make use of the opportunity to:

- ❖ Register as a stakeholder in the public participation process; and
- ❖ Comment on the Draft Scoping Report , Prospecting Work Program, Environmental Impact Assessment Report and Environmental Management Programme Report .

INVITATION

You will be included in the stakeholder database and receive further documents for comment and input. Your comments will ensure that relevant issues are incorporated into the final documents for approval by the DMR.

All documents will be available on request from:

Project Consultant
 M A Goliath
 23 Goedehoop Avenue, Royldene, Kimberley, 8301
 E-Mail: goliathmalcolm@yahoo.com
 Cell :0824523693

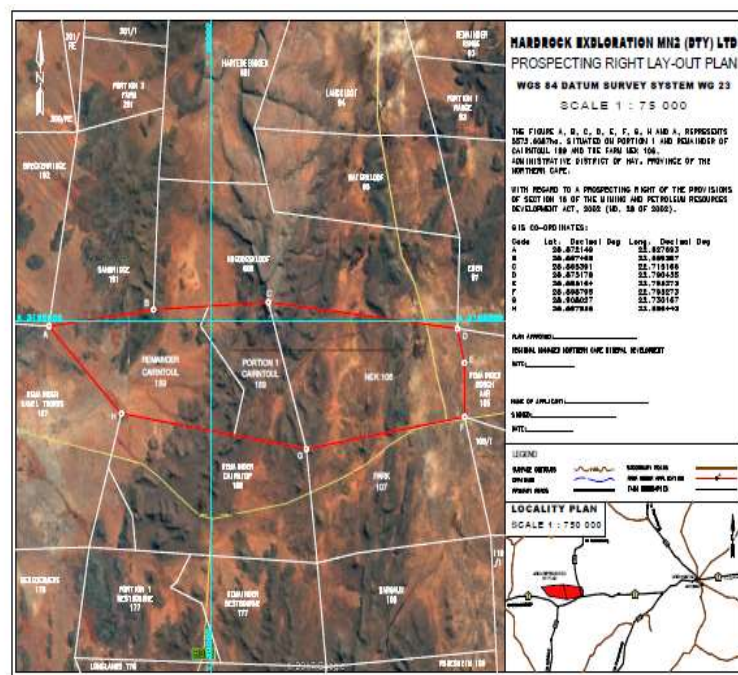
PROJECT DESCRIPTION

PROSPECTING

- Geological Investigation (Completed)
- Geological Mapping (Completed)
- Geological Report (Completed)

Bulk Sampling

The scope of work will comprise of opencast bulk sampling operations, the processing of old dump material.



LEGISLATIVE CONTEXT

COMPLIANCE TO: Mineral and Petroleum Resources Development Act, (Act 28 of 2002) (As Amended) and the National Environmental Management Act, (Act 107 of 1998) (As Amended)
HARD ROCK lodged an application for a Prospecting Right with the DMR, Northern Cape Region.

The final scoping report that will incorporate inputs from all stakeholders will be submitted to the DMR latest 28 March 2018.

The final process of the application is the compilation of the Environmental Impact Assessment Report and Environmental Management Program Report that will be submitted upon receiving approval of the Scoping Report from DMR or, within 106 days from the lodging of the application with the DMR.

POTENTIAL IMPACTS OF THE PROSPECTING ACTIVITIES

The following impacts can possible be expected that the Prospecting Operations will act on (POSITIVE AND NEGATIVE):

- ❖ Fauna and Flora
- ❖ Surface and Groundwater
- ❖ Traffic
- ❖ Geology and Soils
- ❖ Traffic
- ❖ Social
- ❖ Blasting and Vibrations

PLEASE REGISTER TO RECEIVE ALL APPLICATION DOCUMENTATION BEFORE 15 MARCH 2018

PUBLIC PARTICIPATION ENQUIRIES AND REGISTRATION

**M A Goliath
23 Goedehoop Avenue
Royldene
Kimberley
8301**

**E:Mail: goliathmalcolm@yahoo.com
Cell: 0824523693**

REGISTRATION AND COMMENT SHEET

**PROPOSED MANGANESE PROSPECTING OPERATIONS AT NEK 106, PORTION 1
CAIRNTOUL 189 AND REMAINDER EXTENT CAIRNTOUL 189, MAGISTERIAL
DISTRICT OF HAY, NORTHERN CAPE PROVINCE.**

INSERTED IN THE BID DOCUMENT

ORGANISATION :

NAMES :

:

E-MAIL :

POSTAL ADDRESS:

.....

TELEPHONE NUMBER

❖ **PLEASE FORMALLY REGISTER ME AS AN INTERESTED AND AFFECTED PARTY**

I WOULD LIKE TO RECEIVE A COPY OF:

- | | Email | Hard |
|---|--------------------------|--------------------------|
| ❖ ENVIRONMENTAL AUTHORISATION | <input type="checkbox"/> | <input type="checkbox"/> |
| ❖ DRAFT SCOPING REPORT | <input type="checkbox"/> | <input type="checkbox"/> |
| ❖ PROSPECTING WORKING PROGRAM | <input type="checkbox"/> | <input type="checkbox"/> |
| ❖ ENVIRONMENTAL IMPACT ASSESSMENT REPORT
AND ENVIRONMENTAL MANAGEMENT PROGRAM REPORT | <input type="checkbox"/> | <input type="checkbox"/> |

COMMENTS (please attach additional sheets if required)

I suggest that the following issues of concern be investigated in the ENVIRONMENTAL ASSESSEMENT processes:

.....
.....
.....
.....

Any other comments:

.....
.....