

mineral resources

Department: Mineral Resources REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

IN ACCORDANCE WITH APPENDIX 2

NAME OF APPLICANT: AFRO-WITS GOLD AND DIAMOND COMPANY (PTY) LTD 1. DETAILS OF THE APPLICANT

Project applicant:	AFRO-WITS GOLD AND DIAMON	D COMPANY (PTY) LTD
Registration no (if	1964/004255/07		
any):			
Trading name (if any):	AFRO-WITS GOLD AND DIAMON	D COMPANY (PTY) LTD
Responsible Person,	Director		
(e.g. Director, CEO, etc) .:			
Contact person:	Martin Westerman		
Physical address:	58 THE FOUNTAINS LOMBARDY ESTATE , GRAME ROAD , SHERE,		
	PRETORIA EAST 0081		
Postal address:	58 THE FOUNTAINS LOMBARDY	ESTATE , GRA	AME ROAD ,SHERE,
	PRETORIA EAST 0081		
Postal code:	0081	Cell:	+ 27 76 680 3298
Telephone:	+ 27 76 680 3298	Fax:	martinw@iafrica.com
E-mail:	martinw@iafrica.com		

2. (I) ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) INFORMATION

EAP:	M A Goliath		
Contact person (if different from EAP):			
Company:	BNL Nake Trading (PTY) LTD		
Physical address:	23 Goedehoop Avenue, Royldene,	Kimberley	
Postal address:	23 Goedehoop Avenue, Royldene,	Kimberley	
Postal code:	8301	Cell:	0824523693
Telephone:	0824523693	Fax:	goliathmalcolm@yahoo
E-mail:	goliathmalcolm@yahoo.com		.com

CURRICULUM VITAE M A GOLIATH

ITEM	DETAILS	
Name	Malcolm Angus Goliath	
Qualification/s	NHD-Metalliferous Mining Mine Managers Certificate of Competency LSTD(Science, Geology and Botany) Basic Gravimetric Sampling	
Experience	CONSULTANT MINING 2007-Present Responsibilities Develop: Mine Design inclusive of calculation of mine resource Mining Work Programme Financial Model Environmental Management Plan/Programme Social and Labour Plan Annual Reporting-Performance Assessment Report 1999 – 2006 Managing Director-Sedibeng Mining Mine Manger Responsibilities Reporting to the Board of Directors. Manage all Mining disciplines Implement Mining Work Programme Financial and Technical ability Maintain Environmental Management Plan/Programme Social and Labour Plan Prospecting Work Programme Pre-1998 Regional Co-ordinator Minerals and Policy Centre. Inspector of Mines-DME Northern Cape De Beers Consolidated Mines-Finsch Mine Mining Shiftboss	
	Secondary Teacher	
RELATING TO APPLICATION	And Energy Policy Centre Mining Permit Applications Small- Scale Mining Consultant Prospecting Right Applications Mining Right Applications	

(b) (i) and (ii) LOCATION

Farm Name: Application area (Ha) Magisterial district:	 (1) Wynandsfontein 53 extent 770.8788 Ha (2) Le Souvenir 1548 Portion 0 Remainder extent 899.3586 Ha (3) Le Souvenir 1548 Portion 1 extent 899.3586 Ha 2569.596 ha Theunissen
Distance and direction from nearest town	15,6 km South West of Theunissen in the Free State Province
21 digit Surveyor General Code for each farm portion	 Wynandsfontein 53 extent 770.8788 Ha F0330000000005300001 Le Souvenir 1548 Portion 0 Remainder extent 899.3586 Ha F042000000000154800000 Le Souvenir 1548 Portion 1 extent 899.3586 Ha F042000000000154800001
Locality map	Included Below
Description of the overall activity. (Indicate Mining Right, Mining Permit, Prospecting right, Bulk Sampling, Production Right, Exploration Right, Reconnaisance permit, Technical co-operation permit, Additional listed activity)	Prospecting Right Reverse circulation drilling will be employed and a low impact bulk sampling programme to determine the quantity, quality and value of the diamonds.

(c) LOCALITY MAP



APPLICATION MAP



(d) SCOPE OF PROPOSED ACTIVITY

(i) and (ii)

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, etcetcetc.)	Aerial extent of the Activity Ha or m ²	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	2569.596 ha lodged for the surveyed portion only.	X	GNR 327 LN 1, Activity 20

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				
The removal and disposal of	2569.596 ha lodged	X	GNR 325	
minerals contemplated in terms	for the surveyed		Listed 2,Activity	
Petroleum Resources	portion only.		19	
Development Act, 2002 (Act No.				
28 of 2002), including-				
(a) associated infrastructure, structures				
and earthworks, directly related to				
(b) the primary processing of a				
mineral resource including winning,				
extraction, classifying, concentrating,				
crushing, screening or washing: but				
a mineral resource, including the				
smelting, beneficiation, reduction,				
refining, calcining or gasification of				
the mineral resource in which case				
(Activity 19 of Listing Notice 2)				
Activity 27 of GNR 983	1.4623 ha	Х	GNR 327	
The clearance of an area of 1			LN 1 Activity 27	
hectares or more, but less than				
vegetation except where such clearance				
of indigenous				
vegetation is				
(i) the undertaking of a linear activity: or				
(i) the undertaking of a linear activity, of (ii) maintenance purposes				
undertaken in accordance with a				
maintenance management plan.				
Plant Site	800m ²	v	CNP 325	
	00011	^	Listed 2.Activity	
			19	
Workshop	300 m ²	Х	GNR 327	
	2	N N	Ln 1, Activity 20	
Production Stockpiles	1 5 0 0 6			
	1500m ²	^	Ln 1 Activity 20	
Topsoil Storage	1500m ²	× X	Ln 1, Activity 20 GNR 327	
Topsoil Storage	1500m ²	X X	Ln 1, Activity 20 GNR 327 Ln 1, Activity 20	
Topsoil Storage Ablution Facilities	1500m ² 500m ² 25m ²	× × ×	Ln 1, Activity 20 GNR 327 Ln 1, Activity 20 GNR 327	
Topsoil Storage Ablution Facilities	1500m ² 500m ² 25m ²	× × ×	Ln 1, Activity 20 GNR 327 Ln 1, Activity 20 GNR 327 Ln 1, Activity 20	
Topsoil Storage Ablution Facilities Chemical Storage	1500m ² 500m ² 25m ² 25m ²	x x x x	Ln 1, Activity 20 GNR 327 Ln 1, Activity 20 GNR 327 Ln 1, Activity 20 GNR 327 Ln 1, Activity 20	
Topsoil Storage Ablution Facilities Chemical Storage Diesel Storage	1500m ² 500m ² 25m ² 25m ² 32m ²	X X X X X	Ln 1, Activity 20 GNR 327 Ln 1, Activity 20 GNR 327 Ln 1, Activity 20 GNR 327 Ln 1, Activity 20 GNR 327	
Topsoil Storage Ablution Facilities Chemical Storage Diesel Storage	1500m ² 500m ² 25m ² 25m ² 32m ²	X X X X X	Ln 1, Activity 20 GNR 327 Ln 1, Activity 20	
Topsoil Storage Ablution Facilities Chemical Storage Diesel Storage Site Office	1500m ² 500m ² 25m ² 25m ² 32m ² 25m ²	X X X X X X	Ln 1, Activity 20 GNR 327 Ln 1, Activity 20 GNR 327	

Domestic Waste Facility	16m ²	X	GNR 327
			Ln 1, Activity 20
Mine Roads and Access Roads	400m ²	X	GNR 327
			Ln 1, Activity 20
Slimes Dam	10000m ²	X	GNR 327
			Ln 1, Activity 20
Waste Dumps	1000m ²	X	GNR 327
-			Ln 1, Activity 20

(e)

LEGISLATIVE AND POLICY CONTEXT

Policy and Legislative Context

APPLICABLE LEGISLATION AND	REFERENCE WHERE	HOW DOES THIS DEVELOPMENT
GUIDELINES USED TO COMPILE	APPLIED	COMPLY WITH AND RESPOND TO
(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);	(i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	THE POLICY AND LEGISLATIVE CONTEXT (E.g In terms of the National Water Act:- Water Use Liscence has/has not been applied for).
Mineral and Petroleum Resource Development Act; 2002 (Act No.28 of 2002)(As Amended)	A Prospecting Right application	A Prospecting Right application has been lodged with the DMR Free State Province
Mineral and Petroleum Resource Development Act; 2002 (Act No.28 of 2002)(As Amended)	A Prospecting Right Environmental Authorisation	In the process at DMR
National Environmental Management Act, 1998(Act 107 of1998) (As Amended)	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.	Part of Environmental Management Programme

National Environmental Management Act, 1998 (Act 107 of1998) (As Amended) Environmental Impact Assessment Regulations,2014(G38282- 2982-985)	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 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.	In the process at DMR
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 (Act36 of 1998)	In terms of the definitions contained in Section 1 of the National Water Act, Act No.36of 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 though 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 recourse 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 recourse 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.	In the process at DWS

	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.	
World Heritages Convention Act, 1999 (Act 49 of 1999)	Protection of World Heritage Resources	Take note
Environmental Conservation Amendment Act, 2003 (Act 50 of 2003) G26023	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.	This is also legislated by Mine Health and Safety from DMR and will be adhered to.
National Environmental Management Act: Protected Areas Act, 2003 (Act 57 of 2003)	To provide for the management, conservation of protected areas of ecologically viable (natural landscapes and seascapes) areas in South Africa.	Take note
In terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999)	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.	Consult SAHRA
Conservation of Agricultural Resources Act, Act No 43 of 1983	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.	Take note
National Forest Act, 190 (Act No. 84 of 1998)	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	Take note

	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 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	
Subdivision of Agricultural	Control the subdivision, and in	Take note
Land Act, Act 70 of 1970	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.	
Section 17 of the Fencing Act, Act No.31 of 1983	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.	Take note
Section 8 of the Atmospheric Pollution Prevention Act, Act No.45 of 1965	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.	Comply
The Occupational Health and Safety act, Act 85 of 1993 GNR 22810f 1987- 10-16	Environmental Regulations for Workplaces are applicable.	Comply
The South African Civil Aviation Regulation Act, Act 13 of 2009.	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.	Take note

(f) NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

Desirability of the Project:

- Creation of employment opportunities to the Theunissen 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
- o 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) DESCRIPTION OF PROSPECTING ACTIVITIES

Prospecting will be carried out in the following manners:

Mineral: Diamonds

Methodology and Technology

Geological Investigation (month1)

A first phase of geological investigations comprises of collecting various geological literature relating to the area of interest. This literature may be obtained from relevant books and journals. Information can also be inquired from companies which have previously mined in the area. Satellite images as well as geological maps will be used to identify possible mining target areas.

Geological Mapping (month 2)

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

Geological Report (months 3-50)

This written report comprises of all prospecting results as well as recommendations for future activities. When the prospecting period is done a decision will be made to apply for a mining right.

The above phases has been done with previous mining and prospecting activities. A verification and interrogation of the data available has been completed.

Bulk Sampling(month 3-34)

The Bulk sampling programme can be descriped two fold:

Treatment of Historically Mined Dumps

The prospecting area has dump sources that was previuosly mined. These dumps can be treated through a rotary pan plant.

• Virgin Pitting

Bulk sampling is done by using machinery as well as labour. Excavators are used to remove the overburden as well as ore. The dimensions of the excavations is 30m X30m at planned intervals of 280 m in a checkered pattern on the fissure . 3 Pits is planned with an average depth of 20m. 1 Pit would be the old Lovedale mine of which a photo was take as Photo1-Lovedale mine below. 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 Plant Receiving Bin by means of a Load Haul Dumper. The oversize material (+100mm) is used as 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.

A particular target area would be the previuos Lovedale mine of which the depth is between 55m and 650m. During the prospecting phase the maximum depth of prospecting would be 90m.



Photo 1-Old Lovedale Mine

The ore is treated in a processing plant that consists of rotary pans. These pans operate on the principle of density of which the medium is puddle. The concentrate will report to a recovery house, and the diamnonds recovered through grease tables.

Trenching

5 Trenches of dimension 100m x 5m would be made to further quantify the extent of the fissure orebody. The ore from the trenches would be treated to determine the grade of the Burn fissure

(i) ALTERNATIVES CONSIDERED

The Kimberlitic 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. It is also required to have the processing plant as close as possible to the bulk sampling pits, in this case the old Lovedale Mine, 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 rotary pan and grease table processing arrangement that is an acceptable practise in the South African mining fraternity mainly due to the following reasons:

- Employment of a rotary pan that uses puddle as medium that is not harmful to the environment and is efficient and affective for the determination of the resource grades during bulk sampling.
- Use can be made of a mobile plant which is easily moveable and requires no permanent structures to be erected.

The alternative considered to the Rotary Pan Plant was a DMS plant with the employment of ferrosilicon as density medium. This recovery unit could be used in conjunction with a rotary pan but requires a permanent structure and the operational cost is much higher for the current purpose of bulk sampling.

(ii) PUBLIC PARTICIPATION PROCESS

CONSULTATION WITH FARM OWNERS:

FARM	OWNER	CONCERNS RAISED	CONTACT DETAILS
(Neighbour and access point to all application farms)	Mr Thomas Uys	Due to access to other farms: Security and gate control. Theft.	0762552296
Wynandsfontein 53 Le Souvenir 1548 Portion 0 Remainder	In estate: Consult with Mr Andre and Frits Bezuidenhout	Security and gate control concerns. Theft of game. Rehabilitation concern due to past experience.	0836316284
Le Souvenir 1548 Portion 1	Mr Dries Oosthuizen	Security control.	0825677114

Consultations were done by email, telephonic conversations and all parties met personally. The proof of the consultations is attached as APPENDIX A at the end of the document.

ADVERTISEMENT

An advertisement for the public meeting were be placed in the Volksblad on Monday 7 March 2018 and a meeting scheduled at the Theunissen Town Hall for 10:00 am on 16 March 2018 at the . See Appendix B for clearer copy.



PUBLIC NOTICE BOARDS

Public Notice Board of dimensions 60cmX42cm was placed on the farm entry. All farms are only accessible from one entry point.





MASILONYANA MUNICIPAL NOTICE BOARD



MASILONYANA LIBRARY



PUBLIC MEETING

A Public meeting was scheduled on 16 March 2018 at the Town Hall, Theunissen at 10:00. No Interested and Affected Party attended and confirmation thereof is by two officials who signed a confirmation. Proof is attached as Appendix C.

CONSULTATION WITH MUNICIPALITY

e@mail forwarded to the Municipal Manager

Please find proof as Appendix D

GOVERNMENT DEPARTMENTS

Registered letters send to: Land Restitution Agriculture & Rural Development Tourism, Environment and Economic Affairs

Certificate of Posting Inleweringsbewys va	n 'n Versekerde Pakket
Insured value R c Versekerde waarde	Addressee/Geadresserde: Gustomer corr sources
Insurance fee Versekeringsgeld	hopt of Tourism Envir 2018-03-07
Received by Ontvang deur	34 Mortgradt Street Deturner
ALBION PRESS (021) 511-2244	781277
Certificate of Posting Inleweringsbewys va	in 'n Versekerde Pakket
Insured value R c Versekerde waarde	Addressee/Gesdresseerde:
Insurance fee	Land Restitution 20(8-03-0)
Received by Ontvang deur	Blocm BOD Mart
ALBION PREES (021) #11-3244	
Certificate of Posting Inleweringsbewys va	of an Insured Parcel n 'n Versekerde Pakket
Insured value R c Versekerde waarde	Addressee/Geadresseerde: Director Date-stamp
Insurance fee.	Dept of Agric 2008-03-07
Received by Ontvang deur	Bloen 9360.

ALBION PRESS (021) 811-2244

HERITAGE

To be Included in the EIR and EMPr

INTERESTED AND AFFECTED PARTIES

(iii) SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

I&A	ISSUES RAISED	INCORPORATION INTO SCOPING REPORT
None Registered		

(iv) RECEIVING ENVIRONMENT

GEOLOGY AND GEOGHRAPHY GEOLOGICAL INFORMATION



The eastern and central area of the Free State Province is underlain by a base of the Proterozoic/Achaean Witerwaterrand Super group auriferous clastic sediments with minor volcanic (2300-2800 Ma) and Venrersdorp Super group volcanic lavas with minor epiclastics and sediments (2200-2600Ma.) This base is overlain by flat-lying Paleozoic rocks of the Karoo Super group as shown on the geological map below. Permian Dwyka and Ecca group tillites, shales and sandstone (2200-240Ma) form the base of the successions.

In turn are overlain by arenaceous continental sediments of the Beaufort Group grey sandstones with green and purple mudstones and carbonaceous shale's (225-210 Ma) and the Stromberg group of small volcanic vents ,massive sandstone/siltstones beds, which grade into depth into brown and red mudstone and siltstones with dark mudstones at the base. The sedimentary rocks are capped by an accumulation of Cretaceous amygdaloidal dolerite (basalt) flows up to 1,700 meters thickness belonging to the Drakensberg Group(190-135Ma).Feeder dykes and sills of the dolerite are common underlying 1,000 meters of sediments. In the way Virginia-Theunissen are most of thick dolerite mass has been erode away.

Kimberlites, mostly diamondinferous, represents the final Cretaceous phase (135-65MA) of igneous activity in the region. Several parallel to near parallel kimberlite zones stretch for kilometers mainly west northwest and north north north east trending structures.

Kimberlites of the Virginia –Theunissen field are group2 which are presently only know from South Africa, they are older (200-110 Ma) than the internationally common Group 1 kimberlites (100Ma). The group 2 kimberlites consist primarily of rounded olivine macrococyysts, and microphenocrysts of phlogopite and diopside, togheter with spinel, pervoskite and calcite. Group 1 1 and 2 kimberlites have similar magnetic style in

diatremes and hypabyssal facies are know. The bulk of Group 2 deposits in the area occur however as thin 2-3 meters wide hypabyssal dykes(also Referred to as fissures)extending for several kilometers.



Model of a Kimberlite Pipe



Field & Scott Smith 1998

Typicall,several sub-parallel or en-echelon dykes comprise each occurance. The diamond grades in the Group 2 dykes are often higher than in pipes, and can reach 100-200 carats per hundred ton of kimberlite (cpht) in the area. However, diamond distribution within group 2 dykes is erratic and unppredicatable. Many dykes are multiple with each phase having different diamond content. They meander and split into smaller veins or pinch out entirely often re-establishing themselves nearby or unpredictable locations, both horizontally and vertically.

The narrowness of the dykes require extensive in-ore exploration by development based on geophysical and geochemical surveys as well as on limited delineated drilling. Mining is usually carried out with this strict control of dilution and the use of labour intensive mining nethods, wich should be possible to mechanize to some extent for safer and more efficient production.

The Karoo Super Group Start on the Property have a thickness of about 650 meters. It rests unconformable on the Proterozoic Ventersdorp Lavas and is locally intruded by later dolerite(basalt) dykes and sills. A dolerites sill cuts through the shale and sandstones from surface dips to the east of the property.

GEOGRAPHICAL ENVIRONMENT

The landscape surrounding the proposed prospecting area consists of relatively flat, open plains. The landscape is flat to gently undulating, at an altitude of 1430m above mean sea level. The south-eastern corner of the Farm Le Souvenir 1548 Portion 1 (outside the study area) reaches the foorhill of the Leeukop Mountain at a level of 1490 m above mean sea level.

CLIMATIC CONDITIONS

This climate type occurs primarily on the periphery of the true deserts in low-latitude semiarid steppe regions. It is transitional to the tropical wet-dry climate on the equatorward side and to the mediterranean climate on its poleward margin, with a cooler, wetter winter resulting from the higher latitude and mid-latitude frontal cyclone activity. Annual precipitation totals are greater than in tropical and subtropical desert climates. Yearly variations in amount are not as extreme as in the true deserts but are nevertheless large.

Elevation: 1406 meters Latitude: 28 25S Longitude: 026 42E Köppen Classification: Tropical and Subtropical Steppe Climate

Theunissen = Max, Min and Average Temperature (°c) Zoom 1m 3m 6m YTD 14 All + 30°c Max Temp (°c): 20 20:0 Avg Temp (°c): 16 + 10°c Min Temp (°c): 8 0°c Nov '16 lan '17 Mar '17 May 2017 Jul '17 Sep '17 Nov '17 2010 201 201 201 4 Max Temp (°c) - Min Temp (°c) - Avg Temp (°c) WorldWeatherOnline.com

MAX, MIN AND AVERAGE TEMPERATURE

RAINFALL

Zoom 1m 3m 6m YTD 1y All

Theunissen

Average Rainfall Amount (mm) and Rainy Days



Average Snowfall Amount (cm) and Snow Days

						0.cm
	• Da	tys: O				- Com
Nov '16	Jan '17	Mar 2177	May '17	Jul'17	Sep '17	Nov '17
	2010	2012	20)14	2016	
4						III •
		Sr	now (cm) 🛛 Da	ays		

WorldWeatherOnline.com

Ξ

Theunissen

Average and Max Wind Speed and Gust (mph)



WorldWeatherOnline.com

Ξ



Theunissen

Average Cloud and Humidity (%)

UV INDEX

Theunissen

Average UV Index



WorldWeatherOnline.com

≡

≡

Theunissen

Average Sun Hours and Sun Days



VISIBILITY

Theunissen

Average Visibility (miles)



WorldWeatherOnline.com

≡

≡





Hutton form soils occur in the study area and consists of shallow, rocky, gravely and sandy soils with occasional calcrete nodule derived from weathering of kimberlite outcrops.

Surface outcrops is sparse, consisting of shale and sandstone of the Beaufort Group of the Karoo Supergroup, as well as calcrete above the kimberlitic fissures and dolerite sills. The general area is characterized by mesa-type hills typical of the Karoo Supergroup.

SOIL DEPTHS

The Field survey of the soils at revealed that mostly shallow soils with an average depth of approximately 300mm and 600mm deep

NATURAL VEGETATION OCCURING ON THE STUDY AREA



Photo: From Wynandsfontein



Photo: Area around Lovedale Mine - Old Dumps in forefront



Photo: From Le Souvenir

Adcocks (1988) describes the study area as "Dry Cymbopogon-Thcmcda Veld" (No.A50) whereas Low and Rebelo (1996) describe the vegetation in the study area as "Dry, Sandy Hihgveld Grassland (No. 37). This is a dry grassland area with few Acacia karroo (Sweet Thorn) trees. Trees and schrubs noted on site include Rhus lancea (Karee), Ehretia rigida (Puzzlebush), Zipihus mucronata (Wag-'n-bietjie), Protoasparagus lacrinus and P.suaveolens (wils asparagus bush).

Diagnostic grasses include Cymbogon plurinodis (narrow-leafed turpentine grass), Eragrotis lehmanniana (Lehmann's Lovegrass), E. obtuse, Panicum coloratum (Snall Bufflograss) and Stipagrrositis uniplumis (Silky Bushman grass). Other prominent grass species include Themeda trianddra (Redgrass), Eragrositis curvula (Weeping Lovegrass), E trichophora (Hairy Lovegrass), Anthephorapubescens (Wool Grass), Aristida congesta (Tassel Three-awn), Digitaria eriantha (Common Finger Grass) and Cynodon dactylon (Couch Grass).

Alien vegetation species such as Opuntia sp. were noted on site

The summer rainfall is erratic with an average of 450mm per year. Temperatures vary between -11 degrees Celsius and 41 degrees Celsius, with an average of 18 degrees Celsius. The erratic summer rainfall makes this a high risk area for agronomy. Crops, such as maize, have replaced the grazing for which this area is better suited. The area has a very poor conservation status (Bredenkamp, et al., 1996). Today natural vegetation is only represented by small remnants which are often degraded as a result of overgrazing.

FAUNA

Mammalian species that have been noted in the area include Ichneumia albicanda (White-tailed mongoose), Pedetes capensis (springhare) and Lepus saxatilis (scrub hare).

Birds noted on site include Lanius collaris (fiscal shrike), Ardea melanocephala (Blackheaded heron), Pycnonotus nigricans (Redeyed bulbul), Streptopelia capicola (Cape Turtle Dove), Columba guinea (Rock Pigeon) and Passer melamurus (Cape Sparrow). Several small, seed-eating bird species, e.g. larks, finches and weavers were also seen but not positively identified.

Reptiles that may occur on site include the Yellow Cobra and Puff Adder.

SURFACE WATER AND GROUNDWATER RESOURCES

REGIONAL DESCRIPTION

Sand & Vet Catchments

The population in the Sand-Vet catchment area is concentrated in the main urban areas of Welkom and Virginia. The Welkom area is the gold mining capital of the Free State. Of the almost 600 000 people in the Sand-Vet area, more than two thirds live in urban areas.

About 52% of the 7 500 square kilometres of the Sand River catchment comprises grassland and bossieveld.

Dryland crops cover 42% and urban areas almost 2%.

Natural grassland and bossieveld cover 66% of the upper and 33% of the lower Vet River catchment. Dryland crops cover 31% of the upper and 63% of the lower catchment, while the total irrigated area is less than 1%. Dams, wetlands and pans cover 3% of the Vet River catchment and urban areas 1%.

The future demography of the Sand-Vet area will be largely influenced by economic opportunities and potential. Urban populations in this area may decline as a result of the anticipated decline in mining activity in the area and a lack of other economic stimulants.

Major dams in this area are the Allemanskraal Dam on the Sand River and Erfenis Dam on the Vet River. The Sand-Vet Government Water Scheme (GWS) and Sedibeng Water are currently meeting the requirements of consumers and other water users in the Free State Goldfields and the Lower Vet River Catchment.



The Sand-Vet GWS supplies water via a system of canals fed by Allemanskraal and Erfenis Dams. Sedibeng Water obtains most of its raw water from the Vaal River; the remainder is abstracted via a canal from the Sand River system.

The Welkom-Virginia area is the main urban centre supplied by Sedibeng Water. The Sand-Vet GWS is the most important irrigation area in the Middle Vaal Water Management Area.

Water in this region is used mainly for irrigation, mining and domestic purposes. A number of towns also abstract water from local groundwater resources. The surface water resources of the Vet River Catchment are already fully allocated to existing water users.

Water users in the Free State Goldfields rely heavily on water imported from the Vaal River by Sedibeng Water to meet their water demands.

STUDY AREA

No rivers or water or watercourses exist within 500m of the planned mining activities. A dry course crosses the fissure system 2km west of the existing Lovedale Mine excavation. This dry course is a storm water runoff channel and empties into the Sand River further downstream



"Doringspruit"

Wetlands

Within the study site itself no wetlands were identified. **Pans** Within the study site itself no pans were identified

GROUND WATER

The estimated depth of the water table:

Summer: 29m

Winter: 40m

Mean: 35m

Ground Water Use

Agriculture, livestock farming and mining

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

RIVER DIVERSIONS

No river diversions are required for this project.

AIR QUALITY

Air quality monitoring in the Free State is confined to a few local and district municipalities, and data is difficult to obtain. The Free State Draft Air Quality Management Plan assessed data Mangaung Local Municipality (MLM), Sasolburg and Vaal Triangle networks. The MLM stations are situated in Bloemfontein while the DEAT and Sasolburg networks represent an area within the Vaal priority area, Fezile Dabi District Municipality. The MLM has four ambient monitoring station within the Bloemfontein Central Business District (CBD) that monitors meteorological parameters, Sulphur Dioxide (SO₂), Particulate Matter <=10 μ m (PM₁₀) and Particulate Matter <=2.5 μ m (PM_{2.5}). The Sasolburg network comprises four continuous monitoring stations while the Vaal Triangle Priority Area (DEAT) network has only one station that falls within the Free State.

The sources of airborne particulate matter in the Free State 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 including quarries,
- □ 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.



SOCIO-ECONOMIC STRUCTURE OF THE REGION

Description: The Masilonyana Local Municipality is a Category B municipality located within the Lejweleputswa District in the Free State. It is situated between the province's biggest municipality, Mangaung Metro, in the south and the second-biggest municipality, Matjhabeng, in the north. It is one of five municipalities in the district. The following former Transitional Local Councils were amalgamated into the municipality: Theunissen, Brandfort, Winburg, Soutpan and Verkeerdevlei. It is an impoverished semi-urban area with a high unemployment rate.

The municipality plays host to two toll plazas on two major roads in the province; the Verkeerdevlei Plaza on the N1 is the last before entering Bloemfontein from the north, and the Brandfort Plaza on the former R30 (now ZR Mahabane Road) is situated between Brandfort and Bloemfontein. Brandfort is also known for its rich political history, which includes the National Military Museum on a farm that used to be a concentration camp during the Anglo-Boer War and the Winnie Mandela House, where Mandela was sentenced to House Arrest during the State of Emergency in the 1980s.

Theunissen is also situated on the ZR Mahabane Corridor between Bloemfontein and Welkom, and hosts the three mines within the municipal jurisdiction. Winburg has economic potential because of its location, which is 100km west of Bloemfontein, and its linking of Bloemfontein with Johannesburg, Cape Town and Durban. It prides itself with the Voortrekker Monument as its Heritage Site, and Masilonyana boasts several game reserves across all its towns.

The municipality prides itself on its tourist destinations, such as the Florisbad National Quaternary Research Station. This is where the first human skull was discovered. There are also cooperatives in Soutpan working on the salt lakes to produce salt.

Area: 6 618km²

Cities/Towns: Brandfort, Soutpan, Theunissen, Verkeerdevlei, Winburg

Main Economic Sectors: Agriculture, mining, community services

Demographic Information

	2016	2011
Population	62 770	59 895
Age Structure		
Population under 15	28.0%	29.7%
Population 15 to 64	66.7%	64.5%
Population over 65	5.4%	5.8%
Dependency Ratio		
Per 100 (15-64)	50.0	55.0
Sex Ratio		
Males per 100 females	103.7	102.0
Population Growth		
Per annum	1.07%	n/a
Labour Market		
Unemployment rate (official)	n/a	n/a
Youth unemployment rate (official) 15-34	n/a	n/a
Education (aged 20 +)		
No schooling	4.4%	7.7%
Matric	25.9%	21.1%
Higher education	6.0%	4.0%
Household Dynamics		
Households	21 558	16 476
Average household size	2.9	3.3
Female headed households	39.6%	43.1%
Formal dwellings	84.0%	82.6%
Housing owned	68.3%	64.8%
Household Services		

	2016	2011
Flush toilet connected to sewerage	84.4%	69.9%
Weekly refuse removal	65.0%	52.9%
Piped water inside dwelling	26.5%	29.3%
Electricity for lighting	92.5%	93.3%

Service Delivery Statistics

Is the service outsourced/commercialised?

	2015/162014/152013/142012/13201				32011/12
Water					
Blue Drop Score	n/a	n/a	29.64	n/a	11.40
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	18 829	18 829	17 728	17 548	17 303
Number of domestic households/delivery points	17 734	17 734	16713	16 533	16 288
Inside the yard	17 734	17 734	16713	16 533	16 288
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	3 600	4 252	4 562	3 800	4 925
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

Yes Yes Yes Yes Yes

Number of households and non-domestic customers to which provided	17 399	17 364	17 364	17 303	17 303
Domestic households with access to free basic service	3 600	4 252	4 562	3 800	4 925
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
Number of households and non-domestic customers to which provided	17 684	17 684	17 604	17 548	17 303
Number of households using:					
Flush toilet - public sewerage	15 160	15 160	15 160	15 160	14 915
Flush toilet - septic tank	572	572	572	516	516
Ventilated pit latrine	0	0	0	0	0
Bucket system	857	857	857	857	857
Other	0	0	0	0	0
Domestic households with access to free basic service	3 600	4 252	4 562	3 800	4 925
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	17 989	17 989	17 989	17 303	17 303

2015/162014/152013/142012/132011/12

HERITAGE AND CULTURAL ASPECTS

During the field survey and interrogation of literature no archaeological and cultural resources exist on the study area.

There is still a chance that some historical and/or cultural sites will be discovered during operation.

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 Afro-Wits Gold and Diamond Mining Company 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

VISUAL EXPOSURE

Due to the location of the Farm, the property is generally blocked from view over the medium to long distance (5km and beyond) in all directions

SENSITIVE LANDSCAPES

No sensitive landscapes are identified on the study area.

SPECIALIST STUDIES

Due to the limited level of detail that is normally implemented during a scoping exercise, it will be imperative to conduct detailed flora and fauna investigations in order to enable understanding of the potential impacts of the proposed project fully. The area has been well documented in reports of the fauna and flora. It is therefore not require for any specialist studies.

DESCRIPTION OF CURRENT LAND USES

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.

(v) IMPACTS AND RISKS

ACTIVITY

Roads-The proposed activity will use the current farm roads. Any alternative will require that additional fauna and flora be destroyed. The will result in greater negative impact on the geology, soil, noise, nuisance dust and possible disturbance to the drainage pattern.

Processing Plant-The rotary pan plant is the most environmental friendly method as the slime produced is a combination of water and sand only (puddle). The alternative in the form of a Dense Medium Separator are using ferrosilicon as medium, which would be detrimental in cases of spillage.

Temporary Topsoil and Waste dump area. The proposed location would be the historically area used for placement of the topsoil and waste dump area. Any alternative would therefore have greater impacts and risks on the fauna and flora, landscaping and visual impact, current land use, air pollution, ground and surface water pollution.

Infrastructure and facilities. The use of the historical prospecting and mining area would have the least impact as the area is already disturbed. Any alternative would increase the impact and risks on fauna and flora, landscaping and visual impact, current land use, ground and surface water pollution.

Discard dam/Slimes dam - The use of the historical prospecting and mining slimes area would have the least impact as the area is already disturbed. Alternative would increase the impact on the fauna and flora, landscaping and visual impact, current land use, ground and surface water pollution.

IMPACTS AND RISKS IDENTIFIED, NATURE, PROBABILITY, EXTENT, DURATION, INTENSITY AND SIGNIFICANCE

Prospecting Activity	Impact On	Probability	Extent	Duration	Intensity	Significance
Roads and Hauling	Air Quality	Likely	Site-Minimised through Dust control measures	Medium	Moderate	Moderate
	Fauna	Definite	Footprint Specific- Reversed with rehabilitation	Long	Low	Moderate
	Flora	Definite	Footprint-Reversed with rehabilitation	Long	Low	Moderate
	Soil	Definite	Footprint	Long	Moderate	Moderate
	Surface Water	None	Site	Medium	Low	Low
	Topography	None	Footprint	Short	Low	Insignificant
	Noise	Definite	Site-Managed through Maintenance program of TMM's	Short	Moderate	Low
	Visual	Possible	Regional-Reversed with rehabilitation	Long	Low	Insignificant
	Soil	Highly Likely	Site specific-Reversed with rehabilitation	Long	Low	High
Open Pit	Air Quality	Definite	Site Specific-Minimised through Dust control measures	Medium	Moderate	Moderate
	Fauna	Possible	Site Specific-Reversed with rehabilitation	Long	Moderate	High
	Flora	Possible	Site Specific-Reversed with rehabilitation	Long	Moderate	High
	Noise	Likely	Local-Managed through Maintenance program of TMM's	Long	High	Medium
	Soil	Definite	Reversed with rehabilitation	Long	Moderate	High
	Topography	Definite	Site -Irreplaceable loss	Long	Low	Low
	Visual	Definite	Local-Reversed with rehabilitation	Medium	Insignifican t	Insignificant
	Archaeological	None	Global-Awareness program	Permanent	Low	Very High
	Land Use	Possible	Site -within EA area	Medium	Low	Low
Plant and Processing areas	Air Quality	Definite	Site -Managed through Dust control measures	Moderate	High	Medium
	Fauna	Definite	Site -Reversed with	Long	Moderate	High

			rehabilitation			
	Flora	Definite	Site -Reversed with rehabilitation	Long	Moderate	High
	Noise	Definite	Site -Reversed with rehabilitation	Long	High	Medium
	Soil	Definite	Site -Irreplaceable loss Used for backfill purposes to some extent	Long	High	High
	Surface water	Likely	Site -Mitigated to some extent with water barricade	Long	High	Low
	Visual	Definite	Site -Mitigated to some when rehabilitated	Long	High	Insignificant
Waste Dump and Topsoil	Air Quality	None	Site -Managed through Dust control measures	Short	Low	Medium
	Fauna	Definite	Site -Reversed with rehabilitation	Long	Moderate	High
	Flora	Definite	Site -Reversed with rehabilitation	Long	Moderate	High
	Soil	None	Site -Reversed with rehabilitation	Long	Moderate	High
	Topography	Definite	Site -Irreplaceable loss Used for backfill purposes to some extent	Permanent	Insignifican t	Low
	Visual	Definite	Site -Mitigated to some when rehabilitated	Medium	Low	High
	Surface Water	Possible	Site -Mitigated to some extent with water barriers	Medium	Moderate	Low
Discard Dam	Air Quality	None	Site -Managed through Dust control measures	Short	Moderate	Low
	Fauna	Definite	Site -Reversed with rehabilitation	Long	Moderate	High
	Flora	Definite	Site -Reversed with rehabilitation	Long	Moderate	High
	Noise	None	Site -Reversed with rehabilitation	Short	Low	Medium
	Soil	Definite	Site -Irreplaceable loss Used for backfill purposes to some extent	Long	Moderate	High
	Topography	Definite	Regional-Mitigated to some when rehabilitated	Long	Low	Low
	Visual	Definite	Site -Mitigated to some when rehabilitated	Long	Low	Medium
	Surface Water	Definite	Site -Mitigated to some extent with water barricade	Medium	Moderate	Low
	Ground water	None	Regional -Mitigated to some extent with water barricade	Long	Very high	Very High Significance
Topsoil Storage	Air Quality	Possible	Site -Managed through Dust control measures	Long	Low	High
	Fauna	Definite	Site -Reversed with rehabilitation	Long	Moderate	High
	Flora	Definite	Site -Reversed with rehabilitation	Long	Moderate	High
	Noise	Possible	Site -Reversed with rehabilitation	Short	Low	Medium
	Soil	Definite	Site -Irreplaceable loss Used for backfill purposes to some extent	Medium	Moderate	High
	Topography	Definite	Site -Mitigated to some when rehabilitated	Long	Low	Low
	Visual	Definite	Site -Mitigated to some when rehabilitated	Long	Low	Insignificant
Office, Ablution facilities. &	Air Quality	None	Footprint-Managed through Dust control measures	Short	Insignifican t	Low
other temporary	Fauna	Definite	Footprint-Reversed with rehabilitation	Long	Low	Low
buildings	Flora	Definite	Footprint-Reversed with rehabilitation	Long	Low	Low
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	Noise	None	Footprint-Reversed with rehabilitation	Short	Low	Low
	Soil	Definite	Footprint-Irreplaceable loss Used for backfill purposes to some extent	Long	Low	Insignificant
	Visual	Definite	Site -Mitigated to some when rehabilitated	Long	Low	Insignificant
Workshops and Diesel	Air Quality	None	Site -Managed through Dust control measures	Very Short	Low	Insignificant
Tanks	Fauna	Definite	Site -Reversed with rehabilitation	Long	Low	Medium
	Flora	Definite	Site -Reversed with rehabilitation	Long	Low	Medium
	Noise	Possible	Site -Reversed with rehabilitation	Short	Low	Medium
	Soil	Definite	Site -Irreplaceable loss	Long	High	Medium
	Visual	Definite	Site -Mitigated when rehabilitated	Long	Moderate	Medium
	Groundwater	Likely	Site -Mitigated with drip trays/oils/solvents/domes tic and industrial waste	Long	High	High

(vi) Methodology

Methodology used in determining and ranking nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks. The impacts were individually described and assessed using the criteria drawn from the Environmental Impact Assessment (EIA) Regulations, published by the DEA in terms of the NEMA (Act 107 of 1998). The significance of each impact is assessed using the following formula (before and after mitigation): Significance Point (SP) = (Probability + Extent + Duration) x Intensity

The significance of the impacts was determined through the consideration of the following criteria:

Probability:	Provides a description of the likelihood/probability of the		
	impact occurring		
Extent:	Describes the spatial scale over which the impact will be		
	experienced		
Duration:	The period over which the impact will be experienced		
Intensity:	The degree/order of magnitude/severity to which the impact		
	affects the health and welfare of humans and the		
	environment		
Significance:	Overall significance of the impact on components of the		
	affected environment and whether it is a negative or positive		
	impact		

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

		Probability (P)			
None (N)	1	The possibility of the impact occurring is none, due either to			
		the circumstances, design or experience (0%).			
Possible (P)	2	The possibility of the impact occurring is very low, due			
()		either to the circumstances, design or experience (25%).			
Likely (L)	3	There is a possibility that the impact will occur to the extent			
		that provisions must therefore be made (50%).			
Highly likely	4	It is most likely that the impacts will occur at some stage of			
(H)		the development and plans must be drawn up before			
Definite (D)	г	carrying out the activity (75%).			
Definite (D)	Э	nlans and only mitigation actions or contingency plans to			
		contain the effect can be relied on (100%).			
	1				
	T	Extent (E)			
Footprint (F)	1	The impact area extends only as far as the activity which			
<u> </u>	2	occurs within the total site area.			
Site (S)	2	The impact could affect the whole site or a significant nortion of the site			
Regional (R)	3	The impact could affect the area including the neighbouring			
negional (n)	5	farms, the transport route and/or the adjoining towns.			
National (N)	4	The impact could have an effect that expands throughout			
		the country.			
International	5	Where the impact has international ramifications that			
(1)		extend beyond the boundaries of the country.			
		Duration (D)			
The period ove	er which	Duration (D)			
The period ove	er whic	Duration (D) the impact will be experienced 0-3 years (or confined to the construction period).			
The period ove Temporary (T)	er whic	Duration (D) th the impact will be experienced 0 – 3 years (or confined to the construction period).			
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The period over Temporary (T) Short term (S) Medium term (M) Long term (L) Permanent (P)	er which 1 2 3 4 5	Duration (D) ch the impact will be experienced 0 - 3 years (or confined to the construction period). 3 - 10 years (or confined to the construction and part of the operational period). 10 - 15 years (or confined to the construction and whole operational period). For the whole life of mine (including closure and rehabilitation period). Beyond the anticipated lifetime of the project.			
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(vii) POSITIVE AND NEGATIVE IMPACTS

ENVIRONMENTAL ATTRIBUTES	
Geographical	None as the geography will remain the same
Physical	Currently disturbed due to historical mining and prospecting activity. With the rehabilitation program the study area will be in a more improved environmental state. Mineral resource be exploited.
Biological Temporary Waste Dump and Topsoil Area Discard Dam Site Office, Ablution Facilities, Workshop and Infrastructure	Fauna and Flora destruction Possible Soil contamination Contamination to ground and surface water Negative impact on air quality Increase impact on noise pollution Disturbance to current land use
Social	Currently no communities live on the study area. With the prospecting activity a change in the social dynamics can be expected.
Economic	The landowners would be generating income from the project to initiate other development projects. Members from the community that currently live in the broader Theunissen town would be employed. Income to the State coffers due to tax and royalties. Promotion of women in mining Increase local economic development of BEE entrepreneurs and other business in Theunissen area.
Heritage and Culture	No Impact on heritage and cultural sources.

LOCATION- The diamond gravel resources is site specific and no alternative was considered.

(viii) MITIGATION MEASURES

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	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post- closure)	SIGNIFICA NCE 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	SIGNIFICA NCE if mitigated
control, berms, roads, pipelines, power lines, conveyors,	etcetc)				through rehabilitation	
ROADS	Air Quality	Nuisance dust would be created by the prospecting equipment and load and hauling of the material between the pit area and plant processing area.	Construction and Operational phase	Moderate	To wet roads or use a dust agent.	Low
	Flora	Haulage roads will destroy the vegetation	Construction and Operational phase	Moderate	Re-establish self-sustaining vegetation units in rehabilitated areas; and control invasion by exotic and invasive plant species	Insignificant
	Fauna	Haulage roads will destroy fauna habitat	Construction and Operational phase	Moderate	Re-establish vegetation in cleared areas and therefor a habitat to wildlife and eliminate poaching and the extermination of animal species within the boundaries of the prospecting area.	Insignificant
	Noise	Noise from the prospecting equipment on the haulage roads.	Construction and Operational phase	Low	Control the incidence of unacceptable noise levels.	Insignificant
	Surface Water	No impact to surface water is expected from the roads.	Construction and Operational phase	Insignificant	Water conservation. Eliminate the contamination of run-off surface water.	Insignificant
	Topography	No impact on topography is expected from the roads.	Construction and Operational phase	Insignificant	Remain within road demarcation	Insignificant
	Visual	The roads will be visible to some extent from the immediate surroundings	Construction and Operational phase	Low	Minimise aesthetic disturbance. Reduce the visual impact through continuous rehabilitation. Institute a Waste Management program that	Low

					will reduce the visibility effect.	
					Introduce a dedicated waste disposal area.	
	Soil	Soil contamination by TMM's	Construction and Operational phase	Moderate	Drip Trays and Spill kit	Low
OPEN PIT	Air Quality	Nuisance dust would be created by the prospecting equipment particularly Excavator and Dump Trucks	Operational	Moderate	Use of Dust agent	Low
	Fauna	Destruction during opening of pit	Construction	High	Re-establish vegetation in cleared areas and therefor a habitat to wildlife and eliminate poaching and the extermination of animal species within the boundaries of the prospecting area.	Insignificant
	Flora	Destruction during opening of pit	Construction	High	Re-establish self-sustaining vegetation units in rehabilitated areas; and control invasion by exotic and invasive plant species	Insignificant
	Noise	Increased Noise level due to TMM's	Construction and Operational	Medium	Control the incidence of unacceptable noise levels. Use of PPE	Insignificant
	Soil	Contamination during opening of pit	Operational	High	Drip Trays and Spill kit	Low
	Topography	Topography changed due to open pit excavation. Changing of natural slopes by open pit activities	Construction and Operational	Low	Ensure levelling and landscaping during rehabilitation	Positive
	Visual	Open excavation	Construction and Operational	Insignificant	Ensure levelling and landscaping during rehabilitation	Insignificant
	Archaeological	Loss of archaeological artefacts during bulk sampling	Construction and Operational	Very High	Awareness Program	Positive
	Land Use	Not available to land owner	Operational	Low	Currently not available due to historical mining and prospecting activity	Low
PROCESSING PLANT	Air quality	Nuisance dust would be created by the processing plant at ore transfer points from conveyors. Nuisance dust at tipping point into plant reception bin	Operational	Medium	Dust allay sprays	Low
	Fauna	Erection and operation of plant will disturb and destroy the natural habitat of the animals.	Construction and 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. Any type of snares and traps would be	Medium

					removed.	
	Flora	Erection and operation of plant will disturb and destroy the natural vegetation.	Construction	High	Indigenous vegetation to be used for landscaping to minimise water requirements. Any area that is rehabilitated or decommissioned will be seeded with a seed mixture reflecting the natural vegetation as is currently found. Management will control invader or exotic species on the site. General Treatment Procedure for invader or exotic species: Plants uprooted or cut off and can be destroyed completely. Only herbicides used that is registered for that purpose. Valid licences obtained from the Free State Nature Conservation before protected plants are removed. Fires will only be allowed in demarcated areas build for that purpose.	Medium
	Noise	Noise impact from the Processing plant especially scrubber will be created	Operational	Medium	 82dB(A)at the site boundary. Compliance to the Occupational Health and Safety Act, Act 85 of 1993. Comply with a program of good practice with regard to noise related impacts. If complaints are received from the public or state, noise levels will be monitored at prescribed monitoring points to ensure compliance within limits. Mechanical equipment /vehicles fitted with silencers and periodic maintenance program to ensure compliance with the Road Traffic Act. Hearing Protection available to all employees and visitors to the site. Screening/Migration control. Appropriate measures installed to reflect/reduce noise. 	Low
	Soil	The disturbance of the soil structure during Pit opening.	Operational	High	Prevent soil pollution. Limit soil compaction. Curb soil erosion. Reinstate growth medium able to sustain plant life. In all places will the first 300mm weathered	Low

					or loose material be classified as growth medium. In all areas where the above medium will be impacted on, it will be removed and stockpiled of 2.5m height. The growth medium would be used during rehabilitation phase on the impacted areas. If any soil is contamination during the prospecting operation, it will be removed with the industrial waste to a recognized facility or company. Topsoil will be kept separate from overburden and will not be used for road maintenance.	
	Surface water	Impact on surface water is expected during the bench cutting activities	Operational	Low	Water conservation and elimination of run-off water contamination of surface water.	Insignificant
	Visual	The plant will be visible to some extend from the immediate surroundings	Construction and Operational	Insignificant	Insignificant	Insignificant
TEMMPORARY WASTE DUMP AND TOPSOIL AREA	Air quality	Nuisance dust will be created by the TMM equipment when the material is dumped/ stockpiled in these areas	Construction and Operational	Medium	Air quality: To limit the creation of nuisance dust the following management guidelines will be followed: 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 and/ or destroyed in these areas	Commissioning Construction and Operational	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 mine. Any form of poaching by company employees 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	Medium
	Flora	Where topsoil and waste dumps are established it will destroy the flora	Commissioning Construction and Operational	High	Indigenous vegetation to be used for landscaping to minimize watering requirements. Any area that rehabilitated or	Low

becompletely be
Initiatures reliecting the hatural 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 prospecting area. The following control methods will be used: The plant will be uproted 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
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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.
Soil The disturbance of the soil Commissioning High Soils
structures and soil To prevent soil pollution
contamination during
erretion of the waste and
to rejust a growth medium able to
activities a growth median able to
activities Sustain plant line.
In an place of development the first southing
or 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
the mine. 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. 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.	
	Topography	Changing of natural slopes by waste and topsoil dumps	Commissioning Construction and Operational	Low	To reduce the potential of surface erosion caused by runoff. Water barriers protection against runoff	Low
	Surface water	Impact to surface water pathway.	Operational	Low	Relocate waste and topsoil area To conserve water; and To eliminate the contamination of run-off and sources of surface water.	Insignificant
	Visual	The dumps will be visible to some extend from immediate surroundings,	Operational	High	Only Landscaping on completion of project	Low
DISCARD DAM	Air Quality	No impact to air quality expected.	Commissioning Construction and Operational	Low	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 to take place as soon as possible	Low
	Fauna	The natural habitat of the animals will be disturbed when the plant residue is created.	Construction and Operational	High	If any endangered species are found on the prospecting 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 mine 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	Low

				species are encountered the Department of	
				Nature Conservation will be contacted.	
Flora	The natural vegetation will	Commissioning	High	Indigenous vegetation to be used for	Low
	be disturbed when the	Construction and		landscaping to minimize watering	
	prospecting residue is	Operational		requirements. Any area that rehabilitated or	
	created.			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 prospecting	
				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 berbicide that is	
				registered for use in connection therewith	
				and in accordance with the direction for the	
				use of such an herbigide: The and objective	
				of the re vegetation program will be to	
				of the re-vegetation program will be to	
				Achieve a stable self-sustaining habitat unit,	
				vegetation on hat surfaces will be	
				established using dry land technique	
				Frequiring no irrigation; valid permits from the	
				Free State 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 site.	
Noise	No noise impact is	Commissioning	No	No measures taken	No
	expected.		Significance		Significance
Soil	The disturbance of the soil	Commissioning	High	Soils	Medium
	structure when the			To prevent soil pollution	
	residue dam is created.			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 the prospecting phase, 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. 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.	
	Topography	Changing of natural slopes	Commissioning Construction 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
	Visual	The operational residue dam will be visible to the immediate surroundings	Commissioning Construction Operational	Medium	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.	Insignificant
	Surface water	No impact to surface water is expected	Commissioning Construction Operational	Low	Water conservation and elimination of run-off water contamination on surface water	Insignificant
	Groundwater	No impact to groundwater expected.	Commissioning Construction Operational	Very High Significance	Water conservation. Construction of dam	Medium
OFFICES, ABLUTION FACILITIES AND OTHER INFRASTRUCTURE	Air Quality	Nuisance dust will be created by the processing plant and bulk sampling activities.	Commissioning Construction Operational	Low	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	Low

				water; Re-vegetation of rehabilitated areas	
				not occupied by infrastructure to take place	
				as soon as possible	
Fauna	The natural habitat of the	Operational	Hiah	If any endangered species are found on the	Low
1 dunia	animals will be disturbed	oporational	riigii	operational area they will be relocated. If this	2011
	ar destroyed when the			is not possible potential changes in the	
	infrastructure is areated			is not possible potential changes in the	
	initastructure is erected.				
				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 mine 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	Operational	High	Indigenous vegetation to be used for	Low
1 Iora	he disturbed the	oporational	riigii	landscaping to minimize watering	2011
	infractructure is created			requirements. Any area that rehabilitated or	
	initastiuciure is erecteu.			decommissioned will be seeded with a good	
				decommissioned will be seeded with a seed	
				mixtures reflecting the natural vegetation as	
				is currently found. If this is not to be feasible	
				during renabilitation a general seed mixture	
				of the area will be used. Management will	
				also take responsibility to control declared	
				invader or exotic species on the prospecting	
				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	
				Fires will only be allowed in facilities of	
				equipment specially constructed for this	
				purpose. If required by applicable legislation,	
				a firebreak will be cleared around the	

					perimeter of the mine.	
	Noise	No Noise pollution	Operational	Low	Noise:	Low
		expected.			As a minimum, ambient noise levels	
					emanating from the mine will not exceed 82	
					dB(A) at the site boundary:	
					The applicant will comply with the	
					occupational noise regulations of the	
					Occupational Health and Safety Act. Act 85	
					of 1993.	
					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.	
					when the equivalent hoise exposure, as	
					Standarda Cada of Practica for the	
					Standards Code of Practice for the	
					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.	
					wechanical equipment: All mechanical	
					vehicles will adhere to the relevant poice	
					requirements of the Road Traffic Act	
					All vehicles in operation will be equipped	
					with a silencer on their exhaust system	
					Safety measures, which generate noise such	
					as reverse gear alarms on large vehicles.	
					will be appropriately calibrated/ 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.	
Soil	The disturbance of the soil	Operational	Insignificant	Soils	Insignificant
0011	with the erection of the site	oporational	molgrinoant	To prevent soil pollution	inoighineant
	office ablution facilities			To limit soil compaction	
	and infrastructure			To curb soil erosion: and	
				To reinstate a growth medium able to	
				sustain plant life	
				In all place of development the first 200mm	
				of loops or weathered meterial found will be	
				of loose of weathered material found will be	
				Lassined as a growin medium.	
				in all areas where the above growth medium	
				impacted on, it will be removed and	
				stockpiled on a dedicated area. The	
				maximum neight 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	
				the operation, 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.	
				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.	
 Visual	The erection of the site	Operational	Low	The main objective of the applicant is to	Low
	office, ablution facilities	eporational		rehabilitate the whole site in such a way to	
	and infrastructure			ensure that the topographical landscape	
				would blend in with the surrounding	
				landscape not nose a safety hazard to	
				humana and animala, while at the same time	
1		1		numans and animals, while at the same time	1

						allow for alternative land uses.	
WORKSHOP DIESEL TANKS	AND	Fauna	The erection of the Workshop and Diesel facilities and infrastructure will disturb the animal habitat	Construction Operational	Medium	If any endangered species are found on the operational 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 operation 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.	Low
		Flora	The erection of the Workshop and Diesel facilities and infrastructure will destroy the natural vegetation	Construction	Medium	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 prospecting 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 site.	Low
		Noise	The erection of the	Operational	Medium	Noise:	Low

Workshop and Diesel	As a minimum, ambient noise levels	
facilities and infrastructure	emanating from the site will not exceed 82	
will increase noise	dB(A) at the site boundary.	
pollution due to TMM's		
	The applicant will comply with the	
	occurational noise regulations of the	
	Occupational Health and Safety Act Act 85	
	of 1993.	
	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.	
	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.	
	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.	
	All vehicles in operation will be equipped	
	with a silencer on their exhaust system.	
	Safety measures, which generate noise such	
	as reverse gear alarms on large vehicles,	
	will be appropriately calibrated/ 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	
Soil	The erection of the Workshop and Diesel facilities and infrastructure may cause soil contamination. Improper use and discard of oils, grease, diesel and other lubricants	Construction Operational	Medium	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 the operation, 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.	Low
Visual	The erection of the Workshop and Diesel facilities and infrastructure will be visible from surroundings	Operational	Medium	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.	Insignificant
Groundwater	Improper use and discard of oils, grease, diesel and other lubricants	Construction Operational	Very High	Control and Management of oils, grease, diesel and other lubricants. Environmental awareness program. Discard procedure and approved service provider.	Medium

(ix) Site Selection Matrix

Weighing Factors	Impact	Preferred Site	Any Alternative
Proximity of neighbouring farms	Noise and Dust, Visibility.	✓	✓
Rehabilitation	The most effective and efficient rehabilitation program	~	
Definition of the infrastructure in relation to the prospecting resource	Destruction of Fauna and Flora when developing prospecting and access roads and plant with other complimentary infrastructure.	~	
Fauna and Flora	Destruction	\checkmark	
Water supply infrastructure	Any boreholes and canals	\checkmark	
Noise	Noise pollution	\checkmark	\checkmark
Dust (Wind Regime)	Air Quality	\checkmark	\checkmark
Visibility	Poor view from distance		
Landowner input	Land capability after mining	\checkmark	
Theunissen Community (Residential area)	Socio-economic and Cultural impact	~	~
Topography	Erosion factors	\checkmark	
Geology	Sterilization of mining resource	\checkmark	
Soil	Contamination and erosion	✓	✓
Surface Water	Contamination of canal	√	
Ground Water	Contamination	Not Known	Not Known
Sensitive Landscape	Destruction	✓	✓
Land Capability	Pre and Post land use	\checkmark	\checkmark

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

An alternative site was not identified as any alternative would have the following additional negative impacts:

- An additional 1.2 ha be cleared for mine roads with the destruction to fauna and flora
- Noise and dust impact to the adjacent farmer in terms of his residence
- Greater impact to the farm owner in terms of his current activity which is crop farming
- Extensive area to be cleared for a water pipeline
- Sterilization of a portion of the diamond resource
- Contamination to surface water due to the general topography and slope of the farm
- Viability of the project in terms of infrastructure, water sources, on-mine roads and distances, product transport cost, rehabilitation and closure program.

(x) No Alternative Option

No alternative location site has been considered as the diamond gravel resource is site specific. The site layout plan has been identified using an engineering selection process which is explained above.

The alternative for technology was changed from a Sortex to a grease Table recovery as it will achieve the same efficiency.

(xi) Concluding Statement

The applicant has applied for a Prospecting Right and is intending on prospecting the proposed areas in a sustainable, environmental sensitive manner. Due to the specific location of the kimberlitic source, alternatives could not be considered, as the impact on the environment and risks thereto would be more detrimental. The use of historical infrastructure as proposed in this Scoping Report, ensure that no additional impacts to the environment would be experienced.

(h) Plan Of Study

(i) Description of alternatives to be considered including the option of not going ahead with the activity.

There are no alternatives considered for the preferred site layout. The motivation for no-option has been described under (x) above.

(ii) Description of the aspects to be assessed as part of the environmental impact assessment process

This section describes the nature and extent of further investigations to be conducted in the Environmental Impact Assessment.

Geology, Topography and land-use: It is proposed that no specialist investigations are required. The assessment and detailed management measures will be provided in the EMPr report.

(iii) ASPECTS TO BE ASSESSED BY SPECIALISTS

No specialist studies will be commissioned.

(iv) METHOD OF ASSESSMENT

(v)

Methodology used in determining and ranking nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks. The impacts were individually described and assessed using the criteria drawn from the Environmental Impact Assessment (EIA) Regulations, published by the DEA in terms of the NEMA (Act 107 of 1998). The significance of each impact is assessed using the following formula (before and after mitigation): Significance Point (SP) = (Probability + Extent + Duration) x Intensity

The significance of the impacts was determined through the consideration of the following criteria					
	Probability:	Provides a description of the likelihood/probability of the			

,	
	impact occurring
Extent:	Describes the spatial scale over which the impact will be
	experienced
Duration:	The period over which the impact will be experienced
Intensity:	The degree/order of magnitude/severity to which the impact
	affects the health and welfare of humans and the
	environment
Significance:	Overall significance of the impact on components of the
	affected environment and whether it is a negative or positive
	impact

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

		design.
+	Positive impact	An impact that is likely to result in positive consequences/effects.

		Probability (P)
None (N)	1	The possibility of the impact occurring in none, due either to the circumstances, design or experience (0%).
Possible (P)	2	The possibility of the impact occurring is very low, due either to the circumstances, design or experience (25%).
Likely (L)	3	There is a possibility that the impact will occur to the extent that provisions must therefore be made (50%).
Highly likely (H)	4	It is most likely that the impacts will occur at some stage of the development and plans must be drawn up before carrying out the activity (75%).
Definite (D)	5	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on (100%).
E a atra riset (E)	1	Extent (E)
Footprint (F)	1	occurs within the total site area.
Site (S)	2	The impact could affect the whole site or a significant portion of the site.
Regional (R)	3	The impact could affect the area including the neighbouring farms, the transport route and/or the adjoining towns.
National (N)	4	The impact could have an effect that expands throughout the country.
International (I)	5	Where the impact has international ramifications that extend beyond the boundaries of the country.
	•	
		Duration (D)
The period ove	er whic	ch the impact will be experienced
Temporary (T)	1	0 – 3 years (or confined to the construction period).
Short term (S)	2	3 – 10 years (or confined to the construction and part of the operational period).
Medium term (M)	3	10 - 15 years (or confined to the construction and whole operational period).
Long term	4	For the whole life of mine (including closure and rehabilitation period).
Permanent (P)	5	Beyond the anticipated lifetime of the project.
()	1	Intensity (I)
Insignificant (I)	2	Will have a no or very little impact on the health and welfare of humans and environment
Low (L)	4	Will have a slight impact on the health and welfare of humans and environment
Moderate	6	Will have a moderate impact on the health and welfare of
(M)		humans and environment
High (H)	8	Will have a significant impact on the health and welfare of humans and the environment
Very high/ don't know (V)	10	Will have a severe impact on the health and welfare of humans and the environment

(vi) Stages of Consultation with Competent Authority

APPLICATION PROCESS	CONSULTATION
Public Consultations	Report on
	consultations
Water and Sanitation	Water use application:
	Department Water and
	Sanitation
Draft Scoping Report	DMR
Final Scoping Report	DMR
Draft EIR and EMP	DMR
Final EIR and EMP	DMR
Rehabilitation Guarentee	DMR
Granting and Execution	DMR

(vii) Public Participation Process

PUBLIC PARTICIPATION ACTIVITIES
Preparation of BID document
Identification of I&A (Scoping)
Public Notice Boards:
Farms
Library and Municipality OR ALTERNATIVE
Placement of Advert
Public Meeting
Input of Public Participation Process into Final Scoping
Report
Compile Draft EIR and EMP and forward to I&A
Compile Final EIR and EMP

(viii) Tasks of EIA process

The study area has previously been under prospecting and mining. Numerous literature and reports are available to the Applicant

TASK	DESCRIPTION	STATUS
Establish Baseline Environment	Evaluate and assess historical literature available.	Complete
	Conduct Field Assessment and verify Historical Reports. Input from Farm Owners.	
	Investigate any alternatives.	
	Identify Impacts and Risks and Assessment.	
	Identify the need for Specialist Reports	
Conduct Public Participation Process	Incorporate inputs into Draft EIA	
Compile Draft EIR Report	 Re-assess Legislative Context. Compile Reports: on Mitigation of Impacts and Risks identified Management objections, actions and Outcomes. Key findings of the EIA assessment. Assess any gaps in knowledge 	

	 Final proposed alternatives Rehabilitation and closure plan Measures to rehabilitate the environment. Mechanisms to monitor compliance Forward Draft EIR and EMP to I&A for input. 	
Final EIR and EMPR	Submit to DMR	

(ix) Measures to avoid, reverse, mitigate or manage impacts

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, etcetcetc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etcetc)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post- closure)	SIGNIFICA NCE 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	SIGNIFICA NCE if mitigated
ROADS	Air Quality	Nuisance dust would be created by the prospecting equipment and load and hauling of the material between the pit area and plant processing area.	Construction and Operational phase	Moderate	To wet roads or use a dust agent.	Low
	Flora	Haulage roads will destroy the vegetation	Construction and Operational phase	Moderate	Re-establish self-sustaining vegetation units in rehabilitated areas; and control invasion by exotic and invasive plant species	Insignificant
	Fauna	Haulage roads will destroy fauna habitat	Construction and Operational phase	Moderate	Re-establish vegetation in cleared areas and therefor a habitat to wildlife and eliminate poaching and the extermination of animal species within the boundaries of the prospecting area.	Insignificant
	Noise	Noise from the prospecting equipment on the haulage roads.	Construction and Operational phase	Low	Control the incidence of unacceptable noise levels.	Insignificant
	Surface Water	No impact to surface water is expected from the roads.	Construction and Operational phase	Insignificant	Water conservation. Eliminate the contamination of run-off surface water.	Insignificant
	Topography	No impact on topography is expected from the roads.	Construction and Operational phase	Insignificant	Remain within road demarcation	Insignificant
	Visual	The roads will be visible to some extent from the immediate surroundings	Construction and Operational phase	Low	Minimise aesthetic disturbance. Reduce the visual impact through continuous rehabilitation. Institute a Waste Management program that	Low

					will reduce the visibility effect.	
					Introduce a dedicated waste disposal area.	
	Soil	Soil contamination by TMM's	Construction and Operational phase	Moderate	Drip Trays and Spill kit	Low
OPEN PIT	Air Quality	Nuisance dust would be created by the prospecting equipment particularly Excavator and Dump Trucks	Operational	Moderate	Use of Dust agent	Low
	Fauna	Destruction during opening of pit	Construction	High	Re-establish vegetation in cleared areas and therefor a habitat to wildlife and eliminate poaching and the extermination of animal species within the boundaries of the prospecting area.	Insignificant
	Flora	Destruction during opening of pit	Construction	High	Re-establish self-sustaining vegetation units in rehabilitated areas; and control invasion by exotic and invasive plant species	Insignificant
	Noise	Increased Noise level due to TMM's	Construction and Operational	Medium	Control the incidence of unacceptable noise levels. Use of PPE	Insignificant
	Soil	Contamination during opening of pit	Operational	High	Drip Trays and Spill kit	Low
	Topography	Topography changed due to open pit excavation. Changing of natural slopes by open pit activities	Construction and Operational	Low	Ensure levelling and landscaping during rehabilitation	Positive
	Visual	Open excavation	Construction and Operational	Insignificant	Ensure levelling and landscaping during rehabilitation	Insignificant
	Archaeological	Loss of archaeological artefacts during bulk sampling	Construction and Operational	Very High	Awareness Program	Positive
	Land Use	Not available to land owner	Operational	Low	Currently not available due to historical mining and prospecting activity	Low
PROCESSING PLANT	Air quality	Nuisance dust would be created by the processing plant at ore transfer points from conveyors. Nuisance dust at tipping point into plant reception bin	Operational	Medium	Dust allay sprays	Low
	Fauna	Erection and operation of plant will disturb and destroy the natural habitat of the animals.	Construction and 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. Any type of snares and traps would be	Medium

					removed.	
	Flora	Erection and operation of plant will disturb and destroy the natural vegetation.	Construction	High	Indigenous vegetation to be used for landscaping to minimise water requirements. Any area that is rehabilitated or decommissioned will be seeded with a seed mixture reflecting the natural vegetation as is currently found. Management will control invader or exotic species on the site. General Treatment Procedure for invader or exotic species: Plants uprooted or cut off and can be destroyed completely. Only herbicides used that is registered for that purpose. Valid licences obtained from the Free State Nature Conservation before protected plants are removed. Fires will only be allowed in demarcated areas build for that purpose.	Medium
	Noise	Noise impact from the Processing plant especially scrubber will be created	Operational	Medium	 82dB(A)at the site boundary. Compliance to the Occupational Health and Safety Act, Act 85 of 1993. Comply with a program of good practice with regard to noise related impacts. If complaints are received from the public or state, noise levels will be monitored at prescribed monitoring points to ensure compliance within limits. Mechanical equipment /vehicles fitted with silencers and periodic maintenance program to ensure compliance with the Road Traffic Act. Hearing Protection available to all employees and visitors to the site. Screening/Migration control. Appropriate measures installed to reflect/reduce noise. 	Low
	Soil	The disturbance of the soil structure during Pit opening.	Operational	High	Prevent soil pollution. Limit soil compaction. Curb soil erosion. Reinstate growth medium able to sustain plant life. In all places will the first 300mm weathered	Low

					or loose material be classified as growth medium. In all areas where the above medium will be impacted on, it will be removed and stockpiled of 2.5m height. The growth medium would be used during rehabilitation phase on the impacted areas. If any soil is contamination during the prospecting operation, it will be removed with the industrial waste to a recognized facility or company. Topsoil will be kept separate from overburden and will not be used for road maintenance.	
	Surface water	Impact on surface water is expected during the bench cutting activities	Operational	Low	Water conservation and elimination of run-off water contamination of surface water.	Insignificant
	Visual	The plant will be visible to some extend from the immediate surroundings	Construction and Operational	Insignificant	Insignificant	Insignificant
TEMMPORARY WASTE DUMP AND TOPSOIL AREA	Air quality	Nuisance dust will be created by the TMM equipment when the material is dumped/ stockpiled in these areas	Construction and Operational	Medium	Air quality: To limit the creation of nuisance dust the following management guidelines will be followed: 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 and/ or destroyed in these areas	Commissioning Construction and Operational	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 site. Any form of poaching by company employees 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	Medium
	Flora	Where topsoil and waste dumps are established it will destroy the flora	Commissioning Construction and Operational	High	Indigenous vegetation to be used for landscaping to minimize watering requirements. Any area that rehabilitated or	Low

	aamplataly/			decommissioned will be seeded with a seed	
	completely			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 prospecting	
				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 barbicide that is	
				plants will be treated with all 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	
				aguinment appointly constructed for this	
				equipment specially constructed for this	
				purpose. If required by applicable registration,	
				a firebreak will be cleared around the	
A		A		perimeter of the prospecting area.	
Soll	The disturbance of the soil	Commissioning	High	Solls	
	structures and soil			To prevent soil pollution	
	contamination during			To limit soil compaction	
	erection of the waste and			To curb soil erosion; and	
	topsoil dump erection			To reinstate a growth medium able to	
	activities			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	
				stocknilled on a dedicated area. The	
				maximum hoight of stockhilos will be 2.5	
				maximum neight of stockpiles will be 2.5	
				The products and the second se	
				i ne growth medium/topsoli 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	
				the mine, 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. 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.	
	Topography	Changing of natural slopes by waste and topsoil dumps	Commissioning Construction and Operational	Low	To reduce the potential of surface erosion caused by runoff . Water barriers protection against runoff	Low
	Surface water	Impact to surface water pathway.	Operational	Low	Relocate waste and topsoil area To conserve water; and To eliminate the contamination of run-off and sources of surface water.	Insignificant
	Visual	The dumps will be visible to some extend from immediate surroundings,	Operational	High	Only Landscaping on completion of project	Low
DISCARD DAM	Air Quality	No impact to air quality expected.	Commissioning Construction and Operational	Low	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 to take place as soon as possible	Low
	Fauna	The natural habitat of the animals will be disturbed when the plant residue is created.	Construction and Operational	High	If any endangered species are found on the prospecting 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 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	Low

				encountered the Department of Nature	
				Conservation will be contacted.	
Flora	The natural vegetation will be disturbed when the prospecting residue is created.	Commissioning Construction and 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 site. 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 Free State Nature Conservation will be obtained before any protected plant species are removed; Fires will only be allowed in facilities or equipment specially constructed	Low
				for this purpose. If required by applicable legislation, a firebreak will be cleared around the perimeter of the prospecting site.	
Noise	No noise impact is expected.	Commissioning	No Significance	No measures taken	No Significance
Soil	The disturbance of the soil structure when the residue dam is created.	Commissioning	High	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.	Medium

					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 the mine, 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. 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.	
	Topography	Changing of natural slopes	Commissioning Construction 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
	Visual	The operational residue dam will be visible to the immediate surroundings	Commissioning Construction Operational	Medium	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.	Insignificant
	Surface water	No impact to surface water is expected	Commissioning Construction Operational	Low	Water conservation and elimination of run-off water contamination on surface water	Insignificant
	Groundwater	No impact to groundwater expected.	Commissioning Construction Operational	Very High Significance	Water conservation. Construction of dam	Medium
OFFICES, ABLUTION FACILITIES AND OTHER INFRASTRUCTURE	Air Quality	Nuisance dust will be created by the processing plant and bulk sampling activities.	Commissioning Construction Operational	Low	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	Low

					water; Re-vegetation of rehabilitated areas	
					not occupied by infrastructure to take place	
					as soon as possible	
F	Fauna	The natural habitat of the animals will be disturbed or destroyed when the infrastructure is erected.	Operational	High	as soon as possible If any endangered species are found on the operational 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 will result in the max form of	Low
					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 the infrastructure is erected.	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 prospecting 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	Low

					perimeter of the prospecting site.	
ľ	Noise	No Noise pollution	Operational	Low	Noise:	Low
		expected.			As a minimum, ambient noise levels	
					emanating from the operation will not exceed	
					82 dB(A) at the site boundary:	
					The applicant will comply with the	
					occupational noise regulations of the	
					Occupational Health and Safety Act, Act 85	
					of 1993.	
					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.	
					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	
					ieveis will be monitored at prescribed	
					Monitoring points.	
					Mechanical equipment. All mechanical	
					equipment will be in good working order and	
					requirements of the Dood Troffic Act	
					All vehicles in operation will be equipped	
					with a silencer on their overset system	
					Safety measures which concrete noise such	
					as reverse dear alarms on large vehicles	
					will be appropriately calibrated/adjusted	
					Screening/Migration control: Appropriate	
					measures will specifically be installed and or	
					amployed at the plant to act as scroon and	
					כוווטיבע מו נוופ טומווג נט מטג מס סטופפון מווע	

				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.	
Soil	The disturbance of the soil	Operational	Insignificant	Soils	Insignificant
	with the erection of the site	-1	3	To prevent soil pollution	- J
	office, ablution facilities			To limit soil compaction	
	and infrastructure.			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 baight of stocknillos will be 2.5	
				maximum neight of stockpiles will be 2.5	
				The growth modium/topooil will be used	
				during the rehebilitation of any impacted	
				during the renabilitation of any impacted	
				areas, after sloping in order to re-establish	
				the same land capability.	
				If any soli is contaminated during the life of	
				the operation, 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.	
				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.	
 Visual	The erection of the site	Operational	Low	The main objective of the applicant is to	Low
	office, ablution facilities			rehabilitate the whole site in such a way to	
	and infrastructure			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.	
WORKSHOP DIESEL TANKS	AND	Fauna	The erection of the Workshop and Diesel facilities and infrastructure will disturb the animal habitat	Construction Operational	Medium	If any endangered species are found on the operational 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 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.	Low
		Flora	The erection of the Workshop and Diesel facilities and infrastructure will destroy the natural vegetation	Construction	Medium	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 prospecting 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 Department 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 site.	Low
		Noise	The erection of the	Operational	Medium	Noise:	Low
Workshop and Diesel	As a minimum, ambient noise levels						
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facilities and infrastructure	emanating from the mine will not exceed 82						
will increase noise	dB(A) at the site boundary:						
pollution due to TMM's							
	The applicant will comply with the						
	occupational poise regulations of the						
	Occupational Hoat hand Sofaty Act. Act 85						
	of 1002						
	The applicant will comply with the measures						
	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.						
	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						
	Mechanical equipment: All mechanical						
	equinment will be in good working order and						
	vehicles will adhere to the relevant noise						
	requirements of the Road Traffic Act						
	All vehicles in operation will be equipped						
	with a silencer on their exhaust eveter						
	with a Shericer off there exhaust system.						
	Salety measures, which generate holse such						
	as reverse gear alarms on large vehicles,						
	will be appropriately calibrated/ 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	
Soil	The erection of the Workshop and Diesel facilities and infrastructure may cause soil contamination. Improper use and discard of oils, grease, diesel and other lubricants	Construction Operational	Medium	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 the operation, 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.	Low
Visual	The erection of the Workshop and Diesel facilities and infrastructure will be visible from surroundings	Operational	Medium	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.	Insignificant
Groundwater	Improper use and discard of oils, grease, diesel and other lubricants	Construction Operational	Very High	Control and Management of oils, grease, diesel and other lubricants. Environmental awareness program. Discard procedure and approved service provider.	Medium

AFFADAVIT

MALCOLM ANGUS GOLIATH

I, Malcolm Angus Goliath, Identity Number 6412145037082, the appointed Environmental Assessment Practitioner for:

NAME OF APPLICANT: ARO-WITS GOLD AND DIAMOND COMPANY (PTY) LTD

DMR FILE REFERENCE NUMBER SAMRAD: FS 30/5/1/1/2/10499 PR

hereby declare under oath;

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the Regulations when
 preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my
 possession that reasonably has or may have the potential of influencing any decision to be taken with
 respect to the application by the competent authority; and the objectivity of any report, plan or document to
 be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports
 that are submitted to the competent authority in respect of the application, provided that comments that are
 made by interested and affected parties in respect of a final report that will be submitted to the competent
 authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct;
- will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the Act.

 The correctness of the information provided in the Environmental Impact Report and Environmental Management Report

- · The inclusion of comments and inputs from stakeholders and I&APs ;
- · The inclusion of inputs and recommendations from the specialist reports where relevant; and

The acceptability of the project in relation to the finding of the assessment and level of mitigation proposed;

Signed this 1st day of March 2018 at Kimberley

Maleolm Angus Goliath

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(k) INFORMATION REQUIRED BY COMPETENT AUTHORITY

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, Welkom, Free State Province.

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

Annual performance Assessment and financial quantum reports will be conducted.

Employees must be instructed on how to tell the difference between hazardous waste and general waste.

Employees should be trained on how to separate hazardous waste and general waste and where to dispose of these.

Financial provision would be reviewed annually

(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).

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 Theunissen for the supply of prospecting consumables.

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

- 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
- Promotion of women in the mining fraternity

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*)(*v*) and (*v*ii) 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 and the prospecting conducted suggests that virgin ground would be prospected on. My conclusion is that the prospecting operation will have no impact on the heritage resource of the Free State Province

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 compiler of this document, also the appointed EAP, conducted a field visit and an in-depth desktop study conducted using existing literature and data. The photos taken in the scoping report bears testimony of the field visit.

I, Malcolm Angus Goliath, declare that -

General declaration:

- I act as the independent environmental practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the Regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct;
- will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest

• I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

God K

Signature of the environmental assessment practitioner:

BNL Nake Trading (PTY) LTD Name of company:

rune of company

17 March 2018 Date: