



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT And ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT:	DIAMOND DUMP RECOVERIES CC
TEL NO:	(053) 298 3355
CEL NO:	(082) 873 2565
FAX NO:	(086) 510 7120
POSTAL ADDRESS:	P O Box 550 Douglas 8730
PHYSICAL ADDRESS:	Bucklands Douglas 8730

FILE REFERENCE NUMBER SAMRAD: (NC) 30/5/1/2/2/11768 PR

1. IMPORTANT NOTICE

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

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

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

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

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

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

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

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

PART A
SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Contact Person and Correspondence Address

a) Details of

i) Details of the EAP

Name of the Practitioner:	ROELIEN OOSTHUIZEN
Tel No.:	084 208 9088
Fax No.:	086 510 7120
E-mail address:	roosthuizen950@gmail.com
Physical Address:	4 Millin Street, Hadisonpark, 8301
Postal Address:	P O Box 110823, Hadisonpark, 8306

ii) Expertise of the EAP

(1) The qualifications of the EAP

Masters in Environmental Management (UFS)
 B-Comm in Human and Industrial- Psychology (NWU)
 (with evidence attached as **Appendix 1**)

(2) Summary of the EAP's past experience

(In carrying out the Environmental Impact Assessment Procedure)

Relevant past experiences in carrying out the Environmental Impact Assessment Procedures include Environmental Impact Assessments, Environmental Management Plans/Programmes/ Reports, Performance assessments, Rehabilitation progress assessments, Environmental Liability assessments, Environmental compliance monitoring, Scoping Reports, etc.

See attached CV.

(with evidence attached as **Appendix 2**)

b) Description of the property

Farm Name:	Farm Number: 19
	Portions: Remainder
	Farm Name: Kransfontein
	Magisterial District: Hopetown
	Province: Northern Cape
	Title Deed No.: T28705/90
	Owner: Micoba Plase (Pty) Ltd
Application area (Ha):	253.0500 ha (two five three hundred comma zero five zero zero hectares)

Magisterial district:	Hopetown
Distance and direction from nearest town:	The farm is located approximately 50km away from Douglas, towards Prieska in the Northern Cape Province. Saxendrift the operations from Rockwell Diamonds is about 10km in a SSE direction from the target area. The Orange River is flowing approximately 2km to the NE of the area. Survey plan attached.
21 digit Surveyor General Code for each farm portion:	C033000000000190000

c) Locality map
(show nearest town, scale not smaller than 1:250000)

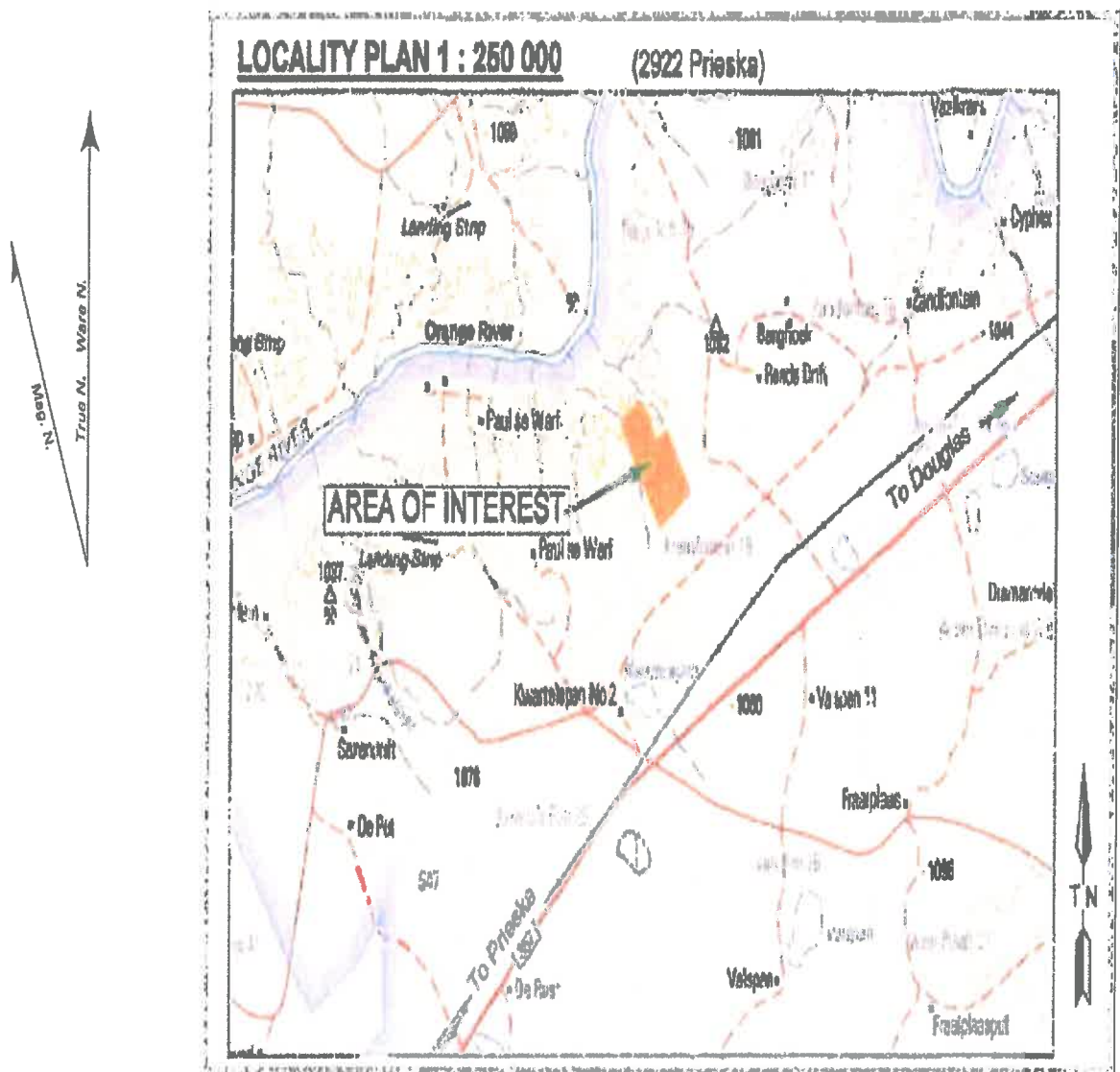


Figure 1: Locality Map 2922 Prieska the application area indicated with orange block

d) Description of the scope of the proposed overall activity

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

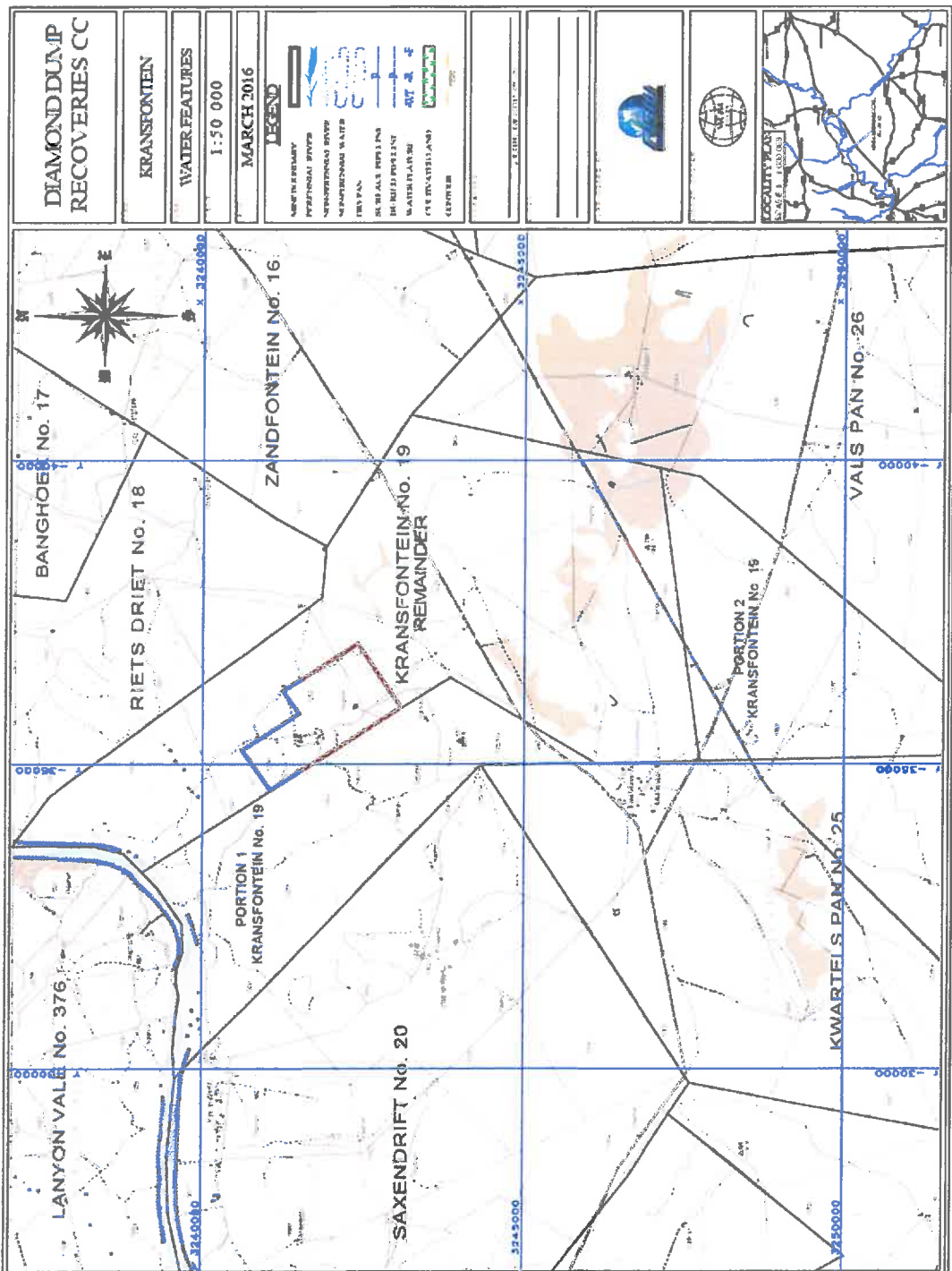


Figure 2: A plan indicating the overall location and extent of listed activities and main infrastructure on the DDR prospecting site

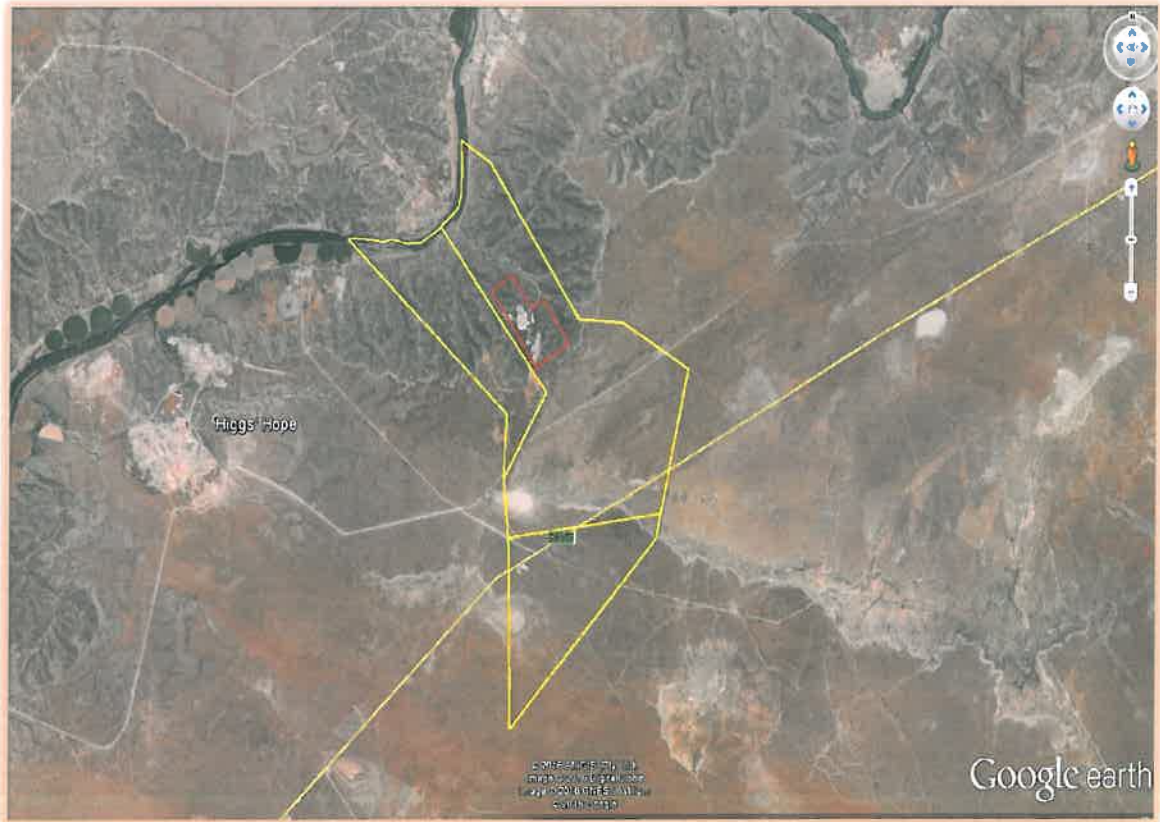


Figure 3 a & b: A google image of the area indicating the overall location and extent of listed activities and main infrastructure on the DDR prospecting site not to scale

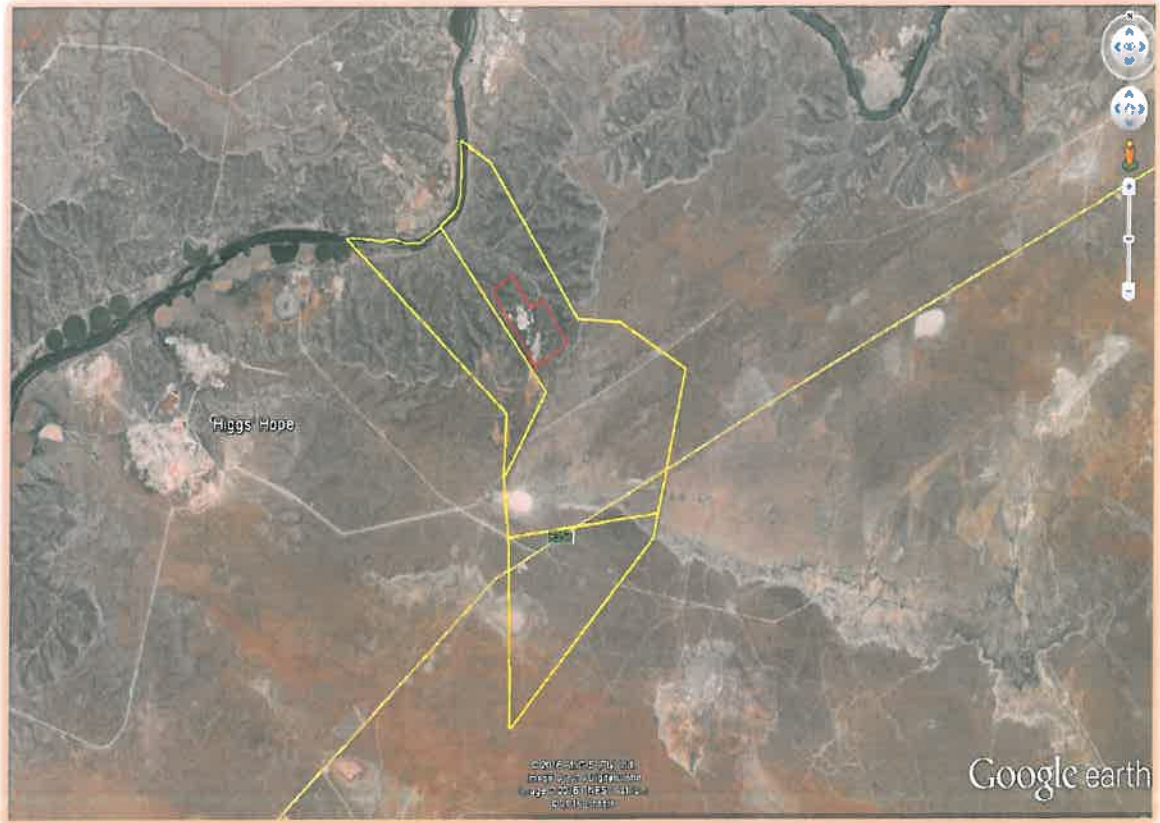


Figure 3 a & b: A google image of the area indicating the overall location and extent of listed activities and main infrastructure on the DDR prospecting site not to scale

i) **Listed and specified activities**

Table 1: Listed and Specified Activities

NAME OF ACTIVITY (All activities including activities not listed) (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc....etc....etc....)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY Mark with an X where applicable or affected	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
(Activity 20 of Listing Notice 1) Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	253.0500 ha application lodged for a surveyed portion of the farm	X	GNR 983
(Activity 19 of Listing Notice 2) The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), including associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).	253.0500 ha	X	GNR 984
(Activity 21 of Listing Notice 2) Any activity including the operation of that activity associated with the primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case activity 6 in this notice applies	0.3 ha for the plant	X	GNR 984
Activity 9 The construction of a pipeline exceeding 1 000 m in length for the bulk transportation of water from the Orange River.	The length of the pipeline is still not determined but could be more than 1000m.	X	GNR 983

(Activity 15)			
The DDR activities involve the clearance of more than 20 ha of indigenous vegetation.	Pits combined is 1.8750 ha but all activities could be more than 20 ha.	X	GNR 984
Diesel depot floor	90m ²	Not listed	
Oil diesel depot floor	60m ²	Not listed	
Wash bay floor	95m ²	Not listed	

ii) Description of the activities to be undertaken

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

Prospecting activities described in this application are designed to determine the diamondiferous gravel and overall mineral resource potential of the proposed application area. The prospecting activities will be a combination of both non-invasive and invasive methods. A suitable level of feasibility study (technical and economic evaluation) will also be undertaken. Initially, prospecting activities will be non-invasive and restricted to a desktop study which will include a literature survey, plus aerial photography and satellite image interpretation, ground validation of targets, and certain geophysical surveys. Subsequent phases will be of the invasive type, typical pitting and trenching.

Bulk sample test work will be undertaken to test the grade and ultimately the economic viability of the gravel found within the proposed prospecting area.

The application is for 253.05 ha of which approximately 35ha was worked. The Remainder is barren in terms of diamonds and comprise steep hills down into valleys. This previously worked area represents 14% of the area affected by prospecting operations. Diamond Dump Recoveries want to re-work, test part of the 35 ha only.

Prospecting activities will primarily make use of existing roads on the area. No new roads will be established. Sufficient existing roads exist.

Prospecting activities described in the Prospecting Work Programme (“PWP”) are designed to determine the gravel resource potential of the proposed application area. The prospecting activities will be a combination of both non-invasive and invasive methods. A suitable level of feasibility study (technical and economic evaluation) will also be undertaken.

Non-Invasive Prospecting Activities

Phase 1

i. Review of Past Exploration Results:

In order to direct the exploration programme in an efficient manner, there will be a review of all information and data gathered during previous exploration. A site investigation of the target areas will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed.

ii. Imagery Analysis and Geological Mapping:

High-resolution satellite images will be studied and used to geologically map the application area. Contacts between various lithologies will be mapped and specific attention will be given to delineate and define areas underlain by alluvial gravels.

Invasive Prospecting Activities

Phase 2

i. Invasive Prospecting Pits:



Figure 4: Locality of planned pits for bulk sampling indicated in red figures which is also the target areas and which is approximately 35 ha in extent.

Fifty pits will be excavated with the following dimensions: 25m long by 15m wide by varying depths for a total 78,375m³. It is estimated that on average 1.5 of overburden (calcrete and soil) will be removed before accessing the gravel layer (average width 1m) which is host to the diamonds.

The gravel will be tested to determine a grade (carats per hundred tonne) and value (US\$ per carat). The closest alluvial operation is about 5km downstream which necessitates bulk sampling for this project.

Phase 3

i. Bulk Sampling:

The planned bulk sampling technique is that of a typical South African alluvial diamond operation. The planned prospecting method is a strip mining process with oversize material from the gravel scalping and the tailings from the plant, being used as backfill material prior to final rehabilitation. Gravels are excavated, loaded and transported to the nearby treatment facility using articulated dump trucks.

The access to the various gravel trenches will be provided by a haul road to the screening and processing plants. The operation is to be conducted using conventional open pit mining equipment comprising two 40-t road tipper trucks supported by appropriate 25-t excavator and 2 x front-end loaders.

The vegetated soil overlying the planned trenches is stripped prior to excavation to the gravel and stockpiled on a dedicated dump to be used for rehabilitation purposes at a later stage.

The gravel is loaded with a 25-t excavator into road tipper trucks. Ore is hauled to the screening plant. As an integral part of the bulk sampling processes, backfilling will take place continuously.

Gravels are loaded onto a vibrating grizzly and the +35mm oversize material is discarded back into the open pit (about 25% reduction). The remaining -35mm fraction is loaded into a double 10-foot rotary pan with a treatment capacity of 30 tph. A magnetic separator is used to extract some of the heavy banded iron stones. Tracer tests are done regularly to ensure that the pan is operating at the correct density. Concentrate is tapped from the pan every hour and transported in locked containers to the final recovery unit.

The final recovery unit consist of holding bins, sizing screen, sizing bins and one state of the art Flowsort and Sortex X-ray recovery unit which recover

diamonds from +2mm to -32mm size fraction. Final sorting of the X-ray concentrate will be done manually.

At an expected grade of 0.5 carats per hundred tonnes, 167 carats could be recovered from the gravels. Diamonds will be sold at a reputable diamond tender house in Kimberley to determine an average US\$ carat value for the diamonds.

ii. Infrastructure:

No infrastructure except farm roads will be affected by prospecting activities. Should trenching be undertaken a back-actor and front-end loader will enter onto the property.

The following equipment will be temporarily installed as part of the prospecting activities during the trenching and bulk sampling construction phase whereby it will be removed during the decommissioning phase.

2 x Front-end Loaders (Qualiprod)
1 x Excavator
2 x 20m ³ Tipper Truck
1 x MB 2535 Power Line Truck Crane
Interlink Trailers
Transport Bakkie
Sortex X-ray electronics sorters, c/w storage/transfer bins, sizing screen, conveyers, classifier and magnetic separator
Water pump with pipeline
3 x 6 meters containers (offices, tea room, ablutions)
2 x 10 feet washing pan with conveyers

All temporary infrastructure, equipment and other items used during the proposed prospecting period will be removed from the site. No Eskom power is available on the farm. All prospecting will be done with gensets.

iii. Rehabilitation:

The prospecting method involves a continuous backfilling open cast mining process. Topsoil will be stripped and hauled to already backfilled areas. If there are no backfilled areas available immediately, topsoil will be temporarily stockpiled on the surface for later use. No materials will be permanently dumped on the surface. Washed and screened material will be backfilled into the already mined out areas and will be covered with the overburden and topsoil that has been allocated for this purpose.

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

- All tailings or other material on the surface will be removed to the original topsoil level where possible. This material will then be backfilled into the open pits.
- Any compacted area will then be ripped to a depth of 300mm, where possible, the topsoil or growth medium returned and landscaped.
- All infrastructures, equipment, plant, and other items used during the operational period will be removed from the site.



Plate 1: Photo of the site when entering the gate to the site facing north, note the entire area has been disturbed previously

Water

Surface Water

The Orange River is the only surface water source which is located about 4km away from the application area. 100 000 liters per day of Water will be abstracted from the Orange River for the purpose of the proposed prospecting operation. No waste material resulting from the proposed prospecting operation will be dumped or pumped into any source of surface water. No source of surface water will therefore in any way be affected by the proposed prospecting operation.

Ground Water

There is one borehole at the gate where you enter the application area equipped with a sun pump for the pumping of water for animal drinking purposes. There are no boreholes that are known within the application area.

Waste Management

Proper sanitation facilities will be provided for employees. No person will pollute the workings with faeces or urine, misuse the facilities provided or inappropriately foul the surrounding environment with faeces or urine. Acceptable hygienic and aesthetic practices will be adhered to. Non-biodegradable refuse such as glass bottles, plastic bags, etc. will be sorted and stored in separate disposal lockable containers at a central point. It will be disposed of at a recognised disposal facility twice a month. Biodegradable refuse will either be handled as indicated, or be buried in a pit excavated for that purpose and covered with layers of soil when almost full. A final 0,5m thick layer of topsoil will be incorporated where practicable. Provision will be made for the future subsidence of the covering. Refuse will not be dumped in the vicinity of the prospecting area. Waste material with regard to vehicle repairs will be kept in 200 litres steel containers in the maintenance/farmstead area. This material will be disposed of at a recognised disposal facility once a month.

Access Roads

The property is accessed via the R357 tar road and a gravel road, as well as farm tracks on the property. Activities associated with the DDR prospecting that is expected to make use of these roads include:-

- The transportation of mining personnel to and from the site;
- Delivery of supplies and materials;
- The transportation of the product for the market.

These transport operations will make use of passenger vehicles, light delivery vehicles and very limited heavy vehicles.

Haul Roads

There will be one haul road to the plant area and one haul road to the bulk sampling site. NO new roads will be established. Sufficient existing roads exist. No other hauls will be constructed. Main haul roads will have a minimum width of 6m. No roads will be wider than 6m.

e) **Policy and Legislative Context**

Table 2: Applicable legislation and guidelines used to compile the report

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
<p>According to the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) prospecting operations can only commence once the applicant has received authorisation from the Department of Minerals Resources (DMR) in terms of their Prospecting Right application.</p>	<p>The title page makes reference to the accepted Prospecting Right</p>
<p>According to the MPRDA (Act 49 of 2008) Environmental Authorisation is required before prospecting activities can commence.</p>	<p>The environmental authorisation process is pending and this document is being compiled in order to fulfil the requirements thereof.</p>
<p>Section 38(1) (a) of the MPRDA requires that effect be given to the general objectives of integrated environmental management laid down in the NEMA. Integrated environmental management (IEM) is a philosophy, which prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development process in order to achieve a desirable balance between conservation and development.</p>	<p>This is contained in Part B: Environmental Management Programme Report</p>
<p>The required determination of a quantum of the financial provision as referred to in regulation 54 of the MPRDA, does not detract from the need for the EMP to identify all the environmental costs necessary to evaluate the achievement of the sustainable development objectives of the MPRDA. The EMP is, therefore, not merely a rehabilitation plan that identifies a quantum for financial provision, but rather a comprehensive programme that identifies all the costs necessary to inform the evaluation of the planning and implementation of a prospecting project.</p>	<p>This is contained in Part B: Environmental Management Programme Report</p>
<p>Section 4(a) of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) state that sustainable development requires the consideration of all relevant factors including the following:</p> <p>(i) Disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be altogether avoided, are minimised and remedied;</p> <p>(ii) Pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;</p> <p>(iii) Disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided or where it cannot be altogether avoided, is minimised and remedied;</p> <p>(iv) Waste is avoided or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner;</p> <p>(v) Use and exploitation of non-renewable natural resources is responsible, equitable and considers the consequences of the depletion of the resource; and</p> <p>(vi) Development, use and exploitation of renewable resources and</p>	<p>This is contained in Part B: Environmental Management Programme Report</p>

the ecosystems, of which they are part, do not exceed the level or 'critical limits' beyond which their integrity is jeopardised.	
Chapter 5 of NEMA (as amended), contain the EIA Regulations, as well as a schedule of activities that may have substantial detrimental effects on the environment and therefore require authorisation from the competent environmental authority.	This document as a whole serves that purpose.
The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa's natural biodiversity and its landscapes and seascapes. Chapter 2 lists all protected areas.	This document as a whole serves that purpose.
Section 52 of The National Environmental Management Act: Biodiversity Act (NEMBA) (Act 10 of 2004) states that the MEC/Minister is to list ecosystems that are threatened and in need of protection. Section 53 states that the Minister may identify any process or activity in such a listed ecosystem as a threatening process. A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations.	Control measures are contained in Part B: Environmental Management Programme Report
According to Section 22(1) of Chapter 5 of NEMBA the following activities are also prescribed as restricted activities - (a) Allowing any specimen of an alien or listed invasive species to grow, breed or multiply; (b) Allowing the movement or spread of a specimen of an alien or listed invasive species; (c) Releasing a specimen of an alien or listed invasive species.	Control measures are contained in Part B: Environmental Management Programme Report
In terms of the terms of Section 1 of the National Water Act, (Act No. 36 of 1998), a "water resource" includes a watercourse, surface water, estuary, or aquifer. In terms of Section 21 a licence is required for: (a) taking water from a water resource; (b) storing water; (c) impeding or diverting the flow of water in a watercourse; (d) engaging in a stream flow reduction activity (such as in section 36); (e) engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1); (f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit; (g) disposing of waste in a manner which may detrimentally impact on a water resource; (h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process; (i) altering the bed, banks, course or characteristics of a watercourse; (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and; (k) using water for recreational purposes.	Control measures will be contained in Part B: Environmental Management Programme Report. A WULA application will follow and the Department of DWS has been consulted. Section 21 water uses that will be applied for include Section 21(a) abstraction and 21(b) for the Mine Residue Stockpile if the bulk sampling stage is reached.

<p>The World Heritage Convention Act (Act 49 of 1999) Recognises that the cultural heritage and the natural heritage are among the priceless and irreplaceable possessions, not only of the Republic, but of humankind as a whole. It also acknowledges that the loss, through deterioration, disappearance or damage through inappropriate development of any of these most prized possessions, constitutes an impoverishment of the heritage of all the peoples of the world and, in particular, the people of South Africa.</p>	<p>Control measures will be contained in Part B: Environmental Management Programme Report.</p> <p>A Phase 1 Heritage Assessment has already been done for this area.</p>
<p>The National Heritage Resources Act (Act No. 25 of 1999) legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha or linear development exceeding 300 m in length. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).</p>	<p>Control measures will be contained in Part B: Environmental Management Programme Report</p>
<p>Section 7 of the National Forests Act (No. 84 of 1998) state that no person may cut, disturb, damage or destroy any indigenous, living tree in a natural forest, except in terms of a licence issued under Section 7(4) or Section 23; or an exemption from the provisions of this subsection published by the Minister in the Gazette.</p> <p>Section 15 prevents any person to cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.</p>	<p>Control measures will be contained in Part B: Environmental Management Programme Report.</p>
<p>The Northern Cape Nature Conservation Act (Act No. 9 of 2009) aims to provide for the sustainable utilisation of wild animals, aquatic biota and plants.</p> <p>Section 3(a) and 4(a) states that no person may, without a permit by any means hunt, kill, poison, capture, disturb, or injure any protected or specially protected animals.</p> <p>Section 12 (1) states that no person may, on a land of which he or she is not the owner, hunt a wild animal without the written permission from the landowner.</p> <p>Section 49 (1) and 50 (1) states that no person may, without a permit pick, transport, possess, or trade in a specimen of a specially protected (Schedule 1) or protected (Schedule 2) plants.</p> <p>Section 51(2) states that no person may, without a permit, pick an indigenous plant (Schedule 3) in such manner that it constitutes large-scale harvesting.</p>	<p>Control measures will be contained in Part B: Environmental Management Programme Report.</p>
<p>This Conservation of Agricultural Resources Act (Act No. 43 of 1983) makes provision for the conservation of agricultural land.</p> <p>Section 5 prohibits the spreading of weeds, while Section 6 and Regulation 15 and 15 E of GNR 1048 addresses the implementation of control measures for alien and invasive plant species.</p> <p>Bush encroacher species are controlled in terms of Regulation 16; where land users of an area in which natural vegetation occurs and that contains communities of encroacher indicator plants are required to follow sound practices to prevent the deterioration of natural resources and to combat bush encroachment where it occurs.</p>	<p>Control measures will be contained in Part B: Environmental Management Programme Report</p>

Section 17 of the Fencing Act (Act No. 31 of 1963) 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 thereof 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.	Control measures will be contained in Part B: Environmental Management Programme Report
The National Environmental Management Act: Waste Act, 2008 (Act 59 of 2008) reforms the law regulating waste management in order to protect human health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.	This is contained in Part B: Environmental Management Programme Report
Section 25 of the Environmental Conservation Act (Act 73 of 1989) as well as the National Noise Control Regulation GNR 154 dated 10 January 1992, regulate activities regarding noise, vibration and shock.	Control measures will be contained in Part B: Environmental Management Programme Report
Section 8 of the Atmospheric Pollution Prevention Act (Act No. 45 of 1965) regulates controlled areas, and Section 27 regulates activities with regard to dust control.	Control measures will be contained in Part B: Environmental Management Programme Report
The Occupational Health and Safety Act, Act No. 85 of 1993 GNR 2281 of 1987 – 10-16 regulates environmental regulations for the workplace.	Control measures will be contained in Part B: Environmental Management Programme Report
The South African Civil Aviation Regulation Act (Act 13 of 2009) controls markings of structures that may influence aviation through the Civil Aviation Technical Standard, SA-CATS-AH 139.01.33 Obstacle Limitations and Markings outside Aerodrome or Helicopters.	The project information is contained in Part A, section d(ii).

f) Need and desirability of the proposed activities

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

Taking into consideration all the information captured in this report, the most appropriate procedure for planning and developing the proposed prospecting operation will involve the following:-

(i) Prospecting Method

The location of the mine is determined by the geological location of the mineral resource. This site has proven to have alluvial diamonds as it was mined before and left. Prospecting for alluvial diamonds by means of the method described, with the understanding that the formulation of an effective Environmental Management Programme and the implementation thereof, as well as the obtainment of an authorisation for the abstraction of water from a resource for mining purposes from the Department of Water and Sanitation in terms of the National Water Act, 1998 (Act No. 36 of 1998), is an inseparable part of the proposed operation.

(ii) Labour Force

Employing people who originate from within the boundaries of Siyancuma Municipality. This will guarantee benefits such as positive contribution to the local

economy; a decrease in local unemployment figures; a decrease in the social phenomena normally associated with unemployment, such as crime and alcohol abuse; and a positive contribution to cultural cohabitation.

(iii) Rehabilitation

Making financial provision for the implementation of a rehabilitation strategy as is required by Section 41 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

(iv) Environmental Monitoring

Carry out environmental monitoring on a regular basis, as is required by Regulation 55 of the Regulations published in Government Gazette No. 26275 under the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

(v) General

Being open to possible comments, suggestions and complaints received from neighbouring farmers, farm workers or members of the general public that might result from the implementation of the proposed prospecting operation.

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

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

The location of the mine is determined by the geological location of the mineral resource. The application area has been disturbed by previous mining and is not a pristine site. The site has been mined and left in 2008, only the basal gravels on this site have been processed and the two upper layers of gravels has been pushed aside. These two layers will be prospected to determine if it will be viable to do an application on this area for a Mining Right.

The application is for 253.05 ha of which approximately 35ha was worked. The Remainder is barren in terms of diamonds and comprise steep hills down into valleys. This previously worked area represents 14% of the area affected by prospecting operations. Diamond Dump Recoveries want to re-work, test part of the 35 ha only.

The un-rehabilitated site will have the chance to be rehabilitated and to return back to the original land use.

i) Details of the development footprint alternatives considered

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

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

In order to ensure that the proposed development enables sustainable development, a number of feasible options must be explored. Motivation for the footprint of the actual prospecting operation (i.e. excavations) will not be provided here, as the location of the mine is determined by the geological location of the mineral resource (as discussed in section f).

Prospecting Site Location

Prospecting infrastructure was strategic placed by incorporating prospecting project demands, environmental sensitivities and IAP concerns, as identified during the EIA process. Thus, the prospecting site location is primarily based on proximity to the access roads, proximity to the areas earmarked for prospecting and limited additional impact on the environment and heritage resource. This renders the consideration of further alternative locations in terms of the mine site location, other than the mine residue deposits, unnecessary.

Fuel Storage Tanks

Alternatives for fuel storage include surface storage, underground storage and the storage of fuel in mobile tanks with a metal bund wall. Underground storage has an adverse negative pollution potential, because it is not easy to monitor leakages. Remediation measures are also not as effective as compared to surface storage tanks. Mobile tanks are a viable option for infield screening activities, but the best viable long term option is the instalment of fuel tanks within a concrete bund wall. The final location of the fuel storage tanks were determined based on proximity to prospecting operations.

Water

Process water will be sourced from the Orange River. Other sources include pumping water from the slimes disposal facility and rain water that collects within the prospecting operations. Downstream from the mine, the water in the Orange River is used by farmers for stock watering and for central pivot and other irrigation. There are also other mines that draw water from the river.

Mine Residue Dam

The current locality of the mine residue dam was selected based on the following considerations:

- The locality is already mined out.

- It is within reach (1000m) of the treatment plant.
- It is situated near the access road to the mine.
- No underlying ore bodies or geological discontinuities.
- No geomorphological impacts.
- No structures, dwellings or other points of risk on down-stream side.
- Convenient material nearby for construction dam.
- Top soil from the treatment process will be available for final rehabilitation.

The slimes dam will be kept smaller than 50 000m³ to be classified as a small dam with a low risk for failure and which can be easily rehabilitated.

A standard slimes dam design will be established in order to maximise the holding capacity of the slimes dam and to minimise risks in terms of general safety and the DWS regulations.

Project Infrastructure

Alternatives and considerations pertaining to the project infrastructure were discussed in section d(ii).

Prospecting Method

The prospecting method of open trenches with continued backfilling is the only economic viable method currently being used by the alluvial diamond fraternity. No alternative mining method can be considered at this stage.

Proceed without the Mine (no-go)

Land Use

The current land use is grazing, with a low stock rate for the region. If the prospecting operation does not continue, the farming of sheep and game will persist. The most significantly activity associated with grazing is the provision of water. This could have a potential impact on the existing surface water features and ground water resource. Therefore alternative water sources are needed. No groundwater will be used for the prospecting operation.

Socio-Economy

The Diamond Dump Recovery project plan is to employ ±4 – 15 people. The non-approval of this prospecting operation would impact negatively on the employment rate for the region and the families who are likely to benefit from the positive employment opportunities. Simultaneously, it may have a negative effect on the economy of South Africa and the diamond industry as a whole. Substantial tax benefits to the State and Local Government will also be lost.

Biodiversity

Due to an already disturbed ecosystem, bare ground and spreading of exotics can follow. Surface areas possible disturbed is only restricted to the existing prospecting area. The majority of the surface area is already disturbed by old mining activities.

Currently vegetation cover is sparse with bare open areas open on the tailings on most of the area. Grass cover area scattered with mostly pioneer species evident. Trees area scattered all over the disturbed area of which most of them will be classified as alien species according to CARA regulations. Two endangered trees *Boscia albitrunca* were identified or noticed in an old disturbed site by the old diggers. The applicant has been made aware that they are protected and should not be disturbed without a permit.

Heritage and Cultural Resources

A heritage study was done in 2005 when the first mining activities took place on the same property and area. The artefacts seen during the survey were all from dug-over un-stratified contexts and have therefore no heritage value (**please see report from Peter B Beaumont attached**).

Should any other heritage features and/or objects be located or observed, a heritage specialist will be contacted immediately. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that a heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This is true for graves and cemeteries as well. If the prospecting operation is approved, the heritage resources if any other had been encountered will be protected through the demarcation of no-go zones and fencing off.

ii) Details of the Public Participation Process Followed

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

A copy of the relevant background document with the Prospecting Work Programme (“PWP”) information was sent by registered post to identified persons with a cover letter. Mrs Ferreira (Micoba Plase) the surface owner also received a registered letter and personal communication was done, confirmation letter and her approval letter has been attached as an **appendix**.

Letters was also send to various neighbouring people with adjacent farms or further away. All Government Departments identified were also notified by registered letters.

An advert was also placed in the DFA on the 04th February 2016 to invite any other interested parties to come forward and to register.

Notices were also put up at the SPAR in Douglas on the 03rd February 2016 and at the gate of the farm.

Another notice was published in the DFA on the 16th February 2016 to inform everybody of a public meeting that will be conducted on the 01st March 2016 at the Skuur in Douglas.

Consulted

Affected Parties	Method of Consultation
CP Bekker (neighbour and sister of surface owner)	Registered Mail
F Andrews (neighbour and sister of surface owner)	Registered Mail
JP Ferreira (owner of farm through [Micoba Plase])	Registered Mail and personal visit and a letter of consent was given to the applicant
Rockwell Diamonds – Saxendrift Mine (neighbouring mine)	Registered Mail
Jasper Mine (Pty) Ltd (neighbouring mine)	Registered Mail
Mrs Lizelle Beukes (from DWA – CMA)	Registered Mail
Mr Mattie Lotter (neighbour at the other side)	Registered Mail
ESKOM 053 – 830 5911 P.O. Box 606, Kimberley 8300	Registered Mail
SANRAL 021 – 946 1630 Private Bag X19, Bellville 7535	Registered Mail
TELKOM SA SOC The Regional Head: Northern Cape Private Bag X20700, Bloemfontein 9300	Registered Mail
Department of Rural Development and Land Reform 053 – 831 4090 Private Bag X2458, Kimberley 8300	Registered Mail
Department of Environment and Nature Conservation 053 – 807 7300 Private Bag X6102, Kimberley 8300	Registered Mail
Department of Agriculture and Land Reform 053 – 838 9100 Private Bag X5018, Kimberley 8300	Registered Mail
Department of Water and Sanitation 053 – 830 8800 Private Bag X6101, Kimberley 8300	Registered Mail
Department of Public Works 053 – 838 5200 Private Bag X5002, Kimberley 8300	Registered Mail

Table 3: Description of process to be undertaken to consult interested and affected parties

IDENTIFICATION CRITERIA	Mark with an X where applicable	
	YES	NO
Will the landowner be specifically consulted?	X	
Will the lawful occupier on the property other than the Landowner be consulted?	X	
Will a tribal authority or host community that may be affected be consulted?		X
Will recipients of land claims in respect of the area be consulted?		X
Will the landowners or lawful occupiers of neighbouring properties be identified?	X	
Will the local municipality be consulted?	X	
Will the Authority responsible for power lines within 100 metres of the area be consulted?	X	
Will Authorities responsible for public roads or railway lines within 100 metres of the area applied for be consulted?	X	
Will Authorities responsible for any other infrastructure within 100 metres of the area applied for be consulted? (specify)		X
Will the Provincial Department responsible for the environment be consulted?	X	
Will all other parties identified above be provided with a description of the proposed mining/prospecting operation as referred above?	X	
Will all the parties identified above be requested in writing to provide information as to how their interests (whether it be socio-economic, cultural, heritage or environmental) will be affected by the proposed prospecting project?	X	
Other, specify		

Table 4: Steps taken to notify interested and affected parties

Steps taken to notify any interested and affected parties (Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation: NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. Photographs of notice and copies of advertisements and notices notifying potentially interested and affected parties of the proposed application area attached)	PROVIDE DESCRIPTION HERE
Information that was provided to Interested and Affected Parties	<p>The landowner and the neighbours will be informed personally and consulted by the applicant and this will be confirmed in writing. A notice will be put up at the gate of the farm and entrance to the proposed Prospecting Area. A consultation letter will be send to the local municipality. An advert will be published in the local newspaper for comments and a public meeting will be held.</p> <p>A registered letter was sent to all identified parties on the 15th February 2016 with a comment registration form and a background document. All the listed compulsory information was covered in the background document.</p> <ul style="list-style-type: none"> ✓ The site plan. ✓ List of activities to be authorised. ✓ Scale and extent of activities to be authorised. ✓ Typical impacts of activities to be authorised (e.g. surface disturbance, dust, noise, drainage, fly rock, etc.) ✓ The duration of the activity. ✓ Sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land. <p>Other, specify: contact details for the mine and the consultant was also given.</p>
Information to be required from Interested and	Compulsory:-

<p>Affected Parties was covered with a comment form in which the interested or affected party had to identify themselves and in which they had space to list any concerns, comments or objections.</p>	<ul style="list-style-type: none"> ✓ To provide information on how they consider that the proposed activities will impact on them or their socio-economic conditions. ✓ To provide written responses stating their suggestions to mitigate the anticipated impacts of each activity. ✓ To provide information on current land uses and their location within the area under consideration. ✓ To provide information on the location of environmental features on site to make proposals as to how and to what standard the impacts on site can be remedied and requested to make written proposals. ✓ To mitigate the potential impacts on their socio-economic conditions and to make proposals as to how the potential impacts on their infrastructure can be managed, avoided or remedied.
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iii) Summary of issues raised by I&APs

(Complete the table summarising comments and issues raised, and reaction to those responses)

Table 5: Consultation with I&APs

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received	Issues Raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
<u>AFFECTED PARTIES</u>					
Landowner/s	X				
Micoba Plase BK (Mrs JP Ferreira – landowner)	X	21/01/2016	Letter giving Permission to the applicant. No other issues raised.		Consensus
Lawful occupier/s of the land					
No lawful occupier	X	21/01/2016	The owners has given written consent to the applicant.		Consensus
Landowners or lawful occupiers on adjacent properties	X				
Mrs CP Bekker 15 Gen Nieuwoudt Street Fauresmith 9978	X	Not received back yet			
Mrs F Andrews P O Box 653 Hermanus 7200	X	15 March 2016	As there is an existing prospecting/mining right over Kransfontein 19 as well as Kwartelspan 25 and other farms (details unknown) our concern is that the issuing of a new right prior to the cancellation of the existing prospecting/mining right and the issuance of closure certificates/rehabilitation certificates (including fencing between Kransfontein 19 and	There is not another prospecting Right as the DMR would not have accepted another application if there was an existing application. Letter with Map indicating all application after consultation with the DMR will be mailed to the interested party.	The application is on the property of Mrs Andrews Sister (Mrs Ferreira) and not on the property of Mrs Andrews. Saxendrift Mine have a prospecting right on the property of Mrs Andrews.

			<p>Kwartelspan 25) may prejudice my rights in terms of the existing land surface agreement and the existing prospecting and or mining rights.</p> <p>As the existing prospecting/mining right is not mentioned in this notice the notice may be found to be defective for failure to make full disclosure.</p> <p>The locality plan (figure 1 on page 6) has insufficient detail for me to make informed judgements. I would require a locality plan detailing boundaries between Kransfontein 19 and Kwartelspan 25 together with locality of the existing prospecting/mining right (on both farms) and the proposed mining right on Kransfontein 19</p>		
Rockwell Diamonds Saxendrift Mine (Pty) Ltd P O Box 251 Barkly West 8375	X	25/02/2015	Dust emitting from the operation. How do you plan on dealing with the visual impact? How do you plan on extracting water?	E-mail letter with mitigatory measures described and detail on DWS application have been given through to the mine.	Finalized
Oranje Vaal WGV Mrs L Beukes 47 Giddy Street Douglas 8730	X	Not received back yet			
Mr Mattie Lotter P O Box 79 Douglas 8730	X	Not received back yet			
Jasper Mining (Pty) Ltd P O Box 251 Barkly West 8375	X	24/02/2016	No major concerns to the prospecting activity. The activities must be conducted according to the approved EMP and dust suppression must be done accordingly.		Consensus
Municipal Councillor	X				
Municipality	X				
Thembelihle Municipality Private Bag X3 Hopetown 8750	X	Not received back yet			
Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWS					
ESKOM NC Operating Unit P O Box 606 Kimberley 8300	X	Not received back yet			
Department of Agriculture, Forestry & Fisheries P O Box 2782 Upington	X	Not received back yet			

8800					
Department of Water & Sanitation NC Private Bag X6101 Kimberley 8300	X		DWS indicated that the consultant must visit the office to be briefed about the application process.	EAP has visited the DWS office.	WULA application in process of being prepared for submission.
Department of Agriculture & Land Reform Private Bag X5018 Kimberley 8300	X	Not received back yet			
Communities					
No communities					
Dept. Land Affairs					
No land claim					
Traditional Leaders					
No Traditional Leaders					
<u>OTHER AFFECTED PARTIES</u>					
Leonard Albert Petoors 079 974 7045		Attended meeting on 01/03/2016 also the BEE partner in the application.	No issues raised		Consensus
<u>INTERESTED PARTIES</u>					
Berleh Mpho Thepo Seipone Taung 950 Kolohej Village		Attended meeting on 01/03/2016	No issues raised		Consensus
Oradiseng Abel Mphetlela Taung Station 8580 Reanstate Village		Attended meeting on 01/03/2016	No issues raised		Consensus
Kiewiet Elwin Doorze 85 Bree Street Strydenburg Deetlefsville 8765		Attended meeting on 01/03/2016	No issues raised		Consensus

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

(1) Baseline Environment

(a) Type of environment affected by the proposed activity

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

(1) GEOLOGY:

Regional Bedrock Geology

The bedrock of the Orange River valley between the confluence of the Vaal and Orange Rivers at Douglas and Prieska is dominated by flat-flying Dwyka tillite and siltstone of the Karoo Supergroup. The Dwyka, typically, comprises matrix-supported diamictite with both local and transported pebbles and boulders as dropstones in a rock-flour matrix. Underlying the Dwyka, and exposed where the Orange River has incised through that sequence, are lavas of the Ventersdorp

Supergroup, overlain (in places) by sediments of the Transvaal Supergroup, comprising shales, quartzites and dolomites. The bedrock is cut by faults and dolerite dykes, which are rarely exposed. The surface on which the Dwyka was deposited was irregular with several topographic highs.

The present surface of the Dwyka comprises a gently undulating terrain lying at an elevation of between 1,050m and 1,100 amsl. The river has incised into this surface to a depth of between 90m and 150m.

Owing to the irregularity of the pre-Dwyka surface, several reaches of the river are superimposed on pre-Dwyka topographic highs, which, due to their relative resistance to erosion, give rise to more rugged topography. Here the Orange River is confined to gorges with increased river gradients. In contrast, the more easily eroded Dwyka has been dissected by minor tributaries of the Orange River, giving rise to a trellis-type drainage pattern. To the north of the Orange River, the Ghaap Plateau represents an ancient surface of Transvaal Supergroup rocks.

Lower Terraces

Lower elevation terraces (less than about 30m above present river bed) of the Orange River are typified by up to 30% sand matrix with a high proportion of zeolite-rich sand lenses and a high proportion of red Drakensberg basalt clasts. These gravels normally exhibit intermediate to low diamond grades. They are typically cobble-pebble gravels with occasional boulders. Clast composition is dominated by andesite (Ventersdorp lava), dolerite, shale, quartzite, and riebeckite, with a low percentage of agate and amygdales. Downstream of Lanyonvale (Wouterspan) BIF makes up +60% of the clast assemblages.

Clast-rounding is moderate and packing is moderate to poor, both of which impact negatively on diamond entrapment potential. Average grades of 0.5 – 1.2ct/m³ or 0.23 – 0.54 cpht are known with the occurrence of occasional large stones (P Gresse, Pers. Comm., 2005).

The lowest terrace does not appear to be as calcreted as the upper two terraces and mining is, therefore, easier. Lower terrace deposits are generally covered by 1 – 4m of sand whereas the upper terrace deposits are capped by a hard calcrete layer some 2 – 3m thick which protected the gravel deposits from erosion and prevented exploitation in the past.

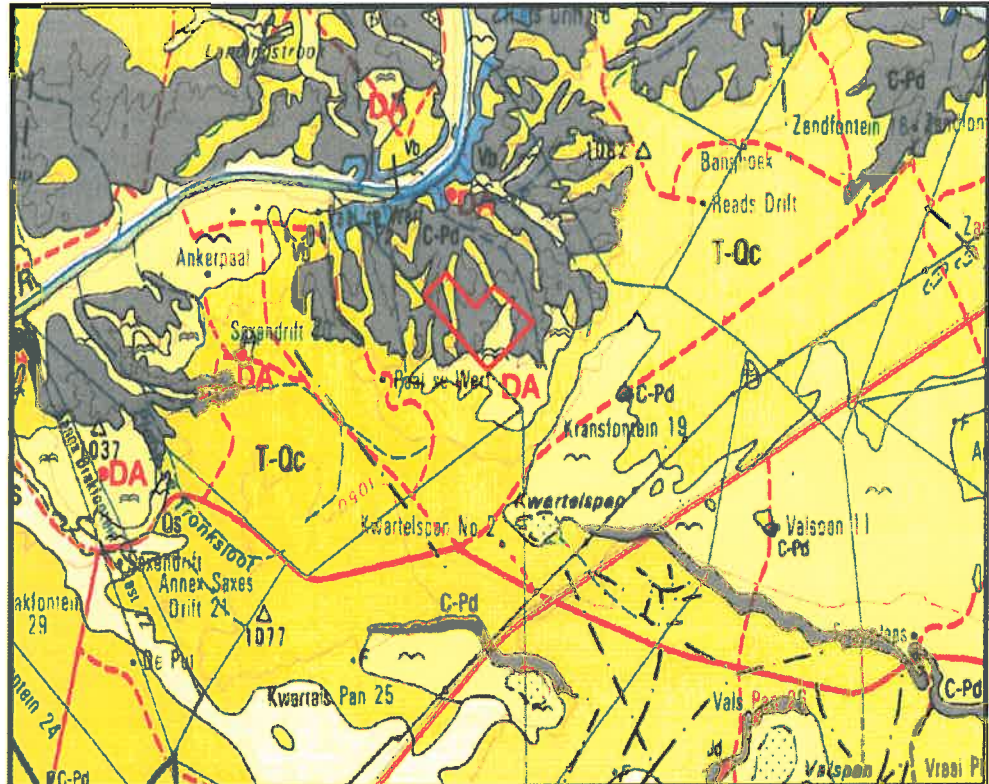


Figure 5: Geological map of a Portion of the Remainder of Kransfontein No. 19, Hopetown

LEGEND GEOLOGICAL MAP (SCALE 1: 250 000)	
Qs	- Sand
T-Qc	- Calcrete
Jd	- Karoo-aged dolerite
Ppr	- Karoo shale
Ra	- Ventersdorp lava
◆	- Kimberlite pipe
—○—	- Kimberlite fissure

(2) CLIMATE:

Regional Climate

The climate of the area is described as semi-arid. The area receives between 250mm and 500mm of rain per annum whilst annual potential evaporation rates varies between 2 600mm and 2 800mm. Rainfall events generally comprise showers and thunderstorms occurring the summer months during October and March (February and March are generally peak rainfall months). The summers are very hot with cool winters. The data from the weather stations at Kimberley will be used.

Rainfall

Average monthly and annual rainfall for the site and number of days per month with measurable precipitation is presented in the table below:

MONTH	60 MINUTES	24 HOURS	24 HOURS IN 50 YEARS	24 HOURS IN 100 YEARS
January	35.8	57	65.1	73.8
February	70.1	82	58.9	66.5
March	63.7	67.8	72.1	81.4
April	25.7	51.6	65.9	75.2
May	14.6	54.6	36.8	42.4
June	19.1	67.5	26	30.4
July	12	26.7	26.6	31
August	17	58.2	23.4	27.3
September	16.3	26.7	24.1	28
October	37.6	59.2	53.8	61.8
November	25.2	60.1	41.2	46.7
December	59.9	64.5	70.7	80.9

Source: Directorate: Climatology South African Weather Bureau Station: 0290468 – Kimberley: 1970-2003

The maximum rainfall intensities are presented in the table below:

MONTH	60 MINUTES	24 HOURS	24 HOURS IN 50 YEARS	24 HOURS IN 100 YEARS
January	35.8	57	65.1	73.8
February	70.1	82	58.9	66.5
March	63.7	67.8	72.1	81.4
April	25.7	51.6	65.9	75.2
May	14.6	54.6	36.8	42.4
June	19.1	67.5	26	30.4
July	12	26.7	26.6	31
August	17	58.2	23.4	27.3
September	16.3	26.7	24.1	28
October	37.6	59.2	53.8	61.8
November	25.2	60.1	41.2	46.7
December	59.9	64.5	70.7	80.9

Source: South Africa (WB42) Station: 0290468 – Kimberley: 1961-1990

Average monthly maximum and minimum temperatures are presented in the table below:

MONTH	DAILY MAXIMUM °C	DAILY MINIMUM °C
January	32.8	17.9
February	31	17.3
March	28.8	15.2
April	24.8	10.9
May	21.4	6.5
June	18.2	3.2
July	18.8	2.8
August	21.3	4.9
September	25.5	8.9
October	27.8	11.9
November	30.2	14.6
December	32.1	16.6
YEAR	26.1	10.9

Source: Directorate: Climatology South African Weather Bureau © 2000 Station: 0290468 – Kimberley: 1960-2000

Wind

The prevailing wind direction for the area is north to north-north-west for the months January to September and changing from north to sometimes westerly winds during October to December averaging 3.5 m/s (Kimberley 01/01/1990 – 31/08/2000, Station 0290468).

Humidity and Evaporation

The average monthly humidity is represented in the table below:

MONTH	AVERAGE (%)	MAXIMUM (%)	MINIMUM (%)
January	47	91	8
February	54	94	12
March	57	96	15
April	60	96	16
May	56	96	16
June	54	97	15
July	49	97	13
August	42	94	10
September	36	91	8
October	39	89	8
November	42	92	8
December	43	90	7
Year	48	94	11

Source: Directorate: Climatology South African Weather Bureau © 2000 Station: 0290468 – Kimberley: 1960-2000

The average monthly evaporation is presented in the table below:

MONTH	EVAPORATION IN mm SYMONS PAN
January	365.6
February	279.1
March	235.8
April	169.1
May	135.1
June	108.6
July	130.1
August	181.2
September	252.6
October	314.9
November	345.5
December	378.6
YEAR	2896

Source: South Africa Weather Bureau Station: 0290468 – Kimberley: 1957-1987

Incidents of Extreme Weather Conditions

- **Hail**
Hail is sometimes associated with thunderstorms and mainly occurs in early to late summer (November to February). It occurs on average three times a year and although these storms may sometimes be severe and cause much damage, they usually impact on a relatively small area.
- **Frost**
The period during which frost can be expected lasts for about 120 days (May to August). With extreme minimum temperatures to below -8°C at night in the winter, frost development can be severe.
- **Droughts**
Droughts are common and may vary from mild to severe. During these periods dust storms sometimes occur, depending mainly on denudation of the surface.
- **Wind**
High winds are unusual but when they do occur can uproot trees and take off roads.

(3) **TOPOGRAPHY:**

The proposed prospecting area is situated in a region of gently undulating hills on the edge of the Karoo, an area of sparse, arid semi desert that occupies much of central South Africa. The area comprises elevated palaeo- river terraces at elevations of between 1,100m and 1,00m above mean sea level (“amsl”), some 60 – 70m above the present Orange River. The terraces are cut by a number of small ephemeral streams dry for most of the year they flow through the application area before they confluence and enter the Orange River. The surrounding terrain is a flat semi-desert environment with sparse grass and occasional shrubs, thorn bushes and succulents in a sandy soil (see Plate below). Bigger trees often line the banks of the Orange River.

Since no exploration or mining activities will be undertaken in the present river channel, bank-full discharge conditions will have no effect on operations. Even during floods, the effect on operations will be negligible, since the modern-day floodplains are not exploration targets.

(4) **SOILS:**

Soil Types

The soil types that may be potentially disturbed include the Litho-soil, the Mispah and the Hutton soil. The depth is 100 – 300mm and the soil types have a low erosion potential. However on a slope these soils could have the potential to erode owing to the gradient. The subsoil will consist of rock such as diamictite, sandstone, shale, grit and conglomerate and quartz-schist. There is also the river terrace gravel, which is largely not erodible.

(5) **PRE-MINING LAND CAPABILITY:**

As a result of a combination of the climate non-rich soils; the topography of the area; and the distance to the nearest surface water, the land lends itself to an activity such as livestock farming.



Plate 2: Typical vegetation cover in the area

(6) **LAND USE:**

Land Use Prior to Mining

Parts of the land was taken over as an existing mine, so there were areas of disturbed land. There were also large areas, which had been mined by early alluvial miners, and this had led to piles of “rooikoppie”

being left scattered throughout this area. The local land use would have been for grazing purposes.

Historically Agricultural Activities

The property had been used for grazing.

The carrying capacity for the area is low. (20 ha/Large Animal Unit (LAU). 1 LAU = 7 Small Animal Units (SAU) i.e. 20 ha for 7 sheep) (Agric. Dept. 1990). This has been re-determined in a current carrying capacity study. The conclusion of this study is that the area could support approximately 1 sheep for every 4.8 ha in an average rainfall year without causing degradation of the veld. It is suitable mainly for goats or sheep.

Kudu (*Tragelaphus strepsiceros*), Steenbuck (*Raphicerus campestris*) and the Common Duiker (*Sylvicapra grimmia*) probably occur.

Evidence of Abuse

Sporadic mounds of “rooikoppie” indicate the activities of old diamond diggings. The hill slopes are very stony and no serious gulleys or other erosion was noted, with exception of that in some of the drainage lines.

Current mining activities have caused a high degree of disturbance in the area however this impact can be mitigated through effective rehabilitation during the prospecting operations.

Existing Structures

The only infrastructure on the farm is the farm house and the old farm house as well as the houses of workers. This does not fall within the application area. On the application area there is the old slabs where the previous mining infrastructure were placed, also the small brick building that is toilets. Old masts where lights were put up and a screening plant.



Plate 3: Existing toilet brick building and lighting pole



Plate 4: Existing cement slabs where the previous recovery was standing with another lighting pole in the back and the scrubber that was left on site by previous miners



Plate 5: The brick toilet structure and lighting poles on the existing disturbed areas

(7) NATURAL FAUNA:

Common Species

The fauna listed below are common species that have previously been found, or have the potential to occur in the mining area.

▪ **Birds**

An extensive bird life can be found on the mine and specifically on the fills and small valleys with dense vegetation growth. A list of birds that have been spotted or are known to occur in the prospecting area, are listed in the table below.

BIRD LIST	
English Name	Scientific Name
Feral Pigeon	<i>Columba livia</i>
Rock Pigeon	<i>Columba guinea</i>
Redeyed Pigeon	<i>Streptopelia semitorquata</i>
Cape Turtledove	<i>Streptopelia capicola</i>
Laughing Dove	<i>Streptopelia senegalenses</i>
Namaqua Dove	<i>Oena capensis</i>
Diederik Cuckoo	<i>Chrysococcyx caprius</i>
Redchested Cuckoo	<i>Cuculus solitaries</i>
Barn Owl	<i>Tyto alba</i>
Pearlspotted Owl	<i>Glaucidiumperiatum</i>
Spotted Eagle Owl	<i>Bubo africanus</i>

Whiterumped Swift	<i>Apus caffer</i>
Little Swift	<i>Apus affinis</i>
Whitebacked Mousebird	<i>Colius colius</i>
Redfaced Mousebird	<i>Urocolius indicus</i>
Brownhooded Kingfisher	<i>Halcyon albiventris</i>
Lilacbreasted Roller	<i>Coracias coudata</i>
Purple Roller	<i>Coracias naevia</i>
Hoopoo	<i>Upupa epops</i>
Scimitar-billed Woodhoopoo	<i>Rhino omastus cyanomelas</i>
Grey Hornbill	<i>Tockus nasutus</i>
Pied Barbet	<i>Tricholaema leucomelas</i>
Crested Barbet	<i>Tricholaema leucomelas</i>
Rufous-naped Lark	<i>Mirafta africana</i>
Clapper Lark	<i>Mirafta apiata</i>
Fawn-coloured Lark	<i>Mirafta africanoides</i>
Chestnut-backed Finchlark	<i>Eremopterix verticallis</i>
European Swallow	<i>Hirundo rustica</i>
Greater Striped Swallow	<i>Hirundo cucullata</i>
Fork-tailed Drongo	<i>Dicrurus adsimilis</i>
Black Crow	<i>Corvus capensis</i>
Pied Crow	<i>Corvus album</i>
Ashy Tit	<i>Parus cinerascens</i>
Pied Babbler	<i>Turdoides bicolor</i>
Red-eyed Bulbul	<i>Pycnonotus nigricans</i>
Groundscraper Thrush	<i>Turdus litsitsirupa</i>
Familiar Chat	<i>Cercomelafamiliaris</i>
Ant-eating Chat	<i>Myrmecocichlaformicivora</i>
Stonechat	<i>Saxicolaporquata</i>
Cape Robin	<i>Cossypha caffra</i>
Kalahari Robin	<i>Erythropygia paeon</i>
Titbabbler	<i>Parisoma subcaeruleum</i>
Fantailed Cisticola	<i>Cisticolajuncididis</i>
Desert Cisticola	<i>Cisticola aridula</i>
Spotted Flycatcher	<i>Muscicapa striata</i>
Chat Flycatcher	<i>Melaenornis infuscatus</i>
Fiscal Flycatcher	<i>Sigelus silens</i>
Cape Wagtail	<i>Motacilla capensis</i>
Orange Striated Langclaw	<i>Macronyx capensis</i>
Lesser Grey Shrike	<i>Lanius minor</i>
Grassveld Pip	<i>Anthus cinnamomeus</i>
Fiscal Shrike	<i>Lanius collaris</i>
Glossy Starling	<i>Lamprotornis nitens</i>
Cape White Eye	<i>Zosterospallidus</i>
White-browed Sparrowweaver	<i>Plocepasser mahali</i>
House Sparrow	<i>Passer</i>
Great Sparrow	<i>Passer motitensis</i>
Masked Weaver	<i>Ploceus velatus</i>
Red-billed Quelea	<i>Quelea quelea</i>
Red Bishop	<i>Euplectes orix</i>
Long-tailed Widow	<i>Euplectesprogne</i>
Melba Finch	<i>Amdina erythrocephala</i>
Quail Finch	<i>Ortygospiza atricollis</i>
Pintailed Whydah	<i>Vidua macroura</i>
Shaft-tailed Whydah	<i>Vidua regia</i>
Black-throated Canary	<i>Merops hirundineus</i>
Yellow Canary	<i>Serinusflaviventris</i>
Kalahari Robins	<i>Erythropygia paeon</i>
Dusky Sunbird	<i>Nectarinia fusca</i>
Common Quail	<i>Coturnix coturnix</i>
Cardinal Woodpecker	<i>Denrapicos fuscescens</i>

White-breasted Cormorant	<i>Phalacrocorax carbo</i>
Grey Heron	<i>Ardea cinerea</i>
Black Headed Heron	<i>Ardea melanocephala</i>
Cattle Egret	<i>Bululcus ibis</i>
Hammerkop	<i>Scopus umretta</i>
Hadedā Ibis	<i>Bostrychia hagedash</i>
Whitefaced Duck	<i>Dendrocygna viduata</i>
Egyptian Goose	<i>Alopochen aegyptiacus</i>
Yellowbilled Duck	<i>Anas undulate</i>
Redbilled Teal	<i>Anas erythrorhyncha</i>
Spurwinged Goose	<i>Plectropterus gambensis</i>
Secretary Bird	<i>Sagittarius serpentarius</i>
Black-breasted Snake Eagle	<i>Circaetus pectoralis</i>
Steppe Buzzard	<i>Buteo buteo</i>
Lanner Falcon	<i>Falco biarmicus</i>
Greater Kestrel	<i>Falco rupicoloides</i>
Lesser Kestrel	<i>Falco naumanni</i>
Orange River Francolin	<i>Francolinus levaillantoides</i>
Helmeted Guineafowl	<i>Numida meleagris</i>
Redknobbed Coot	<i>Fulica cristata</i>
Whitewinged Black Korhaan	<i>Eupodotis aftaoides</i>
Crowned Plover	<i>Vanellus armatus</i>
Blacksmith Plover	<i>Vanellus coronatus</i>
Common Sandpiper	<i>Actitis hypoleucos</i>
Spotted Dikkop	<i>Birhinus capensis</i>
Doublehanded Courser	<i>Smutsornus africanus</i>
Temminck's Courser	<i>Cursorius temminckii</i>
Whitewinged Tern	<i>Chlidonias leucopterus</i>
Burhell's Sandgro	<i>Ptercoles burchilli</i>

▪ Mammals

A list of all the fauna likely to be found at the site is presented in the table below:

MAMMAL LIST	
Scientific Name	Common Name
<i>Suncus infintesimus</i>	Least Dwarf Shrew
<i>Crocidura cyanea</i>	Reddish-grey Musk Shrew
<i>Chlorotohpha sclater</i>	Golden Mole
<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed Bat
<i>Eptesicus capensis</i>	Cape Serotine Bat
<i>Nucleris thebaica</i>	Common Slit-faced Bat
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat
<i>Papio ursinus</i>	Chacma Baboon
<i>Tatera lencogaster</i>	Bushveld Gerbil
<i>Gerbillurus paeba</i>	Hairy-footed Gerbil
<i>Desmodillus aricularis</i>	Short-tailed Gerbil
<i>Mus musculus</i>	Domestic Mouse
<i>Rhabdomys pumilio</i>	Striped Field-Mouse
<i>Saccostomus capestris</i>	Pouched Mouse
<i>Malacothrix typical</i>	Large-eared Mouse (on calcrete)
<i>Graphiuurs ocularis</i>	Spectacled dormouse
<i>Mus minutoides</i>	Pygmy Mouse
<i>Aethomys namaquaensis</i>	Namaqua Rock Mouse
<i>Parotomys brontsij</i>	Bront's Whistling Rat
<i>Otomys unisulcatus</i>	Karoo Bushrat
<i>Thallomys nigricauda</i>	Black-tailed Tree Rat (camel-thorn)
<i>Cryptomys hottentotus</i>	Common Mole Rat
<i>Rattus rattus</i>	Domestic Rat

<i>Lepus capensis</i>	Cape Hare
<i>Lepus saxatilis</i>	Shrub Hare
<i>Pedetes capensis</i>	Springhare
<i>Pronologus ruperstris</i>	Smith's Red Rock Rabbit
<i>Helogale parvula</i>	Dwarf Mongoose
<i>Cynictis penicillata</i>	Yellow Mongoose
<i>Atilax paludinosus</i>	Water Mongoose
<i>Galerella sanguniea</i>	Slender Mongoose
<i>Ictonyx striatus</i>	Striped Polecat
<i>Genetta genetta</i>	Small Spotted Genet
<i>Xerus inauris</i>	Ground Squirrel
<i>Funisciurus congicus</i>	Striped Ground Squirrel
<i>Atelerix frontalis</i>	Cape Hedgehog
<i>Felis caracal</i>	Caracal
<i>Felis lybica</i>	African Wild Cat
<i>Felis nigripes</i>	Small Spotted Cat
<i>Otocyan megalotis</i>	Bat-eared Fox
<i>Vulpes charma</i>	Cape Fox
<i>Canis mesomelas</i>	Black-backed Jackal
<i>Hystrix africanaustralis</i>	Porcupine
<i>Orycteropus afer</i>	Aardvark
<i>Phacochoerus aethiopicus</i>	Warthog
<i>Manis temniinckii</i>	Cape Pangolin
<i>Suricata suricatta</i>	Meerkat
<i>Sylvicapra grimmia</i>	Common Duiker
<i>Raphicerus campestris</i>	Steenbok
<i>Tragelaphus strepsiceros</i>	Kudu

Endangered Species

The fauna listed below are endangered species that are most likely to occur in the area according to the Red Data Book – Birds (Barnes, Keith N, 2000) and the Red Data Book – Mammals (Smithers 1989 & Branch 1988). The following definitions apply:-

Vulnerable

Taxa of which all or most populations are decreasing because of: over exploitation, extensive destruction or degradation of their habitat or other environmental disturbances. This means that the species is considered to facing a high risk of extinction in the wild.

Rare

Taxa with small population sizes, which are not permanently endangered or vulnerable; but are potentially at risk.

▪ Endangered Mammals

Scientific Name	Common Name	Status
<i>Aonyx capensis</i>	Cape Clawless Otter	Unknown
<i>Felis lybica cafra</i>	African Wild Cat	Vulnerable
<i>Manis temminckii</i>	Cape Pangolin	Vulnerable
<i>Orycteropus afer</i>	Antbear	Vulnerable
<i>Atelerix frontalis</i>	Cape Hedgehog	Rare
<i>Naja nigricollis woodi</i>	Black Spitting Cobra	Rare
<i>Proteles cristatus cristatus</i>	Aardwolf	Rare
<i>Felis nigripes nigripes</i>	Small Spotted Cat	Rare

▪ **Endangered Birds**

Scientific Name	Common Name	Status
<i>Gyps coprotheres</i>	Cape Vulture	Vulnerable
<i>Gyps africanus</i>	African Whitebacked Vulture	Vulnerable
<i>Torgos tracheliotos</i>	Lappetfaced Vultures	Vulnerable
<i>Aquila rapax</i>	Tawny Eagle	Vulnerable
<i>Polemactus bellicosus</i>	Martial Eagle	Vulnerable
<i>Anthropoides paradiseus</i>	Blue Crane	Vulnerable
<i>Ardeotis kori</i>	Kori Bustard	Vulnerable
<i>Neotis ludwigii</i>	Ludwig's Bustard	Vulnerable

(8) **NATURAL VEGETATION:**

According to Hoffman (1998) the area falls into the Nama Karoo Biome, and this area specifically is part of the Orange River Nama Karoo (51). The dominant vegetation is a grassy, dwarf shrub land. Grasses tend to be more common in depressions and on sandy soils, and less abundant on clayey soils. Grazing rapidly increases the relative abundance of shrubs.

The dominant species in the mine area are: *Acacia meliifera* subsp. *detinens*, *Acacia tortilis* subsp. *heteracantha*, *Boscia albitrunca* subsp. *albitrunca*, *Stipagrostis iniplumis*, *S.obtusa*, *Enneapogon desvauxii*, *E. scoparius*, *Rhigozum trichotomum*, *Ziziphus mucronata* subsp. *mucronata*, *Zygophyllum* species.

The Nama Karoo biome is located entirely on the central Plateau mostly at altitudes between 1 000m and 1 500m. It incorporates nearly the whole of the historical and geographical Great Karoo, but also includes a portion of southern Namibia's "Namaqualand", and South Africa's "Bushmanland" (both geographical names, not names of biomes). It is the second largest biome in South Africa, and forms the botanical transition between the "Fynbos biome" to the south and the "Savannah biome" to the north. It is defined primarily by the dominance of dwarf (less than 1m high) shrubs with a co-dominance of grasses especially towards the north-east and east where it grades into the "Grassland biome" of the Highveld and the Eastern Midlands. The shrubs and grasses are deciduous, mainly in response to the irregular rainfall. Much of the Nama Karoo biome is used for sheep and goat farming, providing mutton, wool and pelts for local international markets, especially since livestock can frequently be provided with a regular supply of water from boreholes.

Overgrazing exacerbates the erosion caused by the violent thunderstorms that occur, infrequently, in the summer. It also promotes the replacement of the grasses by shrubs, especially the less edible varieties such as the Threethorn (*Rhigozum trichotomum*), Bitterbos (*Chrysocoma ciliate*) and Sweet Thorn (*Acacia karoo*). However, there are few rare or Red Data Book plant species in the Nama Karoo biome. Tourism potential is low. Mining is important in the biome (Low and Rebelo, 1998).

There are very few rare or Red Data Book plant species in the Nama Karoo Biome (Hoffman, T. 1998). No rare or endangered species are known from the mine area except for the two *Boscia*'s that were seen and identified. *Lithops* species could occur if there were outcrops of quartz or gneiss, but there are no such outcrops in the area. The protected plants, which occur in the area, are *Hoodia gordonii*, *Nymania capensis* namely *Boscia albitrunca*, and *Aloe claviflora*.

There are a number of invaders or exotic species present. These include *Prosopis glandulosa* var. *glandulos* (Mesquite), *Prosopis velutina* (Velvet Mesquite), *Nicotiana glauca* (Wild tobacco), *Agave Americana* (American agave), *Opuntia imbricate* (Imbricate prickly pear), *Cereus peruvianus* (Queen of the Night), *Schinus molle* (Pepper Tree), *Opuntia ficus-indica* (Normal Prickly Pear), and *Argemone subfusiformis* (Mexican Poppy).

On my site visit to the prospecting area very little natural occurring plant species have been noted in the area, and lots of *Nicotiana Glauca* (Wild tobacco trees) have invaded the area because of the previous mining activities.



Figure 6: There are two separate and independent Karoo biomes, or botanical regions, of South Africa that bear the name "Karoo": the Succulent Karoo to the west of green line, and the Nama Karoo to the east [from Wikipedia, the free encyclopedia]

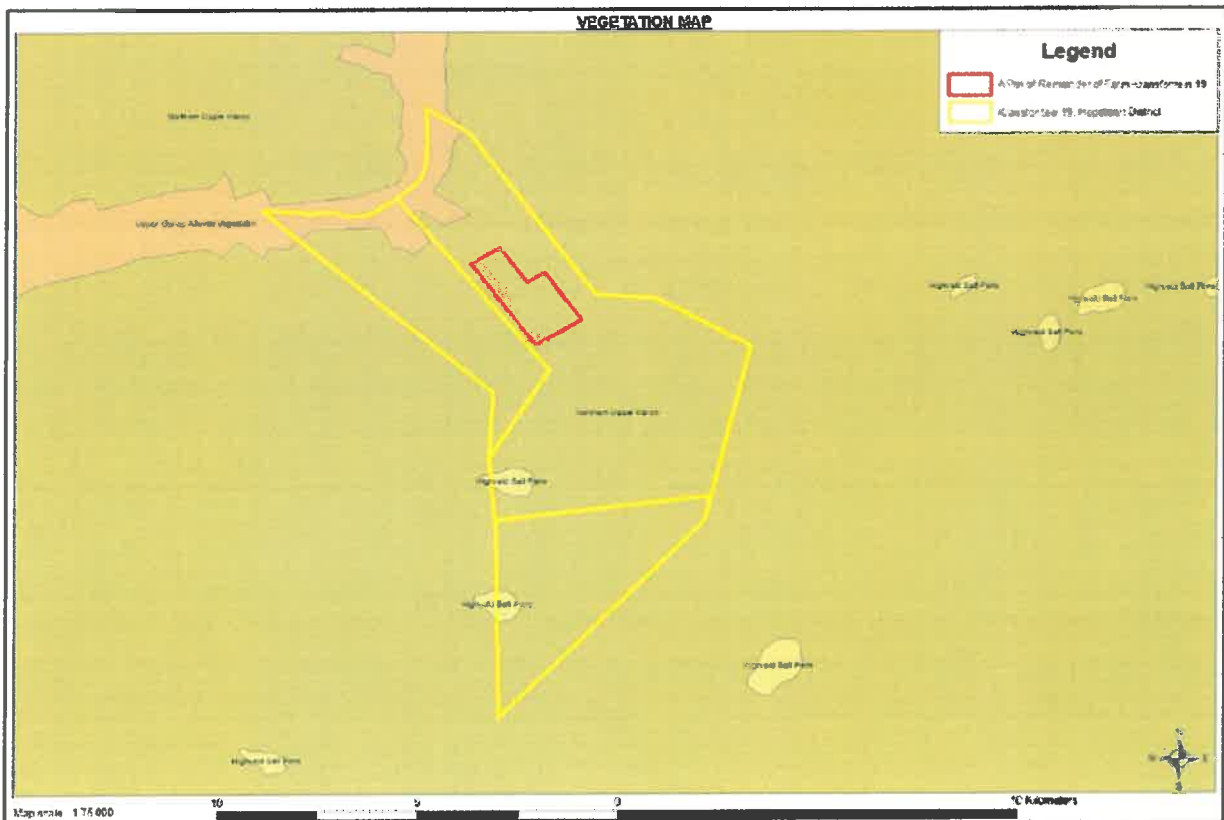


Figure 7: Vegetation map of Kransfontein

(9) **SURFACE WATER:**

Water Resource Sensitivity

The Orange River is about 4km from the application area. Within the area concerned, there are some small streams, part of the dendritic drainage towards the Orange River. These are dry for most of the year and only for a short while following good rains. The only use of these streams during the few days that they do flow would be as drinking source for any game or sheep in the area.

The DDR operation is situated within the quaternary drainage catchments D71C Sub-Catchment. The Sub-Catchment forms part of the Lower Orange Water Management Area.

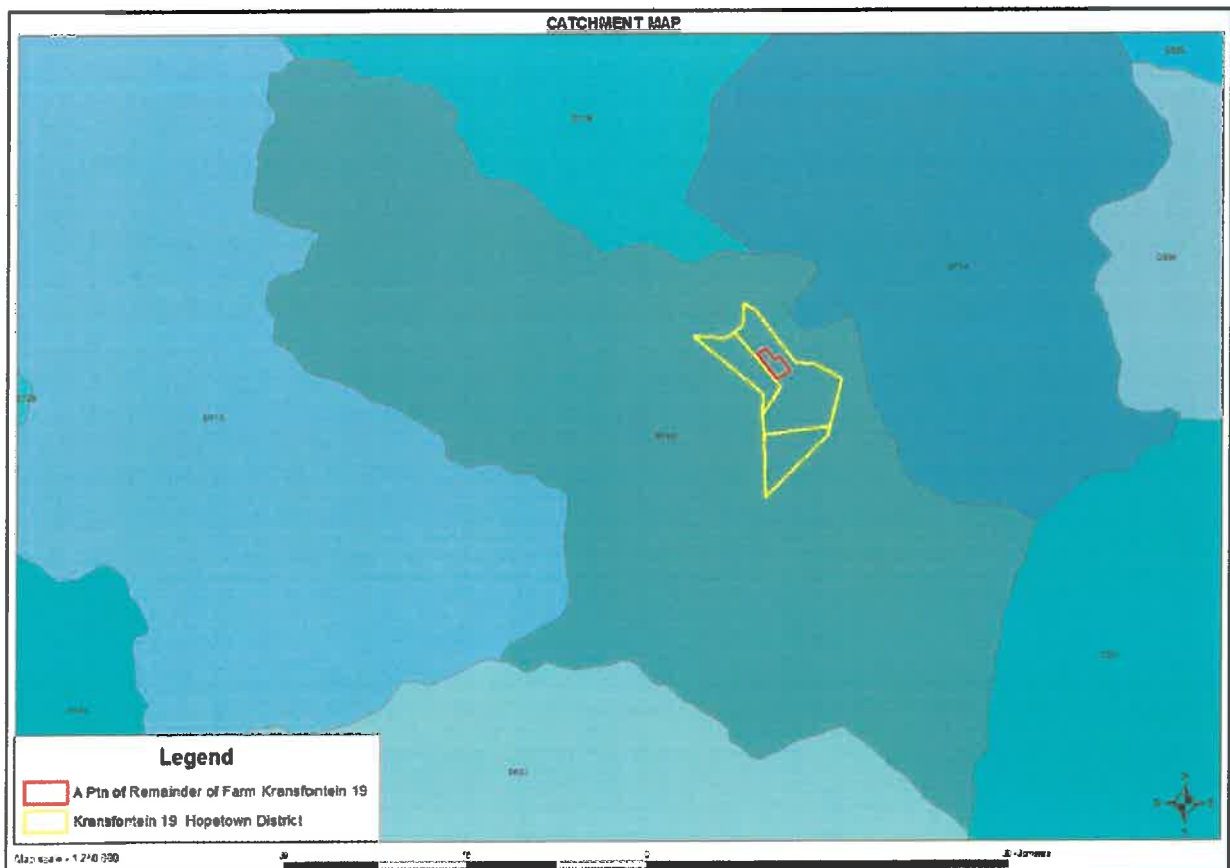


Figure 8: Quaternary Catchment Map

Water Quality

The overall health of the Orange River is poor. Numerous natural and anthropogenic influences have changed the structural, species compositional and functional characteristics of the river.

The salinity of the Orange River is 250 mS/m and the high sulphate (280mg/l), magnesium (110mg/l), chloride (370mg/l) and nitrate (29mg/l) content of the Orange River water indicates a fairly disturbed water body.

Wetlands

No natural wetlands occur on the proposed prospecting area except for the numerous reed beds along the banks of the Orange River. No prospecting will occur in any drainage channels and all prospecting will be aimed at the already disturbed areas.

(10) GROUND WATER:

The mean depth of the water table during summer is approximately 120m and during winters 140m.

Ground Water Zone

It is not anticipated that ground water plays a significant role in the study area. The river is the primary source of water for most activities.

The area between Douglas and Prieska is criss-crossed by dolerite dykes which could act as barriers to water seepage from mine sites. These thin impersistant dykes in the proposed prospecting area will not affect ground water movement significantly. The depth of the boreholes indicates ground water being an important factor in the area. There are no usable boreholes on the prospecting area.

Operation Demand

Processed Water

The processed water and mine residue deposits will form part of a closed dirty water system and will not be allowed back into the Orange River. Water for processing operations will be sourced from the Orange River.

(11) **CULTURAL AND HERITAGE RESOURCES:**

A heritage study was done in 2005 when the first mining activities took place on the same property and area. The artefacts seen during the survey were all from dug-over un-stratified contexts and have therefore no heritage value (*please see Report from Peter B Beaumont attached*).

Should any other heritage features and/or objects be located or observed, a heritage specialist will be contacted immediately. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that a heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This is true for graves and cemeteries as well. If the prospecting operation is approved, the heritage resources if any other had been encountered will be protected through the demarcation of no-go zones and fencing off.

(12) **AIR QUALITY:**

With reference to the Scheduled Processes under the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965), no schedule process relates to any proposed mining activity.

Existing Sources

The current source of air pollution in the area stems from numerous mining operations along the Orange River and from vehicles travelling on the gravel roads of the area. Farming activity, especially ploughing of the irrigation fields, may generate dust during certain periods of the year.

New Source

The source of air pollution of the farm will be nuisance dust generated by the opencast mining process, the loading of gravels onto the transport trucks, the dumping of gravels over each sites primary screen or feeder bins as well as from the movement of trucks and vehicles on the mining roads. Gas emissions from machinery will be kept within legal limits.

Areas of Impacts

The prevailing wind (occasionally slightly) is from the east (June & October) and the south-west (October – January) but the strongest

winds are from the north-west. The average monthly wind speeds are generally below 6.3 m/s.

There is a potential for fall-out dust to impact on the surrounding farm properties – which can be described as the nearest potential area of impact. The dust management programme recommended should include daily dosing of access roads and stockpile areas.

If dust is generated, it is expected to be visible from the surrounding farmland or mines along the Orange River.

(13) **NOISE:**

Noise on site will come from the large vehicles (tip trucks, front-end loaders, back actors) from the working pans.

There are numerous mining operations on both sides of the prospecting operation as well as across the Orange River. Although these operations do generate noise the overall impact can be described as negligible.

(14) **VISUAL ASPECTS:**

The prospecting area is visible from the other side of the Orange River and to the neighbour to the west of the prospecting area. There are no residential areas within the surrounding area. The mine is not located on any tourist route and will be visible to the average tourist.

(15) **SOCIO-ECONOMIC STRUCTURE OF THE REGION:**

(a) **Population Density, Growth and Location**

The Northern Cape is geographically the largest province in South Africa having a land mass increased from 361,830 km² to 373,239 km² with the introduction of the new provincial boundaries and covers approximately one third of the country's surface area.

The Northern Cape is divided into five district councils, namely Namakwa, Siyanda, Pixley ka Seme, Frances Baard and Kgalagadi. These district councils are made up of 27 local Municipalities. The province only has five district management areas.

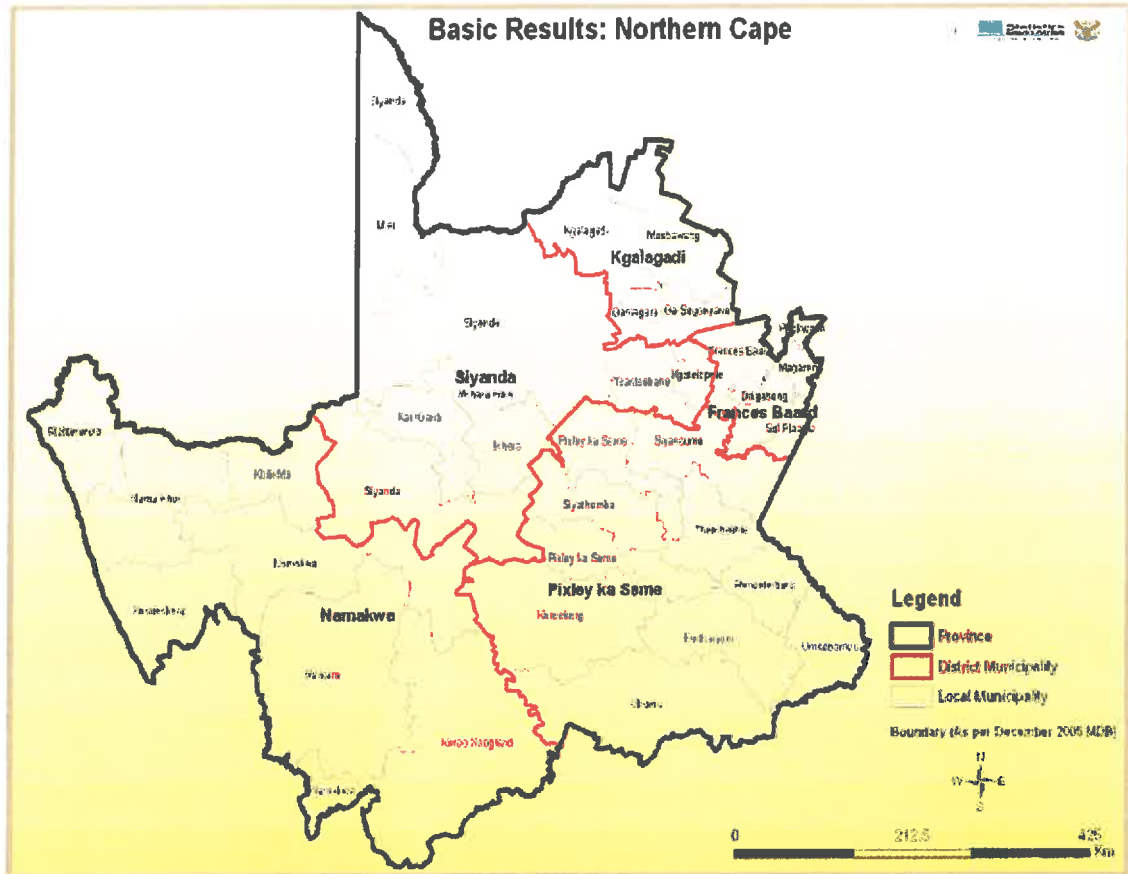


Figure 9: Local Municipal areas in the Northern Cape Province

The Siyancuma Municipality and the Siyathemba Municipality forms part of the Pixley ka Seme District Municipality which is located in the south-eastern part of the Northern Cape Province.

The Siyancuma Municipality is made up of three main entities, namely incorporating three urban settlements (Douglas, Griekwastad and Campbell), two restitution areas (Schmidtsdrift and Bucklands), rural areas (Plooyburg, Salt Lake, Witput, Belmont, Graspan, Heuningskloof, Volop), commercial farming areas, small farming areas, the Ghaap Mountain and small private game parks.

The Municipality is characterised by incorporating the confluence of South Africa's largest rivers, the Orange and Vaal Rivers, with rich mineral deposits (diamonds, tiger's eye, zinc, lead and copper).

The Municipality has relatively high levels of basic services, partially integrated society, medical facilities in Douglas and Griekwastad, one of the biggest prisons in the province and is the neighbour to Kimberley, the provincial and legal capital of the province. It still has major inequalities to overcome and in common with the rest of the country, a skew and sluggish economy to transform and speed up.

Douglas

This town is situated 100km west of Kimberley on the R375 road that connects Prieska (Siyathemba Municipality) and Kimberley.

It has three main residential areas and they are Bongani, Breipaal and the Douglas CBD.

The town is also known because of the confluence of the Vaal and Orange Rivers. It has summer rainfalls with annual rainfall average of 315mm per annum. The area's temperatures vary between 1,7°C in Winter and 34,8°C in Summer.

Douglas is the economic hub of the municipality. It is divided along racial lines by industrial areas and the Vaal River.

Since 1996 the local municipality has spent most of its budget to provide basic infrastructure in the poor areas to catch up with service backlogs, with excellent and visible results. However, the influx of unskilled people from farms has and is still continuing.

The agriculture sector, community, social and personal service sector is the strongest economic sector and biggest job provider in this town. Key service sector employers include agricultural entities, provincial and local government, education and health facilities, the local prison, services to the agricultural sector and financial services.

Griekwastad

Griekwastad is situated 150km west of Kimberley on the main route between Kimberley and Upington.

It is also ideally situated on the route to Witsand and the Siyanda District, thus making it ideal for the development of the town into a tourist stopover in future.

There are four main residential areas in the town and they are Mathlomola, Rainbow Valley, Charlesbeespark and Griekwastad CBD. Griekwastad is the most racially integrated town in the municipality with very low economic activity.

As in the case of Douglas, the local municipality, since 1996, spent most of its budget to provide basic infrastructure in the poor areas to catch up with service backlogs, with excellent and visible results. However, the influx of unskilled people from farms has and, is still continuing.

The agriculture sector, community, social and personal service sector is the strongest economic sector and biggest job provider in this town. Key service sector employers include agricultural entities, provincial and local government, education and health facilities, services to the agricultural sector.

Campbell

Campbell is situated 104km west of Kimberley between Kimberley and Griekwastad on the route to Upington. This whole area's total land is about 900 ha and the majority of the people in the area are the Griekwas.

As in the case of Douglas and Griekwastad, the local municipality, since 1996, spent most of its budget to provide basic infrastructure in the poor areas to catch up with service backlogs, with excellent and visible results. However, the influx of unskilled people from farms has and is still continuing.

The agriculture sector, community, social and personal service sector is the strongest economic sector and biggest job provider in this town. Key service sector employers include agricultural entities, provincial and local government, education facilities.

Douglas which is 30km from Campbell is the business centre for the people of Campbell. Children attend secondary school in Douglas; people have to travel to Douglas for doctors and other personal services.

According to a study done by the Pixley ka Seme District Municipality, Campbell is the poorest community in the Municipality and one of the poorest in the country. Campbell has a strong rural character and is mainly a dormitory town for workers in Douglas and elsewhere.

Smaller Settlement on Privately-Owned Land (Rural Villages)

The smaller settlements in the municipal area are: Plooyburg, Belmont, Witput, Volop and Salt Lake. The total population in these towns is estimated to be below 1,000 people. The settlements have poor linkages with the rest of the towns in the municipal area and the province. Plooyburg is situated on private land which belongs to the Dutch Reformed Church. Water services in Plooyburg have been and are still administered and provided by the church council. Witput, Belmont and Graspan are small railway towns where most of the land and water services infrastructure are owned by Spoornet, the rail parastatal. Spoornet stopped the provision of water services since alienation of the smaller railway stations some years ago. The

remaining households in Belmont, Witput, Graspan and a portion in Salt Lake presently depend on private landowners in the area to obtain water supplies.

The municipality, however as the water services authority (WSA) engaged on this matter and started negotiations with Transnet Housing on the transfer of ownership of houses and infrastructure. These negotiations are to be concluded in the year 2005. Salt Lake is a privately owned farm with a salt manufacturing plant. The community resides on two farms, Saratoga and Sunnydale. Both owners of the farms presently provide water services and housing to residents that have been living in the area for years.

Proposals were also made and negotiations started on the transfer of ownership of the houses to residents. The matter is currently taken up with the provincial Department of Housing and Local Government (DHLG).

Farm Settlements (Other Privately-Held Farmland)

Farm settlements are comprised of very small settlements scattered over the Hay and Herbert Magisterial districts and Vaal River areas.

Households are made up of mostly farmers, farm workers and their families. A few white families own the land occupied by the farm worker families.

The landowners of a particular farm provide water services to the households on the farms. It is also believed that many of the farm worker families are responsible for their own water service's needs.

Restitution Settlements (Rural Villages)

There are two restitution settlements in Siyancuma, namely, Schmidtsdrift and Bucklands. The title deeds for both Schmidtsdrift and Bucklands were recently handed over to the community by the Department of Land Affairs. Households in Schmidtsdrift occupy informal sites in the area. The Municipality presently provides water services to about 250 – 300 households (claimants) in Schmidtsdrift. Water services are of temporary nature at present.

The process of town establishment is at the final stage and was driven and funded by the Department of Land Affairs through the Land Claims Commission. Notice of the township settlement was given at the end of the year 2004 and the community participated successfully through workshops and influenced the whole process positively to their satisfaction.

The process is now for finalisation with the relevant authorities. The Bucklands restitution consists of 21 farms of which 9 belonged to the State has been finalised and successfully transferred to the claimants. The remainder is still in the hands of white commercial farmers.

The majority of claimants (farm workers and squatters) do not reside on the land, but in Douglas. Water services are currently provided by partly the municipality and landowners.

It is also believed that many of the farm worker families are responsible for their own water service's needs.

Table 6: Population distribution by municipality – Census 2001 and CS 2007

Municipality	Population			% distribution	
	Census 2001	CS 2007	% change	Census 2001	CS 2007
DC6: Namaqualand	108 111	126 494	17,9	10,9	12,6
NC061: Rietvlei Local Municipality	10 136	14 613	44,3	1,0	1,4
NC062: Nama Khoi Local Municipality	44 750	64 544	22,1	4,5	5,2
NC064: Kamiesberg Local Municipality	10 754	12 117	12,7	1,1	1,1
NC065: Hantam Local Municipality	19 513	21 234	7,2	2,0	2,0
NC066: Karoo Hoogland Local Municipality	10 512	10 420	-0,9	1,1	1,0
NC067: Khai-Ma Local Municipality	11 344	12 571	10,8	1,1	1,2
NCDMA06: Namaqualand	813	697	-10,4	0,1	0,1
DC7: Pixley ka Seme	164 907	166 849	1,4	16,3	15,8
NC071: Ubuntu Local Municipality	16 375	16 158	-1,4	1,7	1,5
NC072: Umsobomvu Local Municipality	23 941	21 962	-7,0	2,4	2,1
NC073: Emthanjeni Local Municipality	35 546	36 228	1,9	3,6	3,6
NC074: Kareeberg Local Municipality	9 456	9 597	1,5	1,0	0,9
NC075: Renosterberg Local Municipality	9 070	9 155	1,3	0,9	0,9
NC076: Thembelille Local Municipality	13 987	13 218	-5,5	1,4	1,2
NC077: Siyathemba Local Municipality	17 512	20 120	14,9	1,8	1,9
NC078: Siyancuma Local Municipality	35 810	35 970	0,4	3,8	3,4
NCDMA07: Pixley ka Seme	3 175	2 116	-33,4	0,3	0,2
DC8: Siyanda	202 190	239 993	17,8	20,4	22,5
NC081: Iler Local Municipality	5 544	7 337	7,2	0,7	0,7
NC082: Kai !Garis Local Municipality	55 702	55 501	-0,4	5,6	5,3
NC083: Nyhara Hais Local Municipality	75 071	100 920	33,4	7,8	9,5
NC084: Kheis Local Municipality	15 124	16 920	17,3	1,8	1,8
NC085: Tsantsabane Local Municipality	23 657	26 005	10,7	2,4	2,6
NC086: Kgatelopele Local Municipality	14 743	21 498	45,3	1,8	2,0
NCDMA08: Siyanda	9 990	4 562	-46,9	0,9	0,5
DC9: Frances Baard	325 503	353 200	8,5	32,3	33,4
NC091: Sol Plaatje Local Municipality	201 465	243 018	20,9	20,3	23,0
NC092: Dikgatlong Local Municipality	25 765	40 752	57,8	3,6	3,9
NC093: Magareng Local Municipality	21 734	20 433	-6,0	2,2	1,9
NC094: Phokwane Local Municipality	81 321	45 409	-44,3	6,2	4,4
NCDMA09: Frances Baard	5 218	2 568	-50,4	0,5	0,2
DC05: Kgalagadi	191 539	173 454	-9,4	18,2	16,4
NC453: Gamagara Local Municipality	23 202	28 054	20,9	2,3	2,7
NC451: Moshaweng Local Municipality	91 705	70 012	-23,7	9,2	6,5
NC452: Ga-Segonyana Local Municipality	70 382	69 791	-0,9	7,1	6,5
NCDMA05: Kgalagadi	5 237	5 367	2,5	0,5	0,5
Northern Cape	391 519	405 950	3,7	100	100
South Africa	44 219 778	46 552 958	5,3	100	100

Note: All the above figures are based on the new provincial and municipal boundaries

About 33% of the Northern Cape's population are African/Black, 52% are Coloured, 0,3% are Indian/Asian and 13% are White. The province's Coloured population is the largest after that of the Western Cape. Among people aged 20 years and above, almost 21% have had no schooling at all, whilst more than 20% have had some primary

education. Only 5,8% of the province's people have tertiary qualifications. More than 11% have a matric, almost 31% have had some secondary education and around 9% have completed their primary education.

Of all the people in the Northern Cape, 2,2% have sight disabilities, 0,7% having hearing difficulties, 1,1% have physical disabilities, 0,5% have mental abilities and 0,3% suffer from more than one disability.

The Herbert magisterial district is one of six in the Diamantveld district council. The Herbert district have 8 communities with a total population of 21 048 of which 4 800 lives in Rietvale and 4 600 in Motswedmose ±14 kilometers south-east of the mine. The other communities are Plooyburg with 93 people, Bongani – 3 200 people, Breipaal – 4 605 people, Campbell – 2 100 people, Douglas – 1 200 people and Salt Lake – 450 people. The population growth rate for these towns is between 0 and 3.8%.

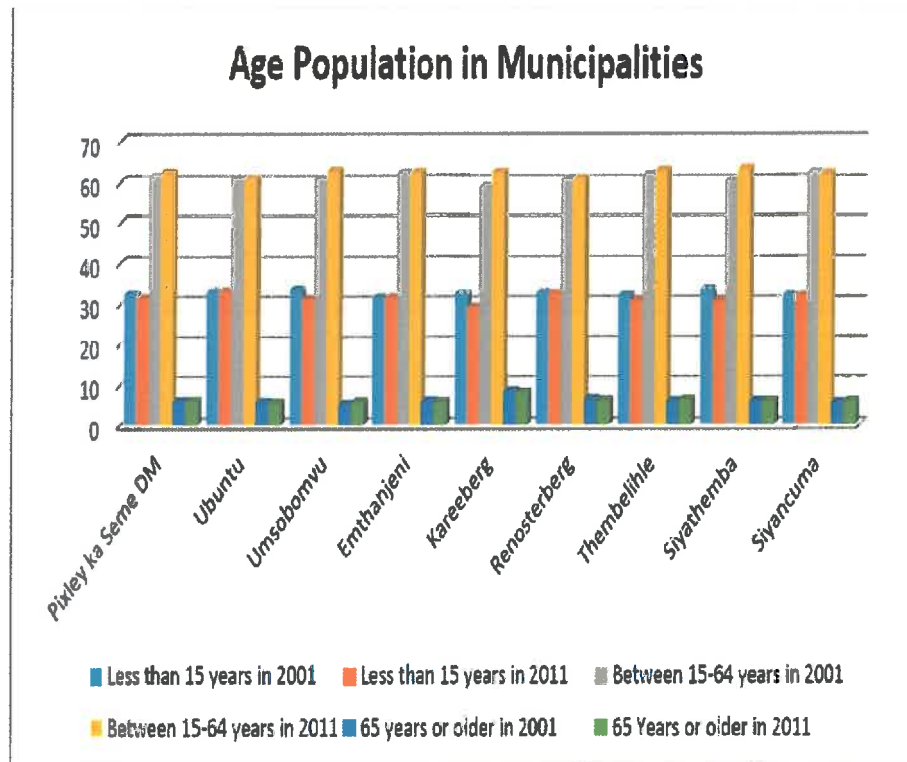


Figure 10: Population by age
Statistics SA Census 2011

(b) Major Economic Activities and Sources of Employment

The economy of this region is not well diversified. In the semi-arid areas of the region small stock and game farming predominates, with few alternative employment opportunities outside of agriculture and

government. This makes the region vulnerable to the strong fluctuating conditions of the agricultural markets. The region is a long-term provider of migrant labour with young people leaving in search of work.

Most of the areas rural population is employed in the agriculture as farm workers as well as on the alluvial diamond mines along the Orange River.

(c) Estimated Unemployment

Being a farming area most people living in the immediate area are employed on the farms.

(d) Housing Demand and Availability

The demand for housing in the Northern Cape Province is critical as can be seen in the number of informal settlements being built on an almost daily basis in the nearby towns and Kimberley.

(e) Household Access to Services

There is no formal infrastructure such as schools, hospitals, sport- and recreation facilities and shops within the surrounding area. The town of Douglas is the nearest with infrastructure to the mine.

▪ **Water**

Water is available to almost 50% of the population in the Northern Cape in the form of water piped to their dwelling. The next most used source of water supply is piped on-site or in yards, which is available to around 33% of the population.

Surface water from the Riet-, Vaal- and Orange Rivers is the major source of water in the region, although some smaller communities are totally dependent on ground water for supply. The source for production and domestic water for the mine will be from the Orange River.

▪ **Sanitation**

The production of households using pit latrines decreased from 18,4% in 2001 to 14,4% in 2007.

However, seven of the municipalities recorded an increase: Karoo Hoogland, Usombomvu, Renosterberg, Thembelihle, Siyathemba, Mier and Kai !Garib. Khai-Ma local municipalities recorded the lowest proportion (0,3%), followed by Tsantsabane (2,7%).

The proportion of households using the bucket toilet system decreased from 10,0% in 2001 to 4,4% in 2007. Only four municipalities namely, Kareeberg (32,8% to 38,1%), //Khara Hais (6,8% to 9%), !Kheis (0,5% to 6,0%) and Gamagara (0,4% to 1,4%) recorded an increase.

▪ **Electricity**

Electricity for Lighting

The proportion of households using electricity for lighting increased from 72,4% in 2001 to 86,8% in 2007 at provincial level. All the local municipalities recorded an increase. Moshaweng and Kamiesberg municipalities recorded significant increase from 34,1% in 2001 to 85,6% in 2007 and 48,2% in 2001 to 85,2% in 2007 respectively.

Electricity for Cooking

The proportion of households using electricity for cooking increased from 54,1% in 2001 to 77,2% in 2007. This trend was recorded in all local municipalities.

Electricity for Heating

All the local municipalities, except Renosterberg and Thembelihle municipalities recorded an increase in the proportion of households using electricity for heating. Fifteen of the 27 municipalities scored above the provincial average. However, five of the municipalities, namely, Umsobomvu (39,8%), Mier (34,0%), Moshaweng (15,8%), Renosterberg (33,1%) and Thembelihle (38,9%) were way below the provincial average.

▪ **Solid Waste Management**

Solid waste can be defined as any garbage, refuse, sludge or other discarded material resulting from industrial, commercial, institutional and residential activity.

The proportion of households whose refuse was regularly removed by local authority/private company increased from 62,6% in 2001 to 72,2% in 2007. Only three out of 27 local municipalities recorded a decrease. The three municipalities were Emthanjeni (from 86,7% in

2001 to 83,9% in 2007), Siyathemba (from 83,1% in 2001 to 83,0% in 2007) and Tsantsabane (from 83,0% in 2001 to 77,6% in 2007).

(f) **Poverty Indicators**

Table 7: Population living below the minimum living levels

Local Municipality	Population	Population below MLL	% below MML
Emthanjeni	35 438	18,418	51.97
Kareeberg	9 356	5,433	58.07
Renosterberg	9 091	5,616	61.77
Siyancuma	35 894	22,559	62.85
Siyathemba	17 497	9,374	53.58
Thembelihle	13,716	3,843	28.02
Ubuntu	16,480	10,787	65.46
Umsobomvu	23,747	20,400	85.91
Total	164,412	98,064	59.65

[Statistics SA Census 2011]

Poverty

The table above shows that an average of 53,58% of the population in the Siyathemba municipal area lives below the minimum living level (MLL). This is an indication of a high level of poverty in the region.

(16) **SOCIAL INFRASTRUCTURE: SCHOOLS, HOSPITAL, SPORT- AND RECREATION FACILITIES, SHOPS, POLICE AND CIVIL ADMINISTRATION:**

Health Overview

The sectoral approach that was adopted to analyse the present health facilities of the Pixley ka Seme district revealed that the National Government has adopted a primary health care strategy that includes making such services available within walking distance of communities.

The strategy also includes making such services available within walking distance. The strategy also includes improvement in sanitation and drinking water supply, etc. Thus the health care systems that presently exists in the District consist of:

- o Provincial Hospital
- o Provincial Clinics
- o Municipal Health Centres or Clinics

Public Transport

Transport includes activities such as, providing passenger or freight transport by rail, road, water or air, auxiliary activities such as terminal parking facilities, cargo handling and activities, and postal activities and telecommunication.

The people in town use micro-buses, private cars as well as walking to go to their places of employment.

As far as public taxis are concerned they operate mostly during the morning hours when the workers are going to work and in the afternoon when they are going back from work to their respective homes.

Road transport comprises private users, business, commerce, farming, government, goods transport agencies and the few public transport operators.

Traffic Management System

The municipality does not have a traffic department. The provincial traffic department provides an ad hoc traffic service in the municipality. The police departments in the three towns support the provincial department with traffic related duties and incidents.

Traffic signs on provincial and district roads are generally adequate and in good condition. There is a lack of traffic signs in the unpaved areas in all three towns. Traffic markings (stop and lane signage) on paved streets are seldom adequate and generally unclear, especially in Douglas and Hopetown.

Rail Transport

No passenger train service is currently operating in the municipality. Transport of goods by rail between Kimberley and Douglas is irregular.

Air Transport

Light air transport facilities are available for all towns. The private sector, namely private doctors, business men use these facilities.

Public Utilities (Services)

Collective utilities (services) are those services consumed off-site, to satisfy either community or domestic service needs. Community service needs include movement, drainage, public safety, market trading and social interaction.

Collective services include water supply in the form of collective standpipes, sanitation in the form of public toilets, solid waste removal in the form of rubbish collection points, communications in the form of public telephones and post collection points, etc. Collective utility points (e.g. public standpipes, public telephones, post collection points, solid waste collection points and public toilets) should be clustered around public markets and open spaces, to create favourable small scale manufacturing and trading conditions. Where these utilities perform residential functions as well, residents are enabled to satisfy several needs in a single trip.

Changes for Growth and Development

The examination and analysis of the socio-economic indicators listed above indicate without any doubt that the most critical challenge facing the district is the reduction of poverty. Other challenges that the district must confront, but which in themselves will also address poverty, includes the following:-

- Ensuring that all citizens have access to basic services such as water, sanitation, electricity and housing.
- Increasing access to services in education, health and social services.
- Stabilizing and decreasing the rate of HIVA and AIDS infection, tuberculosis, FAS, etc.
- Reduction in the rate of crime.
- Economic empowerment.
- The shortage of critical skills – development of an attraction and retention strategy; improving skills of the labour force etc.
- Targeting special groups e.g. women, disabled and youth.
- Sustainable job creation.

Opportunities for Growth and Development

An analysis of the economic indicators indicates opportunities for potential growth in the following:-

- Agriculture and agro-processing.
- Manufacturing.
- Tourism.
- Transport and infrastructure.
- Wholesale and retail.
- Mining and value adding – beneficiation.

The analysis is necessary to show what the current infrastructure is available and, where there are opportunities for development and exactly what the needs of the local community are.

When planning for future development, it is not only necessary to know that is needed, but also what resources such as land, buildings and other facilities are available to address these needs.

(17) SENSITIVE LANDSCAPES:

“Sensitive Environments” that have statutory protection are the following:-

1. Limited development areas (Section 23 of the Environmental Conservation Act, 1989 (Act 73 of 1989).
2. Protected natural environments and national heritage sites.
3. National, provincial, municipal and private nature reserves.
4. Conservation areas and sites of conservation significance.
5. National monuments and gardens of remembrance.
6. Archaeological and palaeontological sites.
7. Graves and burial sites.
8. Lake areas, offshore islands and the admiralty reserve.
9. Estuaries, lagoons, wetlands and lakes.
10. Streams and river channels and their banks.
11. Dunes and beaches.
12. Caves and sites of geological significance.
13. Battle and burial sites.
14. Habitat and/or breeding sites of Red Data Book species.
15. Areas or sites of outstanding natural beauty.
16. Areas or sites of special scientific interest.

- 17. Areas or sites of special social, cultural or historical interest.
- 18. Declared national heritage sites.
- 19. Mountain catchment areas.
- 20. Areas with eco-tourism potential.

(b) Description of the current land uses

Please see Baseline Description above.

(c) Description of specific environmental features and infrastructure on the site

Please see Baseline Description above.

**(d) Environmental and current land use map
(Show all environmental, and current land use features)**

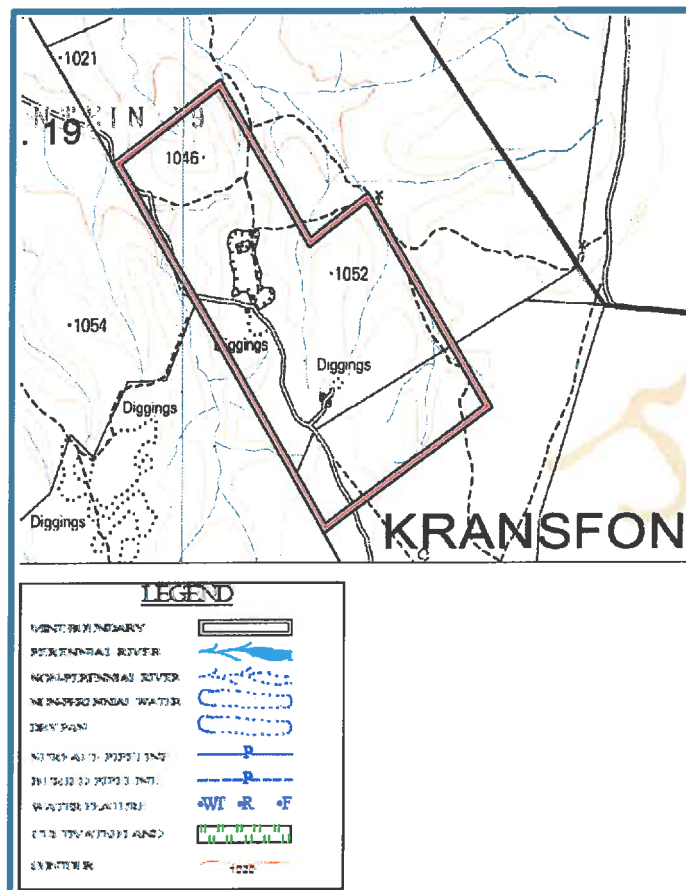


Figure 11: Environmental and current land use features on 1:50 000

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

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

Table 8: Potential impacts identified

Environmental factor	Nature of impact	Significance	Probability	Duration	Consequence	Management
PHYSICAL						
Geology and mineral resource	Sterilisation of mineral resources.	Very low	Highly unlikely	Decommissioning	Insignificant	Ensure that optimal use is made of the available mineral resource.
Topography	Changes to surface topography due to topsoil removal, excavations, blasting, placement of infrastructure and development of mine residue deposits.	Low to medium	Certain	Post-closure	Moderate	Backfill all excavations continuously and employ effective rehabilitation strategies to restore surface topography of excavations and plant site, and to stabilise the mine residue deposit.
Soils	Soil erosion by water and wind on disturbed and exposed soils; potential for dust production and soil microbial degradation; potential contamination of soils due to spillages.	Low	Possible	Life of operation	Minimal	Employ appropriate management strategies to preserve soil resources.
Land capability	Loss of land capability through topsoil removal, disturbances and loss of soil fertility.	Very low	Possible	Short term	Minimal	Employ appropriate rehabilitation strategies to restore land capability.

Land use	Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation	Very low	Possible	Short term	Minimal	Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.
Ground water	Pollution of underground water sources.	Low	Possible	Decommissioning	Minimal	Construction of measures to prevent seepage into the groundwater by biological and engineering means. Implementation of the necessary management programs to ensure the integrity of ground water resources.
Surface water	Deterioration in water quality through spillages.	Low	Certain	Decommissioning	Critical	Frequent monitoring of surface water resources (Standing water). Prevention of overspill of mine associated activities into the surrounding drainage channels streams. Implementation of the necessary management programs to ensure the integrity of surface water (Standing water) resources.
Indigenous flora	The clearance of vegetation; potential loss of floral species with conservation	Low to medium	Certain	Life of operation	Major	Prevention of overspill of mine associated activities onto the surrounding ecological

	value; potential loss of ecosystem function.					environment. Employ proper protection and rehabilitation strategies.
Alien invasive plants	Proliferation of alien invasive plants species.	Low to medium	Certain	Decommissioning	High	Eradicate, and control the spread, of alien invasive species.
Fauna	Displacement of faunal species.	Low	Possible	Life of operation	Minimal	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection strategies.
Habitat	The loss, damage and fragmentation of floral and faunal habitats; potential loss of ecosystem function.	Low to medium	Certain	Residual	Critical	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection and rehabilitation strategies.
Air quality	Sources of atmospheric emission associated with the mining operation are likely to include fugitive dust from materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.	Minimal	Certain	Decommissioning	Minimal	Effective soil management; identification of the required control efficiencies in order to maintain dust generation within acceptable levels.
SOCIAL SURROUNDINGS						
Noise and vibration	Increase in continuous noise levels; the disruption of current ambient noise levels; and the	Low	Certain	Decommissioning	Minimal	Minimise the generation of excessive noise and vibration; Ensure all vehicles and equipment is in

	disruption of sensitive receptors by means of increased noise and vibration.					a good working order; proper communication and management of blasting activities.
Visual impacts	Visual impact of the mine infrastructure, excavations, mine residue deposits, and waste rock stockpile; visibility of dust.	Low	Possible	Decommissioning	Minimal	Effective planning of the location of infrastructure and operations to minimise visual impact.
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Low likelihood	Decommissioning	Minimal	Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.
Heritage resources	The deterioration of sites of cultural and heritage importance.	Low to medium	Certain	Residual	Major	Preservation and protection of heritage and cultural resources identified within a no go zone; further resources uncovered during mining activities need to be reported to a suitably qualified archaeologist.
Socio-economic	Negative: Loss of agricultural potential; influx of workers to the area increases health risks and loitering (resulting in lack of security and safety); negative	Low and Low to medium	Certain	Short-term and Closure	High and Major	Application of commitments made in the Social and Labour Plan; implementation of community development programmes.

	impact of employment loss during mine closure.					
Interested and affected parties	Loss of trust and a good standing relationship between the IAPs and the mining company.	Low to medium	Possible	Decommissioning	High	Ensure continuous and transparent communication with IAPs.

Environment likely to be affected by the alternative land use

Prospecting will not be a new land use over this area. The areas that will be prospected makes up about ±14% of the total area being applied for. The area will not be enlarged as the mining of diamonds is dependent on the occurrence of alluvial gravels availability.

The application is for 253.05 ha of which approximately 35ha was worked. The Remainder is barren in terms of diamonds and comprise steep hills down into valleys. This previously worked area represents 14% of the area affected by prospecting operations. Diamond Dump Recoveries want to re-work, test part of the 35 ha only.



The view from the disturbed areas



The view from the disturbed areas

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

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

The criteria used to assess the significance of the impacts are shown in the table below. The limits were defined in relation to mining characteristics. Those for probability, intensity/severity and significance are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered. These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The significance of the impacts was calculated by using the following formula:

$$(Severity + Spatial Scope + Duration) \times Probability \text{ weighting}$$

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts. These include roads and hauling, excavations, temporary waste dumping, topsoil storage, mine residue deposit dam, plant and processing area, temporary office, workshops and ablution facilities, water tanks, diesel tanks, pipeline, other temporary buildings, etc.

Significance of impacts is defined as follows:

No Impact – There will be no impact on the system or any of its parts.

Very Low – Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

Low – Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

Medium – Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

High – Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these.

Very High – Of the highest order possible within the bounds of impacts which could occur. There would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted.

Weight	Severity	Spatial Scope (Extent)	Duration
6	Disastrous	Trans boundary effects	Residual
5	Catastrophic / major	National / Severe environmental damage	Residual
4	High / Critical / Serious	Regional effect	Decommissioning
3	Medium / slightly harmful	Immediate surroundings / local / outside mine area	Life of operation
2	Minimal / potentially harmful	Slight permanent deviation / on-site	Short term / construction (6 months- 1 yr)
1	Insignificant / non-harmful	Activity specific / No effect/ Controlled	Immediate (0 – 6 months)

Weight Number		1	2	3	4	5
Frequency						
Probability	Frequency of Impact	Highly unlikely	Rare	Low likelihood	Probable/ possible	Certain
		Practically impossible	Conceivable but very unlikely	Only remotely possible	Unusual but possible	Definite
	Frequency of Activity	Annually or less	6 monthly / temporarily	Infrequent	Life of operation	Life of operation

CONSEQUENCE (Severity + Spatial Scope + Duration)															
PROBABILITY (Frequency of activity + frequency of impact)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60

	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Colour Code	Significance Rating	Value	Negative Impact Management Strategy	Positive Impact Management Strategy
	VERY HIGH	126 – 150	Improve current management	Maintain current management
	HIGH	101 – 125	Improve current management	Maintain current management
	MEDIUM – HIGH	76 – 100	Improve current management	Maintain current management
	LOW – MEDIUM	51 – 75	Improve current management	Maintain current management
	LOW	26 – 50	Improve current management	Maintain current management
	VERY LOW	1 – 25	Improve current management	Maintain current management

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

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

Alternatives

1. The option of not proceeding with the proposed prospecting operation

Not proceeding with the proposed prospecting operation will have the following positive and negative consequences:-

Positive

The roads leading to the study area will not be damaged as a result of frequent use by trucks transporting gravels to the plant and diamonds to tender houses.

Negative

- ✚ 4 – 15 Employees of who originate from within the boundaries of the Siyancuma Local Municipality will be left unemployed, thereby contributing to the unemployment rate of this municipal area.
- ✚ 4 – 15 Households will be left without any force of income.

- ✚ A probable increase in the social phenomena normally associated with unemployment, namely crime, alcohol abuse, etc. may occur.
- ✚ An opportunity to uplift and positively impact on the lifestyles of 4 – 15 individuals, through various initiatives will be missed.
- ✚ An opportunity for contributing to cultural cohabitation will be missed.

It is clear from above that the benefits of proceeding with the proposed prospecting operation far outweigh the disadvantages thereof.

2. Alternative mining method

No alternative to the prospecting method used by the applicant was considered as a result of the nature of the resource.

3. Land-use alternatives

Livestock and game farming

As a result of the climate of the area; non-rich soils; the topography of the area and the distance to the nearest surface water, is that the land lends itself to an activity such as livestock farming.

These activities can, however, be successfully practiced in combination with the mining of diamonds, as has been done by the applicant over the past few year (under previous authorisation). This is therefore not an “either-or” situation, the activities which the land lends itself to can be successfully practiced in tandem with the proposed prospecting operation. If practised in an environmentally sustainable way, as the applicant has been meticulously doing in the past, neither of the mentioned activities need to have a detrimental effect on the other.

Utilising the study area and surrounding areas exclusively for livestock farming purposes would have the following positive and negative consequences:-

Positive

The roads leading to the study area will not be damaged as a result of frequent use by truck transporting alluvial gravels to the plant and diamonds to the tender houses.

Negative

- ✚ Downscaling in terms of the number of employees as a result of the fact that livestock and game farming are less labour intensive than diamond mining.
- ✚ An increase in the unemployment rate of the Siyancuma municipal area.
- ✚ Several households will be left without any source of income.

- ✚ A probable increase in social phenomena normally associated with unemployment, namely crime, alcohol abuse, etc. may occur.
- ✚ A positive contributor to the local economy will be removed.

Ecotourism

Utilising the study area and surrounding areas exclusively for ecotourism purposes would have the following anticipated positive and negative consequences:-

Positive:

- ✚ The roads leading to the study area will not be damaged as a result of frequent use by trucks transporting diamonds to the plant and markets; and
- ✚ A positive impact on the local economy through money spent by tourists in local areas.

Negative:

- ✚ Downscaling in terms of the number of employees.
- ✚ An increase in the unemployment rate of the Siyancuma municipal area.
- ✚ Several households will be left without any source of income.
- ✚ A probable increase in the social phenomena normally associated with unemployment, namely crime, alcohol abuse, etc. may occur.
- ✚ An increase in traffic on local gravel roads.
- ✚ A positive contributor to the local economy will be removed.

4. Alternative location

No alternative location for the proposed prospecting operation was considered, as the mining of diamonds is very specific in terms of the location of the alluvial gravels or resource (in terms of the location of diamonds and gravel) specific.

5. Alternatives suggested by interested and/or affected parties

No suggestions for alternatives regarding any of the aspects of the proposed prospecting operation were received from interested and/or affected parties and will therefore be considered in planning of the proposed prospecting operation.

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

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/discussion of the mitigations or site layout alternatives available to accommodate

or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered)

Geology and Mineral Resource

Level of risk: Very low

Mitigation measures

- ❖ Ensure that optimal use is made of the available mineral resource through proper planning.
- ❖ The mine blocks should be delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources.
- ❖ No dumping of materials prior to approval by exploration geologist.

Topography

Level of risk: Low

Mitigation measures

- ❖ Backfill all excavations continuously.
- ❖ Employ effective rehabilitation strategies to restore surface topography of excavations and plant site.
- ❖ Stabilise the mine residue deposits.
- ❖ All temporary infrastructures will be demolished during closure.

Soil Erosion

Level of risk: Very low

Mitigation measures

- ❖ At no point may plant cover be removed within the no-development zones.
- ❖ All attempts must be made to avoid exposure of dispersive soils.
- ❖ Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.
- ❖ Ground exposure should be minimised in terms of the surface area and duration, wherever possible.
- ❖ The mining operation must co-ordinate different activities in order to optimise the utilisation of the excavated trenches and thereby prevent repeated and unnecessary excavations.
- ❖ Construction that required the clearing of large areas of vegetation and excavation should ideally occur during the dry season only.
- ❖ Construction during the rainy season (November to March) should be closely monitored and controlled.
- ❖ The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers.

- ❖ The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion.
- ❖ All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses.
- ❖ Excavated and stockpiled soil material are to be stored and bermed on the higher laying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- ❖ Stockpiles susceptible to wind erosion are to be covered during windy periods.
- ❖ Audits must be carried out at regular intervals to identify areas where erosion is occurring.
- ❖ Appropriate remedial action, including the rehabilitation of the eroded areas, must occur.
- ❖ Rehabilitation of the erosion channels and gullies.
- ❖ The mining operation should land with steep slopes.
- ❖ Dust suppression must take place, without compromising the sensitive water balance of the area.
- ❖ Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.

Soil Pollution

Level of risk: Very low

Mitigation measures

- ❖ Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- ❖ Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available in close proximity on site.
- ❖ Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- ❖ All facilities where hazardous materials are stored must be contained in a bund wall.
- ❖ Vehicles and machinery should be regularly serviced and maintained.

Land Capability and Land Use

Level of risk: very low

Mitigation measures

- ❖ Ensure that optimal use is made of the available land through consultation with land owner and proper planning of mining activities.
- ❖ Surface agreement to be signed with land owners.

- ❖ Employ effective rehabilitation strategies to restore land capability and land use potential of the farm.
- ❖ All activities to be restricted within the demarcated areas.
- ❖ Ensure that land which is not used during construction is made available for grazing.

Groundwater

Level of risk: Very low

Mitigation measures

- ❖ Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- ❖ Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available in close proximity on site.
- ❖ Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- ❖ All facilities where hazardous materials are stored must be contained in a bund wall.
- ❖ Vehicles and machinery should be regularly serviced and maintained.
- ❖ Sample according to the sampling method and parameters for analysis is indicated in the Geohydrological study.

Surface Water

Level of risk: Very low

Mitigation measures

- ❖ Sufficient care must be taken when handling hazardous materials to prevent pollution.
- ❖ Under no circumstances may ablutions occur outside the provided facilities.
- ❖ If servicing and washing of the vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages.
- ❖ A walled concrete platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicide and insecticides.
- ❖ Oil residue shall be treated with oil absorbent and this material removed to an approved waste site. Sludge and silt traps to be cleaned at least weekly in order to prevent any overflow of contaminated water.
- ❖ Spill kits must be easily accessible and workers must undergo induction regarding the use thereof.
- ❖ At all times care should be taken not to contaminate surface water resources.
- ❖ Store all litter carefully to prevent it from washing away or blown into any of the water courses within the area.

- ❖ Provide bins for staff at appropriate locations, particularly where food is consumed.
- ❖ The mining site should be cleared daily and litter removed.
- ❖ Conduct ongoing staff awareness programmes in order to reinforce the need to avoid littering, which contributes to surface water pollution.

Indigenous Flora

Level of risk: Low to medium

Mitigation measures

- ❖ Minimise the footprint of transformation.
- ❖ Encourage proper rehabilitation of mined areas.
- ❖ Encourage the growth of natural plant species.
- ❖ Ensure measures for the adherence to the speed limit.
- ❖ Footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining.
- ❖ It is recommended that these plants are identified and marked prior to mining.
- ❖ These plants should, where possible, be incorporated into the design layout and left in situ.
- ❖ However, if threatened of destruction by mining, these plants should be removed (with the relevant permits from DAFF and DENC) and relocated if possible.
- ❖ A management plan should be implemented to ensure proper establishment of ex situ individuals, and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation.
- ❖ All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.

All Invasive Plants

Level of risk: Very low

Mitigation measures

- ❖ Minimise the footprint of transformation.
- ❖ Encourage proper rehabilitation of mined areas.
- ❖ Encourage the growth of natural plant species.
- ❖ Mechanical methods (hand-pulling) of control to be implemented extensively.
- ❖ Annual follow-up operations to be implemented.

Fauna

Level of risk: Very low

Mitigation measures

- ❖ Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of pristine habitats and minimise the overall mining footprint.
- ❖ The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance.
- ❖ The extent of the mine should be demarcated on site layout plans, and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors.
- ❖ All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.
- ❖ The ECO must ensure that all contractors and workers undergo Environmental induction prior to commencing with work on site.
- ❖ The environmental induction should occur in the appropriate languages for the workers who may require translation.
- ❖ Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- ❖ Employ measures that ensure adherence to the speed limit.

Habitat

Level of risk: Low

Mitigation measures

- ❖ Mining activities must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- ❖ The extent of the mining area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). No construction personnel or vehicles may leave the demarcated area except those authorised to do so.

Air Quality

Level of risk: Very low

Mitigation measures

- ❖ Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for mining only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.
- ❖ Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression.

- ❖ Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads.
- ❖ The length of time where open areas are exposed should be restricted. Mining should not be delayed after vegetation has been cleared and topsoil removed.
- ❖ Dust suppression methods should, where logistically possible, be implemented at all areas that may/are exposed for long periods of time.
- ❖ Blasting and drilling (if required) should be delayed under unfavourable wind and atmospheric conditions.
- ❖ For all mining activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.

Noise and Vibration

Level of risk: Very low

Mitigation measures

- ❖ Restrict mining activities to daytime unless agreements obtained to do 24hr operations.
- ❖ Systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events.
- ❖ Where possible material stockpiles should be placed so as to protect the boundaries from noise to individual operations.
- ❖ Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases which could lead to increase in the noise impact over time and increased complaints.
- ❖ Environmental noise monitoring should be carried out at regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted.

Visual Impacts

Level of risk: Very low

Mitigation measures

- ❖ Infrastructure should be placed to optimise the natural screening capacity of the vegetation.
- ❖ Where practical, protect existing vegetation clumps in order to facilitate screening during the mining operation.

- ❖ Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the mining site free from additional unsightly elements.
- ❖ Locate the staff camps and the material stockpiles outside of the visual field of sensitive visual receptors.
- ❖ Dust suppression procedures should be implemented especially on windy days during earth works.
- ❖ Rehabilitation should aim to establish a diverse and self-sustaining surface cover that is visually and ecologically representative of naturally occurring vegetation species.
- ❖ Implement a management plan for the post-mining site in order to control the invasion of alien vegetation and to manage erosion, until the site is fully rehabilitated.

Traffic and Road Safety

Level of risk: Very low

Mitigation measures

- ❖ Implement measures that ensure the adherence to traffic rules.
- ❖ Implement and maintain speed control/ limits in order to ensure safety and flow of traffic.

Heritage Resources

Level of risk: Very low

Mitigation measures

- ❖ The heritage and cultural resources (e.g. graveyards, ruins, historic structures, etc.) must be protected and preserved by the delination of a no go zone.
- ❖ Intact bedrock strata should be avoided during mining of terrace gravels where possible.
- ❖ Stone tools should be avoided where possible and fresh exposure should be recorded before destruction. All stone tool artefacts should be recorded, mapped and collected before destruction.
- ❖ Should development necessitate impact on any building structures, the developer should apply for a SAHRA Site Destruction Permit prior to commencement of construction.

Socio-Economic

Level of risk: Very low

Mitigation measures

- ❖ The mine must ensure that false expectations are not created regarding job creation.

- ❖ Jobs must be allocated as advertised and in so far as is possible to local inhabitants.
- ❖ Contractors and employees should not be permitted to wander outside the mining area.
- ❖ Uncontrolled settlement of contractors and workers outside of the site will be prevented.
- ❖ The expectations of what benefits can accrue to the community must be managed from the initiation of the project.
- ❖ Commitments as set out in the SLP must be attained.

Interested and Affected Parties

Level of risk: Very low

Mitigation measures

- ❖ Maintain active communications with IAPs.
- ❖ Ensure transparent communication with IAPs at all times.
- ❖ IAPs must be kept up to date on any changes in the mining operation.
- ❖ A complaints management system should be maintained by the mine to ensure that all issues raised by community members are followed up and addressed appropriately.

ix) Motivation where no alternative sites were considered

No alternative location for the proposed prospecting operation was considered, as the mining of diamonds is very specific in terms of the location of the alluvial diamond gravels or resource specific. There is therefore no alternative with regard to the overall operation footprint.

The location of the prospecting pits and associated infrastructure is primarily based on occurrence of alluvial diamonds.

The mining activities and methodologies associated with alluvial diamond prospecting is the only economic viable method currently being used by the diamond fraternity. There is no alternative method for prospecting diamonds.

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

Not applicable. There is no alternative development location for the site.

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

Not applicable. There is no alternative development location for the site and therefore the initial site locality is considered to be the final site locality. The impact assessment provided in section g(v) is therefore sufficient and the process undertaken to identify impacts is the same as in section g(vi).

i) Assessment of each identified potentially significant impact and risk

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

Table 9: Assessment of significant impact and risk

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	SIGNIFICANCE If not mitigated	MITIGATION TYPE	SIGNIFICANCE If mitigate
Roads	Air quality	Nuisance dust will be created by the mining equipment hauling material between the open excavation areas and the plant area.	Construction	High	Dust control Water spraying. Well maintained equipment	Medium
	Fauna	NO new roads will be established. Sufficient existing roads exist.	Construction	High	Speed limits Environmental Awareness	High
	Flora	NO new roads will be established. Sufficient existing roads exist.	Construction	High	Stripping of topsoil and concurrent rehabilitation	High
	Ground water	No impact to groundwater is expected from the roads that will be used by the planned mining operation.	Construction	No significance	Pollution control and good housekeeping practice	No significance

	Noise	Noise from the mining equipment on the haulage roads will be created.	Construction	Medium	Noise control Well maintained equipment	Low
	Soil	No impact to soil is expected from the roads that will be used by the planned mining operation.	Construction	No Significance	Stripping of topsoil and concurrent rehabilitation	No Significance
	Surface water	No impact to surface water is expected from the roads that will be used by the planned mining operation.	Construction	No significance	Pollution control and on-going housekeeping	No Significance
	Topography	No impact to topography is expected from the roads that will be used by the planned mining operation.	Construction	No Significance	Concurrent rehabilitation	No Significance
	Visual	The haulage roads will be visible to some extent from the immediate surroundings.	Construction	No Significance	Concurrent Rehabilitation	No Significance
	Air quality	Nuisance dust will be created by mining equipment excavating material from the mining pits.	Operational	High	Dust control Well maintained equipment	Medium
Pitting/excavating	Fauna	Where new pits/ excavations will be created the natural habitat of the animals will be disturbed and/or destroyed.	Operational	High	Speed limits Environmental Awareness	High

	Flora	Where new pits/ excavations will be created the vegetation will be disturbed and/or destroyed.	Operational	High	Stripping of topsoil and concurrent rehabilitation	High
	Ground water	No impact to groundwater is expected from the creation of excavations.	Operational	No Significance	Pollution control and good housekeeping practice	No Significance
	Noise	Noise impact from the mining equipment will be created.	Operational	High	Noise control Well maintained equipment	Medium
	Soil	The disturbance of the soil structure during excavation activities.	Operational	High	Stripping of topsoil and concurrent rehabilitation	High
	Surface water	No impact to surface water is expected during excavation activities.	Operational	No Significance	Pollution control and on-going housekeeping	No Significance
	Topography	Changing of natural slopes by mining pitting activities.	Operational	Medium	Concurrent rehabilitation	Low
	Visual	The excavations will be visible to some extent from the immediate surroundings.	Operational	No Significance	Concurrent Rehabilitation	No Significance
Temporary waste dump area & topsoil storage area	Air quality	Nuisance dust will be created by the mining equipment when the material is dumped/ stockpiled in these areas.	Commissioning	High	Dust control Well maintained equipment	Medium
	Fauna	The natural habitat of the animals will be disturbed and/or	Commissioning	High	Speed limits Environmental Awareness	High

		destroyed in these areas.				
	Flora	The vegetation will be disturbed and/or destroyed in these areas.	Commissioning	High	Stripping of topsoil and concurrent rehabilitation	High
	Ground water	No impact to groundwater is expected.	Commissioning	No Significance	Pollution control and good housekeeping practice	No Significance
	Noise	Noise impact from the prospecting equipment will be created.	Commissioning	High	Noise control Well maintained equipment	Medium
	Soil	The disturbance of the soil structure.	Commissioning	High	Stripping of topsoil and concurrent rehabilitation	High
	Surface water	No impact to surface water is expected.	Commissioning	No Significance	Pollution control and on-going housekeeping	No Significance
	Topography	Changing of natural slopes.	Commissioning	Medium	Concurrent rehabilitation	Low
	Visual	These temporary storage areas will be visible to the immediate surroundings.	Commissioning	No Significance	Concurrent Rehabilitation	No Significance
Mine residue disposal dam	Air quality	No impact to air quality is expected.	Commissioning	No Significance	Dust control Well maintained equipment	No Significance
	Fauna	The natural habitat of the animals will be disturbed and/or destroyed when the mine residue dam is created.	Commissioning	High	Speed limits Environmental Awareness	High
	Flora	The vegetation will be disturbed and/or destroyed when the mine residue dam is created.	Commissioning	High	Stripping of topsoil and concurrent rehabilitation	High

	Ground water	No impact to groundwater is expected.	Commissioning	No Significance	Pollution control and good housekeeping practice	No significance
	Noise	No noise impact is expected.	Commissioning	No Significance	Noise control Well maintained equipment	No significance
	Soil	The disturbance of the soil structure when the mine residue dam is created	Commissioning	High	Stripping of topsoil and concurrent rehabilitation	High
	Surface water	No impact to surface water is expected.	Commissioning	No Significance	Pollution control and on-going housekeeping	No Significance
	Topography	Changing of natural slopes.	Commissioning	Medium	Concurrent rehabilitation	Low
	Visual	The mine residue dam will be visible to the immediate surroundings.	Commissioning	No Significance	Concurrent Rehabilitation	No Significance
	Plant & processing area	Air quality	Nuisance dust will be created by the mining equipment.	Operational	High	Dust control Well maintained equipment
Fauna		Where the plant and processing area will be created the natural habitat of the animals will be disturbed and/or destroyed.	Operational	High	Speed limits Environmental Awareness	High
Flora		Where the plant and processing area will be created the vegetation will be disturbed and/or destroyed.	Operational	High	Stripping of topsoil and concurrent rehabilitation	High
Ground water		No impact to groundwater is expected.	Operational	No Significance	Pollution control and good housekeeping practice	No Significance
Noise		Noise from the	Operational	High	Noise control	Medium

		plant and processing equipment will be created.			Well maintained equipment	
	Soil	The disturbance of the soil structure when the plant and processing area is created.	Operational	High	Stripping of topsoil and concurrent rehabilitation	High
	Surface water	Water from the Vaal river will be used for the washing of diamond material.	Operational	High	Pollution control and on-going housekeeping	Medium
	Topography	No impact to the topography is expected from the plant and processing area.	Operational	No Significance	Concurrent rehabilitation	No Significance
	Visual	The plant and processing area will be visible to some extent from the immediate surroundings.	Operational	No Significance	Concurrent Rehabilitation	No Significance

j) Summary of specialist reports

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

Table 10: Summary of specialist reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
A heritage assessment report has already been done.	A heritage study was done in 2005 when the first mining activities took place on the same property and area. The artefacts seen during the survey were all from dug-over un-stratified contexts and have therefore no heritage value (please see report from Peter B Beaumont attached). Should any other heritage features and/or objects be located or observed, a	X	i) Details of the development footprint alternatives considered Environmental attributes with development footprints (Cultural and Heritage Resources)

	<p>heritage specialist will be contacted immediately. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that a heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This is true for graves and cemeteries as well. If the prospecting approved, the heritage resources if any other had been encountered will be protected through the demarcation of no-go zones and fencing off.</p>		
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k) Environmental impact statement

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

The nature of impacts can vary widely depending on the type of physical environment, the size of the activity and the perceptions and values of each of the affected parties. It was the objective of the assessment to identify both positive and negative impacts. The existing information was reviewed to assess the present status of the environment and the extent to which they have already been modified. The planned activities and associated infrastructure was used as reference to assess potential impacts.

In general, the environmental impacts associated to the mining operation are rather negative, while the social impacts are more beneficial. Impacts on vegetation are likely to be most profound, because the mining operation will constitute large-scale clearance of indigenous vegetation and most likely also the removal of protected species. The paleontological resources confined to the gravel terraces are also likely to be destroyed. Soil erosion and surface water deterioration are likely to be possible important impacts if appropriate management strategies are not practised.

Positive impacts include the demarcation and subsequent protection of heritage resources and the eradication of alien invasive species. Positive social impacts include the creation of jobs, social upliftment, training opportunities, community development and numerous economic benefits.

To conclude, it must be accepted that any activities will have both physical and social impacts. Therefore the destruction of the natural environmental features within the mining area is inevitable. The significance of the impacts will however be affected by the success of the mitigation measures implemented and the rehabilitation programme for the mining area.

(ii) **Final Site Map;**

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



Figure 12: Final Site Map

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

Land Use or Development Alternatives

Prospecting for alluvial diamond gravels have taken place in the area. When alluvial prospecting is stopped in the area and once rehabilitated the land use can revert back to livestock farming.

Alternative Mining Methods

The mining method of prospecting pits with continued backfilling is the only economic viable method currently being used by the alluvial diamond fraternity. No alternative mining method can be considered at this stage.

Consequence if not proceeding with the Operations

The provision will make provision for 4 – 15 job opportunities. This will be lost if the project does not proceed. Substantial tax benefits to the State and Local Government will also be lost.

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

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

The impact management objective for the Diamond Dump Recovery prospecting operation should include:-

- To ensure efficient extraction of the diamond resource.
- To limit the alteration of the surrounding topography.
- To manage and preserved sensitive soil types.
- To prevent the loss of land capability.
- To ensure the continuation of economically viable land use.
- To ensure that the surrounding ground water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quality of ground water resources.
- To ensure that the surrounding surface water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quantity and quality of surface water resources.
- To contain soils and materials within demarcated areas and prevent contamination of storm water runoff.
- To minimise the loss of natural vegetation.

- To prevent the proliferation of alien invasive plants species.
- To protect the wildlife and bird species.
- To protect the natural habitat of wildlife and bird species.
- To maintain visual integrity; and to minimise the extent of the generation of dust in order to minimise the aspect of nuisance and health impacts to sensitive receptors.
- To minimise noise and vibration to a level that disturbances felt by the communities are limited.
- To reduce the impact on visual quality due to intrusive mine infrastructure, activities and facilities.
- To ensure that all traffic generated by the mining development does not negatively impact on existing road networks and infrastructure; and to ensure traffic safety.
- To preserve the historical and cultural artefacts located on site in compliance with the South African Heritage Resources Act, 1999 (Act No. 25 of 1999).
- To ensure that the current socio-economic status quo is improved.
- To be transparent and practise effective communication; in order to maintain good relationships with all interested and affected parties.

m) Final proposed alternatives

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

The locality of the mining operation is based on the location of the diamondiferous deposits that have been identified through extensive exploration activities. There is therefore no other alternative with regard to the overall operation footprint.

The location of the central mining site and associated infrastructure is primarily based on proximity to the access roads, proximity to the areas earmarked for mining and limited additional impact on the environment and heritage resource. The property was already under a prospecting right with bulk sampling and all the infrastructure had already been constructed during this operation. It will therefore cause additional impacts if this infrastructure is moved and render the consideration of alternative mining site useless.

The mining activities and methodologies associated with kimberlite diamond mining is the only economic viable method currently being used by the diamond fraternity. There is no alternative mining method for the mining of kimberlite diamonds.

n) Aspects for inclusion as conditions of Authorisation

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

There are no aspects which have not formed part of the EMPR that must be made conditions of the Environmental Impact Assessment Report.

o) Description of any assumptions, uncertainties and gaps in knowledge
(Which relate to the assessment and mitigation measure proposed)

This report was compiled by incorporating information provided by the applicant and the various specialists and no warranty or guarantee, whether expressed or implied, is made by the EAP with respect to the completeness, accuracy or truth or any aspect of this document with reference to the instructions, information and data supplied by the aforementioned parties.

The impact assessment was conducted based on the EAPs knowledge and experience. The probability, intensity/severity and significance pertaining to the criteria used to assess the significance of the impacts were based on rule-of-thumb and experience.

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

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

There are no significant reasons why the activity should not be authorized. However, if the proposed management and mitigation measures are not properly applied or if the mining operation intentionally disregards any of these measures, it will negatively affect the environment and have more long-term consequences. Therefore, the competent authority should take all the necessary steps to ensure that the mining operation complies with the conditions set out in the approval of the EMPR.

ii) Conditions that must be included in the authorisation.

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

Apart from ensuring that the necessary permits are obtained for restricted activities, all recommendations and mitigation measures as set out in the EMPR should be adhered to.

(2) Rehabilitation requirements

Infrastructure Areas

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

- All remaining material on the surface should be removed to the original topsoil level. This material should then be backfilled into the depressions. Any compacted area should be ripped to a depth of 300mm, where possible, the topsoil or growth medium returned and landscaped.
- All infrastructures, equipment, screening plant, and other items used during the operation period should be removed from the site.
- On completion of operations, all buildings, structures or objects on the office site should be dealt with in accordance with Regulation 44 of the Mineral and Petroleum Resources Development Act, 2002.

Topsoil and Stockpile Deposits

Disposal Facilities: Waste material of all description inclusive of receptacles, scrap, rubble and tyres should be removed entirely from the mining area and disposed of at a recognized landfill facility. It should not be permitted to be buried or burned on the site.

Ongoing Seepage, Control of Rain Water: It is not foreseen that any monitoring of ground or surface water should take place after mine closure, except if so requested by the DWS – Northern Cape.

Long Term Stability and Safety: It should be the objective of mine management to ensure the long term stability of all rehabilitated areas including the backfilled depressions. This should be done by the monitoring of all areas until a closure certificate has been issued.

Final rehabilitation in respect of erosion and dust control: Self-sustaining vegetation will result in the control of erosion and dust and no further rehabilitation is deemed necessary, unless vegetation growth is not returned to a desirable state by the time of mine closure.

Final Rehabilitation Roads

- After rehabilitation has been completed, all roads should be ripped or ploughed, fertilized and seeded, providing the landowner does not want them to remain that way and with written approval from the Director: Mineral Development of the Department of Mineral Resources.

Submission of Information

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

Maintenance (Aftercare)

- Maintenance after closure should include the regular inspection and monitoring and/or completion of the re-vegetation programme.
- The aim of the Environmental Management Programme is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.
- The aim with the closure of the mine should be to create an acceptable post-mine environment and land-use. Therefore all agreed commitments should be implemented by Mine Management.

After-effects Following Closure

Acid Mine Drainage: No potential for bad quality leachate or acid mine drainage development is associated with kimberlitic diamond mine closure.

Long Term Impact on Ground Water: No after effect on the groundwater yield or quality is expected.

Long-term Stability of Rehabilitated Land: One of the main aims of any rehabilitated ground should be to obtain a self-sustaining and stable end result. The concurrent cleaning of all tailings material and replacement of topsoil where available should be ensured.

q) Period for which the Environmental Authorisation is required

Environmental Authorisation is required for 5 years.

r) Undertaking

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basis Assessment Report and the Environmental Management Programme Report.

The undertaking required to meet the requirements of this sections is provided at the end of the EMPR and is applicable to both the Environmental Impact Assessment Report and the Environmental Management Report.

s) Financial Provision

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

The bank guarantee to be submitted to the DMR for mine closure and rehabilitation is to the value of R301303 (Three thousand and one and three hundred and three rand).

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	198	12.21	1	1	2 417.58
2 (A)	Demolition of steel buildings and structures	m2	215	170.13	1	1	36 577.95
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	250.72	1	1	-
3	Rehabilitation of access roads	m2	2500	30.44	1	1	76 100.00
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	295.49	1	1	-
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	161.18	1	1	-
5	Demolition of housing and/or administration facilities	m2	0	340.26	1	1	-
6	Opencast rehabilitation including final voids and ramps	ha	0.188	173174.97	0.52	1	16 884.56
	50 pits 25m X 15 m only 5 open at any time		0.188	173174.97	0.52	1	16 884.56
				173174.97	0.52	1	-
				173174.97	0.52	1	-
				173174.97	0.52	1	-
				173174.97	0.52	1	-
				173174.97	0.52	1	-
				173174.97	0.52	1	-
				173174.97	0.52	1	-
7	Sealing of shafts adits and inclines	m3	0	91.33	1	1	-
8 (A)	Rehabilitation of overburden and spoils	ha	0.3	118912.29	1	1	35 673.69
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0.3	148103.1	1	1	44 430.93
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	430161.62	1	1	-
9	Rehabilitation of subsided areas	ha	0	99571.13	1	1	-
10	General surface rehabilitation	ha	0.3	40000	1	1	12 000.00
11	River diversions	ha	0	94198.59	1	1	-
12	Fencing	m	0	107.45	1	1	-
13	Water management	ha	0	35816.95	1	1	-
14	2 to 3 years of maintenance and aftercare	ha	0.3	12535.93	1	1	3 760.78
15 (A)	Specialist study	Sum	0			1	-
15 (B)	Specialist study	Sum				1	-
Sub Total 1							227 845.49
1	Preliminary and General		13 670.73		weighting factor 2		13670.72913
					1		
2	Contingencies			22784.54856			22784.54856
Subtotal 2							264300.76
VAT (14%)							37002.11
Grand Total							301303

i) Explain how the aforesaid amount was derived

The quantum of the financial provision contemplated in Regulation 54 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) will be revised and adjusted accordingly annually, based on a survey assessment of the environmental liability of Diamond Dump Recovery CC. Surveys of excavations are conducted by a registered surveyor and results are forwarded to the Environmental Manager who calculates the outstanding rehabilitation as per the agreed rate in the DMR Guideline. A bank guarantee is prepared for the amount and submitted to the DMR.

Financial provision for the rehabilitation or management of negative environmental impacts caused by the mining operation [as required by Section 41 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] will be made in the

form of a financial guarantee from a South African registered bank. This document will guarantee the financial provision relating to the Environmental Management Programme in a format as approved by the Director-General.

- ii) Confirm that this amount can be provided from operating expenditure**
(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining Work Programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be)

Diamond Dump Recoveries does not require any loan mechanism or scheme to undertake prospecting operations.

Diamond Dump Recoveries is funding their own operation phase, see audited financial statements of the company appended hereto.

t) Deviations from the approved scoping report and plan of study

- i) Deviations from the methodology used in determining the significance of potential environmental impacts and risks**
(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation)

The Scoping Report have not been approved yet. No activities listed in the Scoping Report have been changed in the EIA EMP.

ii) Motivation for the deviation

Not applicable.

u) Other information required by the competent Authority

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

(1) Impact on the socio-economic conditions of any directly affected person

The alluvial diamond prospecting operation has gained the permission from the surface owners of the farm. Rockwell Diamonds and Jasper Mine has given comments and concerns. Interested and affected party consultation is an ongoing process and all comments and concerns that is received will be incorporated and attended to with proof thereof.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act

A heritage study was done in 2005 when the first mining activities took place on the same property and area. The artefacts seen during the survey were all from dug-over un-stratified contexts and have therefore no heritage value (please see report from Peter B Beaumont attached).

Should any other heritage features and/or objects be located or observed, a heritage specialist will be contacted immediately. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that a heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This is true for graves and cemeteries as well. If the prospecting operation is approved, the heritage resources if any other had been encountered will be protected through the demarcation of no-go zones and fencing off.

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

There are no alternatives, as the application area applied for is the area where the natural alluvial gravels occur and where the diamonds would be encountered.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme

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

I hereby confirm that the requirement for the provision of the details and expertise of the EAP is already included in Part A, section 1(a) as required.

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

I hereby confirm that the requirements to describe the aspects of the activity that are covered by the draft environmental management programme are already including in PART A, section 1(h).

Confirmed	X
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- c) **Composite Map**

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

The final site map below indicates the prospecting right application area in which all prospecting will take place. Existing roads are also depicted. NO new roads will be established. Sufficient existing roads exist. The associated infrastructure relating to the prospecting site will be placed in the area marked as the “mine infrastructure footprint”.

The only buffers that must be implemented is the 100 m away from any fixed infrastructure like the tar road and out buildings in terms of the Mine Health and

Safety Act, 1996 (Act No. 29 of 1996) Regulations relating to surveying, mapping and mine plans.

These regulations states that a mine must take reasonable measures to ensure that:

No mining operations are carried out within a horizontal distance of 100 (one hundred) metres from reserve land, buildings, roads, railways, dams, waste dumps, or any other structure whatsoever including such structures beyond the mining boundaries, or any surface, which it may be necessary to protect in order to prevent any significant risk, unless a lesser distance has been determined safe by risk assessment and all restrictions and conditions determined in terms of the risk assessment are complied with.



Figure 13: Composite Map

d) Description of impact management objectives including management statements

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

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas should be left in a stable, self-

sustainable state. Proof of this should be submitted at closure. Specific objectives include:

Rehabilitation of infrastructure areas

The objective for the removal of infrastructure and the subsequent rehabilitation of the areas they occupied include:

- To ensure that infrastructure identified for removal is successfully demolished and removed.
- To ensure that infrastructure identified to remain after mine closure is maintained until the issue of a closure certificate.

The removal, decommissioning and disposal of all mining infrastructure, will comply with all conditions contained in the MRPDA. To this end, decommissioning and rehabilitation of all infrastructure areas will follow the following principles:-

- The plant and associated disused infrastructure will be dismantled or demolished. Any building foundations will be removed and land exposed to the demolition and dismantling of infrastructure and all other disturbed land will be rehabilitated
- Rubble will be disposed of at a suitable site. The site will be selected in consultation with DENC.
- Any surface water management infrastructure will be maintained to ensure they are stable and functional.
- Just before closure, when disturbed land has been rehabilitated and erosion is controlled by vegetation cover, all disused surface water management facilities will be decommissioned.

Mine residue deposits

The mine residue deposits comprise of a slimes dam. The objectives pertaining to the effective management and rehabilitation of the slimes dam include:

- To ensure that the mine residue deposits are stable and that there is an acceptably low risk of failure of these deposits during the decommissioning phase and following mine closure.
- To establish self-sustainable vegetation cover on the slimes dam so that the visual impact of the slimes dam is improves and in order to prevent erosion.

Management principle pertaining to the slimes dam includes:

- The slimes dam/s will continuously be inspected by a suitable qualified professional engineer to ensure their stability. If they are unstable, the appropriate remedial measures will be implemented.

- Inspection and monitoring should continue until a suitable qualified profession engineer has confirmed the long-term stability of the slimes dam.
- Any infrastructure or facilities that serve the slimes dam will be maintained to ensure that they are both stable and functional.

Maintenance

The necessary agreements and arrangement will be made by Diamond Dump Recoveries CC to ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state or for three (3) years after closure or as long as deemed necessary at the time.

- Such processes include erosion of the slimes dams, rehabilitated surfaces, surface water drainage, air quality, surface water quality, ground water quality, vegetative re-growth, weed encroachment.
- The closure plan will be reviewed yearly.
- Rehabilitation of the land will be maintained until a closure certificate is granted or until the land use is regarded as sustainable.
- All rehabilitated areas will be monitored and maintained until such time as required to enable the mine to apply for closure of these different areas.

Audit Reports / Performance assessments

As per the MPRDA and associated Regulations, this Environmental Management Programme will be continually assessed in terms of its appropriateness and adequacy. In order to achieve this, Diamond Dump Recoveries CC will undertake the following:

- Implement the necessary monitoring programmes, as discussed as part of this EMPR;
- Conduct performance assessments of this EMPR as required by the MPRDA and associated Regulations; and
- Compile and submit the afore-mentioned performance assessment reports to the DMR. The frequency of the performance assessments will occur every year. An independent and competent person will undertake all performance assessments.

Decommissioning and closure objectives

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas will left in a stable, self-sustainable state. Proof of this will be submitted at closure. Specific objectives include:

- To identify potential post-closure land uses in consultation with the surrounding land owners and land users. This should be done during the operational phase of the mine.
- Rehabilitate disturbed land to a state suitable for its post-closure uses.
- Rehabilitate disturbed land and mine residue deposits to a state that facilitates compliance with applicable environmental quality objectives.
- Limit the impact on staff whose positions become redundant at the time of mine closure.
- Keep relevant authorities informed of the progress of the decommissioning phase.
- Submit monitoring data to the relevant authorities.
- Maintain required pollution control facilities and rehabilitated land until closure.

Negative economic impacts

The objective is to alleviate the negative socio-economic impacts that will result from mine closure. Management principles to achieve this include:

- Diamond Dump Recoveries will undertake a carefully planned step-wise decommissioning process.
- Closure planning will form an integral part of mine planning.
- Strategies for sustainable development of surrounding towns have been and will continue to be developed by the project in collaboration with district and local authorities, local businesses and other interested parties. Early warning of impending closure will be given to IAPs.
- In conjunction with long-term closure planning, the mine will actively participate in regional and local planning to enhance the economic benefits of the project through development of alternative forms of income generation.
- Diamond Dump Recoveries will initiate and participate in regional planning exercises that will mitigate the impacts of closure of the mine, the local and regional economies and associated abandonment of community infrastructures surrounding the mine.
- The mine will fulfil the requirements for closure and the management of downscaling.

ii) **The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity**

These are contained in the EMPR.

- iii) **Potential risk of Acid Mine Drainage** (Indicate whether or not the mining can result in acid mine drainage)

No potential risk for Acid Mine Drainage exist.

- iv) **Steps taken to investigate, assess, and evaluate the impact of acid mine drainage**

N/A

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

N/A

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

N/A

- vii) **Volumes and rate of water use required for the mining, trenching or bulk sampling operation**

The operation would require about 100 000 litres per day if a washing and crushing plant is going to be used.

- viii) **Has a water use licence been applied for?**

Yes in the process of applying for a Water Licence.

- ix) **Impact to be mitigated in their respective phases**

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

Table 11: Impact to be mitigated in their respective phases

Activity and Phase	Potential Impact	Size and Scale	Mitigation or control measure related to compliance with standards
ENVIRONMENTAL IMPACTS			
Construction Activities	Geology Sterilisation of mineral resources	Local	- No dumping of materials prior to approval by manager; - Proper planning of pits /excavations.
Control measures are to be applied during the implementation of respective activities	Topography Changes to surface topography due to placement of infrastructure and development of residue deposits	Local	- Prominent natural features will not be disturbed such as drainage lines; - All temporary infrastructure will be demolished during closure; - Waste will be disposed of at Municipal waste disposal site; - All disturbed areas will be rehabilitated.
	Soils Loss of soils resources due	Local	- All temporary infrastructures will be demolished during closure;

	<p>to erosion</p> <p>Soil contamination due to hydrocarbon spillages</p>	<ul style="list-style-type: none"> - Waste will be disposed of at a Municipal waste disposal site; - Agreement to use this site will be sought from the municipality; - All disturbed areas will be cleaned and rehabilitated; - Topsoil will be stripped according to the soil type and the available soil depth in the areas to be disturbed (up to 150mm) as per soil analysis of the area; - Soil will be stockpiled in windrows not higher than 2m with as little compaction as possible; - Stockpiling will be done as close as possible to areas where the soils will be replaced and single handling practised; - Soil stockpiles will be kept in a weed-free condition; - Stockpiled soil will be used in ongoing rehabilitation of disturbed areas; - Rehabilitation will include:- <ul style="list-style-type: none"> ✓ removing of all debris, ✓ replacement of soil with as little compaction as possible, ✓ reshaping, ploughing or ripping to break compaction; and ✓ introduction of organic matter as necessary. - Soil contamination will be prevented through:- <ul style="list-style-type: none"> ✓ bunding of all above-ground storage facilities, ✓ construction on impervious floors for hazardous substances such as diesel, oil and chemicals; and ✓ regular inspections of equipment and vehicles for leaks - Spillages of oil, grease and hydraulic fuels will be reported. The spillages will be cleaned up by removing the soil and disposing such soil in a waste receptacle called soil farm. A dedicated engineer will be appointed to oversee the soil farm. - Contaminated soil will be removed taken to this soil farm, where it will be treated with decontaminant. The treated soil samples will be taken to the laboratory to determine if this soil is suitable for taking back to rehabilitation areas. - Contractors, staff and drivers will be trained on how to deal with spillage of hydrocarbons and other potential contaminants. - All domestic and industrial waste generated on site will be contained in skips and appropriate receptacles, collected and if required sorted by the approved contractor, and removed to approved waste disposal site. - Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion. - All surface water management infrastructure constructed from soil (berms, canals and bunds) will be inspected at least monthly, with more frequent inspections during periods of high rainfall and after major rainfall events. - The disturbed areas will be rehabilitated to grazing potential and appropriate erosion control measures will be implemented. After the overburden have been placed back in the mined
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			<p>open pits, the topsoil/subsoil dumps will be replaced for rehabilitation and re-vegetation purposes.</p> <ul style="list-style-type: none"> - Any excavation of topsoils will be done such that the cleared area is also ripped and allow to re-vegetate.
	<p>Land capability Loss of land capability</p>	Local	<ul style="list-style-type: none"> - All construction activities to be restricted within the demarcated areas. - Surface agreement to be signed with land owners. - Check, service and maintain construction vehicles and equipment to minimise the risk of hydrocarbon and chemical leakages and spillages.
	<p>Land use Fragmentation of farm land</p>	Local	<ul style="list-style-type: none"> - Restrict construction activities to demarcated areas and consider all other areas as no-go areas to minimise loss of grazing land. - Do not disturb grave sites. - Ensure that land which is not used during construction is made available for grazing and recreational activities.
	<p>Fauna and Flora Loss of habitat</p>	Local and regional	<ul style="list-style-type: none"> - Service and maintain construction vehicles in order to reduce noise emissions. - Advise persons entering the site not to disturb or harm animals. - Implement a biodiversity action plan that is available as part of the Biodiversity Specialist Report. - Avoid sensitive areas, such as pans and streams banks-no infrastructure within 100m of any road or water course.
	<p>Pans and wetlands Loss or disturbance of habitat through encroachment of mining related activities</p>	Local	<ul style="list-style-type: none"> - Educate employees, contractors and visitors on biodiversity and land management principles. - Planning & Surveying Department to be provided with relevant buffer areas to incorporate in future planning. - Applicable Water Use Licenses should be applied for disturbance of any pans.
	<p>Alien Species Contamination by chemical control agents (users need to be registered and certified for use of dangerous products)</p> <p>Large areas denuded of vegetation (small-scale rehabilitation of denuded areas to be implemented)</p>	Local and regional	<ul style="list-style-type: none"> - Mechanical and chemical methods will be implemented initially to bring about a quick reduction in these species that pose the greatest invasive threat to the area. - Mechanical (tree-felling) and chemical (stump treatment) methods to be implemented. Market for harvested wood to be investigated. - Mechanical methods (hand-pulling) of control to be implemented extensively in the early stages of establishment of the mine. - Annual follow-up operations to be implemented. - Control measures to be implemented on an opportunistic basis. - Landscaping and gardening to be based on the use of indigenous plants only. Alien plants are to be removed whenever possible.
	<p>Biodiversity Loss of biodiversity</p>	Local, regional and national	<ul style="list-style-type: none"> - Conduct rehabilitation. - Provide training in the identification of protected species. - Re-establish using mix of indigenous locally occurring species. - Set up fixed point monitoring sites to check progress of rehabilitation. - Fence off newly rehabilitated areas and protect from grazing until well established.
	<p>Ground water Contamination of ground water</p>	Regional	<ul style="list-style-type: none"> - Implement waste management plan for handling hazardous waste. - Conduct ground water monitoring as per the monitoring plan.

	Air quality Deterioration of air quality	Regional	<ul style="list-style-type: none"> - Rehabilitate and maintain disturbed surfaces that are not going to be utilised after construction. - Promote use of PPE such as dust masks.
	Noise Increase in ambient noise level	Regional	<ul style="list-style-type: none"> - Restrict construction activities to daytime. - Service construction vehicles and equipment on a regular basis to ensure noise suppression mechanisms are functioning. - Construct enclosures/bunds and berms for pumps, generators and other noise generating equipment. - Equip vehicles with noise silencers. - Switch equipment off when not in use. - Demarcate and clearly mark noise zones. - Adhere to occupation health and safety noise limits. - Maintain occupational noise monitoring to determine noise levels from equipment as increased noise may indicate other issues. A noise monitoring programme and grievance procedure must be implemented.
	Visual Visual intrusion	Regional	<ul style="list-style-type: none"> - Use natural colour tones for structures, roofs of buildings will be angled so as to not reflect sunlight and night lightning will be minimised. - Carry adjustments to the siting and design of the project, the careful selection of finishes and colours, the use of earthworks (such as berms) and planting to provide visual screening, as well as dust control where required. Penalties for non-compliance and should be considered. - Screen the site from the surrounding areas by planting fast growing indigenous trees. - Turn lights off using a timer or occupancy sensor or manually when not needed. - Both on-site and off-site landscape rehabilitation of areas affected by the project should be considered. This may include re-instating landforms and natural vegetation, provision of landscaped open space, or other agreed upon facilities.
	Sensitive areas Destruction of sensitive areas	Local	<ul style="list-style-type: none"> - Avoid all identified wetlands and ensure that no activities take place within wetland areas. - Construct catchment dams in areas that drain towards streams and wetlands, in order to contain dirty water and reduce impacts on wetlands. - Conduct monitoring programme for water, soil and biodiversity. - Introduce a hydrocarbon management system to ensure that hydrocarbon pollution is minimised. - Commence with construction during the low floor or during low rainfall in the wet season. - Ensure that infrastructure is constructed outside the 100 year flood line and or within 100m from streams and pans in order to minimise impacts on water courses. - Comply with Regulation 704 of the National Water Act of 1998 for all designs of mine residue disposal infrastructure. - Minimise the removal of vegetation during stripping.
	Traffic and safety	Local	<ul style="list-style-type: none"> - Allocate and adhere to speed limits. - To reduce negative impacts of increased traffic on and around the site. - Restrict traffic to demarcated areas. - Public to be given right of way on public roads and truck contractors shall make use of approved methods to control the movement of vehicles so as not to constitute a road hazard.

			<ul style="list-style-type: none"> - Erect safety signs in the local languages to warn people of the danger on roads. - Keep in constant liaison with the local Department of Roads who will need to be aware of any proposed road plans and who may be able to assist in terms of making recommendations and road maintenance. - Ensure that all site access points are clearly visible from the main road. - Ensure that all drivers employed are certified with appropriate training levels for the required vehicle. - Ensure that all vehicles entering and leaving the site use demarcated routes.
	Surface water Contamination of surface water resources	Regional	<ul style="list-style-type: none"> - Clean surface water or runoff will be prevented from entering dirty areas by diverting it around these areas; - The discharge positions might also require additional reinforcement in the form of a suitably designed gabion or similar structure to prevent erosion at the discharge positions.
	Fauna and flora Loss of natural vegetation and species of conservation value	Local, regional and national	<ul style="list-style-type: none"> - Ensure that vegetation is not unnecessarily removed. - Remove with care and relocate Red Data List Species to avoid destruction. - Manage and control plant species declared as invasive and declared weeds.
Operational activities Control measures are to be applied during the implementation of respective activities	Air quality Deterioration in air quality	Local	<ul style="list-style-type: none"> - Minimise the removal of vegetation in order to reduce the possibility of dust pollution. - Vegetate topsoil stockpiles as soon as possible to reduce dust and particulate emissions. - Locate topsoil stockpiles in order to reduce its exposure to wind, thereby reducing the likelihood of particle entrainment. - Spray road surfaces with water and treat it with a dust binding agent to minimise emissions of fugitive dust. The type of dust-binding agent should determine the amount of watering.
	Topography Change in surface topography	Local	Engineer and environmental consultant should supervise vegetation and rehabilitation activities in accordance with post mining topographical plan.
	Land capability Loss of land capability	Local	<ul style="list-style-type: none"> - Plan all construction activities to prevent the incorrect stripping of topsoil which leads to the reduction in land capability. - Restrict all construction activities to demarcated areas.
	Soils Loss of soil fertility	Local	<ul style="list-style-type: none"> - Vegetate soil stockpiles and berms to minimise the risk of erosion. - Implement erosion control measures, such as contour banks in the area prone to erosion, including slopes and uneven ground; c) Vegetate preferential flow paths of storm water runoff. - Remove soils in dryer months, due to their increased susceptibility to compaction and erosion during rains. - Separate topsoil (A horizon) and sub-soils (B horizon) where possible and stockpile separately. - Construct berms around soil stockpiles in order to divert water away from the stockpile to prevent erosion. - Restrict stockpile height to less than 3m and shape to reduce soil compaction. - Minimise the removal of topsoil in order to reduce dust and particulate emissions.
	Surface water Deterioration in water quality	Regional	<ul style="list-style-type: none"> - Ensure that construction activities are at least 100m from wetlands and floodlines. - Stabilise soil stockpiles with vegetation in order to reduce exposure to erosion and minimise the

			effects of slit loading of surface water running over exposed soil.
	Surface water Deterioration of a water resource	Regional	<ul style="list-style-type: none"> - Measures to reduce the pressure on water resources include actions such as:- <ul style="list-style-type: none"> ✓ Optimising the recycling and re-use of water; and ✓ Minimising losses. - These can be accomplished in many ways, but with the following aspects being recommended for this site:- <ul style="list-style-type: none"> ✓ Maximum re-use of water from the return water dam. - Dispose of domestic and hazardous waste originating from temporary and permanent offices and workshops at an authorised landfill facility to minimise the risk of surface water pollution. - Dispose of hazardous waste and effluent at an authorised landfill facility.
	Ground water Contamination of ground water	Regional	<ul style="list-style-type: none"> - Check, service and maintain construction vehicles and equipment used during infrastructure construction to reduce the risk of hydrocarbon and chemical leakages and spillages. - Contain and remediate hydrocarbon or chemical leakages and spillages to prevent leaching into the ground water. - Develop an emergency spill response plan and train all construction contractors in the emergency spill response procedure.
	Fauna and flora Loss of natural vegetation and species of conservation nature	Local, regional and national	<ul style="list-style-type: none"> - Plan and construct strip areas carefully to minimise the impact on flora species. - Avoid the unnecessary removal of vegetation. - Set and enforce speed limits to prevent accidental injury or death to animals. - Restrict vehicles to road and demarcated areas to prevent damage to vegetation. - Prevent disposal of waste in non-designated areas and the reputable clearing and disposal of any such waste, as these can cause harm to animals, particularly poisonous waste and plastics.
	Noise Noise disturbance	Local	<ul style="list-style-type: none"> - Restrict operational activities to normal working hours. - Service vehicles and equipment on a regular basis to ensure noise suppression mechanisms are functioning. - Limit the speed of vehicles to 40km/h. - Train workers in safety and the use of personal protective equipment to prevent damage to their hearing.
SOCIO-ECONOMIC IMPACTS			
Construction, operational and decommissioning Control measures are to be applied during the implementation of respective activities	Socio-Economic negative impacts on employment and loitering of people in the area resulting in lack of security and safety	Local and regional	<ul style="list-style-type: none"> - Where possible local service providers and workers will be recruited during the construction phase. - Ad-hoc, informal recruitment at the gate or through other unapproved channels by setting up recruitment stands in built up areas will be prohibited. - A skills audit should also be undertaken to determine local skills available. - HIV/AIDS awareness programmes/ Voluntary Counselling & Testing Program will be introduced. - Stakeholder database will be established to identify partners and develop collaborative networks. - Uncontrolled settlement of contractors outside of the site will be prevented. - The recruitment selection process to promote

			gender equality and the employment of women wherever possible.
	Interested and affected parties Lack of communication with stakeholders and loss of trust	Local and regional	<ul style="list-style-type: none"> - Implementation of EMP recommendations, involvement of communities in LED initiatives, ongoing communication to provide feedback and updates. - IAPs must be kept up to date on any changes to transport routes and increase in truck frequency or of alternative routes. - A complaints management system should be maintained by the mine to ensure that all issues raised by community members are followed up and addressed appropriately.
	Heritage resources Destruction of heritage resources	Local	<ul style="list-style-type: none"> - In the event that any major features such as a burial or cache of ostrich eggshell flasks is uncovered during mining operation, an archaeologist should be called in to evaluate the finds. - A buffer zone from all graves and grave yards close to construction activities will be established. - The mine will not hinder easy and safe access for relatives to the grave yards. - In the event of an archaeological artefact being unearthed, an accredited archaeologist will inspect the site and make recommendations. - Promote archaeological awareness and investigate sustainable initiatives with communities to promote the local culture.
	Land use Loss of land use Proliferation of alien invasive species	Local	<ul style="list-style-type: none"> - Incorporate an alien invasive eradication and control programme into the rehabilitation efforts. This programme should be formulated according to relevant legislation. - All temporary infrastructure will be demolished during closure.
	Employment Loss of jobs and employment	Local and regional	<ul style="list-style-type: none"> - Opportunities for additional resources and redeployment, integration of employees and communities into sustainable LED projects, equip suppliers through mentoring and training. - Increased employment opportunities during decommissioning for local contractors. - Where short term employment opportunities exist during decommissioning, local contractors and jobs seekers will receive preference. - The workforce should undergo multiple skills training during the operation of the mine so that they can be productively absorbed into the local economy after mine closure. - Where retrenchments are unavoidable, they will be managed humanely according to legislative requirements. - There should be adherence to the objectives and management measures stated with the Social and Labour Plan. - The workforce should be empowered to develop skills that will equip them to obtain employment in other sectors of the economy. - The LED plan should be implemented to assist local business development. - Local partners should be supported to diversify economy and decrease dependence on mining. - A strategy for saving jobs and management of downscaling and/or retrenchment should be implemented. - Assistance should be given for help with redeployment of retrenches in other operations or assistance with alternative livelihood strategies. - Identify and implement training needs and training

			programmes for decommissioning and closure. - Consultation with communities and local government on future uses for the infrastructure and facilities should be implemented.
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e) Impact Management Outcomes

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

Table 12: Impact management outcomes

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS

Please refer to the above table in section ix.

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraph (c))

Table 13: Impact management actions

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS

Please refer to the above table in section ix.

i) Financial Provision

(1) Determination of the amount of Financial Provision

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

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas should be left in a stable, self-sustainable state. Proof of this should be submitted at closure. Specific objectives include:

Rehabilitation of infrastructure areas

The objective for the removal of infrastructure and the subsequent rehabilitation of the areas they occupied include:

- To ensure that infrastructure identified for removal is successfully demolished and removed.
- To ensure that infrastructure identified to remain after mine closure is maintained until the issue of a closure certificate.

The removal, decommissioning and disposal of all mining infrastructure, will comply with all conditions contained in the MRPDA. To this end, decommissioning and rehabilitation of all infrastructure areas will follow the following principles:-

- The plant and associated disused infrastructure will be dismantled or demolished. Any building foundations will be removed and land exposed to the demolition and dismantling of infrastructure and all other disturbed land will be rehabilitated
- Rubble will be disposed of at a suitable site. The site will be selected in consultation with DENC.
- Any surface water management infrastructure will be maintained to ensure they are stable and functional.
- Just before closure, when disturbed land has been rehabilitated and erosion is controlled by vegetation cover, all disused surface water management facilities will be decommissioned.

Mine residue deposits

The mine residue deposits comprise of a slimes dam. The objectives pertaining to the effective management and rehabilitation of the slimes dam include:

- To ensure that the mine residue deposits are stable and that there is an acceptably low risk of failure of these deposits during the decommissioning phase and following mine closure.
- To establish self-sustainable vegetation cover on the slimes dam so that the visual impact of the slimes dam is improved and in order to prevent erosion.

Management principle pertaining to the slimes dam includes:

- The slimes dam/s will continuously be inspected by a suitable qualified professional engineer to ensure their stability. If they are unstable, the appropriate remedial measures will be implemented.
- Inspection and monitoring should continue until a suitable qualified professional engineer has confirmed the long-term stability of the slimes dam.
- Any infrastructure or facilities that serve the slimes dam will be maintained to ensure that they are both stable and functional.

Maintenance

The necessary agreements and arrangement will be made by Diamond Dump Recoveries CC to ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state or for three (3) years after closure or as long as deemed necessary at the time.

- Such processes include erosion of the slimes dams, rehabilitated surfaces, surface water drainage, air quality, surface water quality, ground water quality, vegetative re-growth, weed encroachment.
- The closure plan will be reviewed yearly.
- Rehabilitation of the land will be maintained until a closure certificate is granted or until the land use is regarded as sustainable.
- All rehabilitated areas will be monitored and maintained until such time as required to enable the mine to apply for closure of these different areas.

Audit Reports / Performance assessments

As per the MPRDA and associated Regulations, this Environmental Management Programme will be continually assessed in terms of its appropriateness and adequacy. In order to achieve this, Diamond Dump Recoveries CC will undertake the following:

- Implement the necessary monitoring programmes, as discussed as part of this EMPR;
- Conduct performance assessments of this EMPR as required by the MPRDA and associated Regulations; and
- Compile and submit the afore-mentioned performance assessment reports to the DMR. The frequency of the performance assessments will occur every year. An independent and competent person will undertake all performance assessments.

Decommissioning and closure objectives

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas will left in a stable, self-sustainable state. Proof of this will be submitted at closure. Specific objectives include:

- To identify potential post-closure land uses in consultation with the surrounding land owners and land users. This should be done during the operational phase of the mine.
- Rehabilitate disturbed land to a state suitable for its post-closure uses.
- Rehabilitate disturbed land and mine residue deposits to a state that facilitates compliance with applicable environmental quality objectives.
- Limit the impact on staff whose positions become redundant at the time of mine closure.
- Keep relevant authorities informed of the progress of the decommissioning phase.
- Submit monitoring data to the relevant authorities.
- Maintain required pollution control facilities and rehabilitated land until closure.

Negative economic impacts

The objective is to alleviate the negative socio-economic impacts that will result from mine closure. Management principles to achieve this include:

- Diamond Dump Recoveries CC will undertake a carefully planned step-wise decommissioning process.
- Closure planning will form an integral part of mine planning.
- Strategies for sustainable development of surrounding towns have been and will continue to be developed by the project in collaboration with district and local authorities, local businesses and other interested parties. Early warning of impending closure will be given to IAPs.
- In conjunction with long-term closure planning, the mine will actively participate in regional and local planning to enhance the economic benefits of the project through development of alternative forms of income generation.
- Diamond Dump Recoveries CC will initiate and participate in regional planning exercises that will mitigate the impacts of closure of the mine, the local and regional economies and associated abandonment of community infrastructures surrounding the mine.
The mine will fulfil the requirements for closure and the management of downscaling.

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

Please see Table 4 above. The surface owners were personally visited and all neighbours were consulted with registered letters with background documents were mailed to them with a comment form to send back. A site notice was placed at the farm gate and at the Spar in Douglas. A notice was also placed in the local newspaper, the DFA to invite any interested and affected parties to come forward and register and another notice was placed to notify any interested and affected parties about the meeting that was held at the Skuur in Douglas.

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

Infrastructure Areas

On completion of the prospecting operations, the various surfaces, including the access road, the office area, storage areas and the screening plant site should finally be rehabilitated as follows:

- All remaining material on the surface should be removed to the original topsoil level. This material should then be backfilled into the depressions. Any compacted area should be ripped to a depth of 300mm, where possible, the topsoil or growth medium returned and landscaped.
- All infrastructures, equipment, screening plant, and other items used during the operational period should be removed from the site.
- On completion of operations, all buildings, structures or objects on the office site should be dealt with in accordance with Regulation 44 of the Minerals and Petroleum Resources Development Act, 2002.

Topsoil and Stockpile Deposits

Disposal Facilities: Waste material of all description inclusive of receptacles, scrap, rubble and tyres should be removed entirely from the mining area and disposed of at a recognized landfill facility. It should be permitted to be buried or burned on the site.

Ongoing Seepage, Control of Rain Water: It is not foreseen that any monitoring of ground or surface water should take place after mine closure, except if so requested by the DWS – Northern Cape.

Long Term Stability and Safety: It should be the objective of mine management to ensure the long term stability of all rehabilitated areas including the backfilled depressions. This should be done by the monitoring of all areas until a closure certificate has been issued.

Final rehabilitation in respect of erosion and dust control: Self-sustaining vegetation will result in the control of erosion and dust and no further rehabilitation is deemed necessary, unless vegetation growth is not returned to a desirable state by the time of mine closure.

Final Rehabilitation Roads

- After rehabilitation has been completed, all roads should be ripped or ploughed, fertilized and seeded, providing the landowner does not want them to remain that way and with written approval from the Director: Mineral Development of the Department of Mineral Resources. No new roads will be established. Sufficient existing roads exist.

Submission of Information

- Reports on rehabilitation and monitoring should be submitted annually to the Department of Mineral Resources – Free State, as described in Regulation 55.

Maintenance (Aftercare)

- Maintenance after closure should include the regular inspection and monitoring and/or completion of the re-vegetation programme.
- The aim of the Environmental Management Programme is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.
- The aim with the closure of the mine should be to create and acceptable post-mine environment and land-use. Therefore all agreed commitments should be implemented by Mine Management.

After-effects Following Closure

Long Term Impact on Ground Water: No after effect on the groundwater yield or quality is expected.

Long Term Stability of Rehabilitated Land: One of the main aims of any rehabilitated ground should be to obtain a self-sustaining and stable end result. The concurrent cleaning of all tailings material and replacement of topsoil where available should be ensured.

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

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

The removal of waste material of any description from the mining area and the disposal thereof at a recognised landfill facility.

- ❖ The removal of infrastructure, equipment, plant and other items from the site.
- ❖ The ripping of compacted areas to a level of 300mm and the levelling of such areas in order to re-establish a growth medium

for plants (such areas will furthermore be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to the prospecting operation, if the re-establishment of vegetation is unacceptably slow.

- ❖ The backfilling of the final excavations with subsoil and the covering thereof with previously stored topsoil (where-after this area will also be seeded with a vegetation seed mix adapted to reflect the local indigenous flora that was present prior to the proposed operation, and seedlings protected for a period of one) if the re-establishment of vegetation is unacceptably slow.

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

The bank guarantee to be submitted to the DMR for mine closure and rehabilitation is to the value of R301 303.

Please see calculations below.

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (Including overland conveyors and powerlines)	m3	198	12.21	1	1	2 417.58
2 (A)	Demolition of steel buildings and structures	m2	215	170.13	1	1	36 577.95
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	250.72	1	1	-
3	Rehabilitation of access roads	m2	2500	30.44	1	1	76 100.00
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	296.49	1	1	-
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	161.18	1	1	-
5	Demolition of housing and/or administration facilities	m2	0	340.26	1	1	-
6	Opencast rehabilitation including final voids and ramps	ha	0.188	173174.97	0.52	1	16 884.56
	50 pits 25m X 15 m only 5 open at any time		0.188	173174.97	0.52	1	16 884.56
				173174.97	0.52	1	-
				173174.97	0.52	1	-
				173174.97	0.52	1	-
				173174.97	0.52	1	-
				173174.97	0.52	1	-
				173174.97	0.52	1	-
				173174.97	0.52	1	-
7	Sealing of shafts adits and Inclines	m3	0	91.33	1	1	-
8 (A)	Rehabilitation of overburden and spoils	ha	0.3	118912.29	1	1	35 673.69
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0.3	148103.1	1	1	44 430.93
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	430161.62	1	1	-
9	Rehabilitation of subsided areas	ha	0	99571.13	1	1	-
10	General surface rehabilitation	ha	0.3	40000	1	1	12 000.00
11	River diversions	ha	0	94198.59	1	1	-
12	Fencing	m	0	107.45	1	1	-
13	Water management	ha	0	35916.95	1	1	-
14	2 to 3 years of maintenance and aftercare	ha	0.3	12535.93	1	1	3 760.78
15 (A)	Specialist study	Sum	0			1	-
15 (B)	Specialist study	Sum				1	-
Sub Total 1							227 845.49
1	Preliminary and General		13 670.73		weighting factor 2 1		13670.72913
2	Contingencies			22784,54856			22784,54856
Subtotal 2							264300.76
VAT (14%)							37002.11
Grand Total							301303

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

Diamond Dump Recoveries will fund the planned prospecting programme on Remainder of the farm Kransfontein 19, Hopetown. The planned prospecting programme has an expected cost of R301303. Diamond Dump Recoveries has the necessary fund available (please see attached bank statement).

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

- g) **Monitoring of Impact Management Actions**
- h) **Monitoring and Reporting Frequency**
- i) **Responsible persons**
- j) **Time Period for Implementing Impact Management Actions**
- k) **Mechanisms for Monitoring Compliance**

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Topography	To minimise the reduction of land capability.	To ensure that rehabilitation post-mining slopes are stable, free draining and no slopes have an angle in excess of 20°.	Site Manager/ Environmentalists	Monitoring will be done on an <i>annual basis</i> to ensure that the levels and the slopes are in order.
Soil	To prevent soil pollution; To limit soil compaction; To curb soil erosion; and To reinstate a growth medium able to sustain plant life.	Soil depth and chemical composition will be tested and possible erosion damage will be assisted and rectified.	Site Manager/ Environmentalists	Monitoring will be done on an <i>annual basis</i> or after a heavy rain event.
Air Quality	To control the incidence of unacceptable levels of dust pollution on site.	To ensure that the mine minimizes dust omissions, so that dust does not become a nuisance for affected parties and a health hazard.	Site Manager/Foreman appointed SHE Consultant	Visual inspections will be done and managed by dust suppression by a water tanker. Quarterly tests will also be conducted by a Safety Health and Environmental Consultant and submitted to Mine Health and Safety for monitoring purposes.
Fauna	To minimise vegetation destruction in drill, areas, and therefore a habitat for wildlife; and To eliminate poaching and the extermination of animal species within the boundaries of the study area as well as the surrounding areas.	To ensure that the species diversity and abundance is not significantly reduces.	Site Manager/ Environmentalists	Monitoring will be done at rehabilitated area on an <i>annually basis</i> to investigate species diversity and abundance.
Flora	To minimise the destruction of vegetation units; and To control invasion of exotic and invasive plant species.	To ensure that the rehabilitated areas become self-maintaining.	Site Manager/ Environmentalists	Monitoring will be done at the rehabilitated areas on a <i>twice a year basis</i> (mid-summer and mid-winter), where species diversity and

				vegetation cover will be investigated.
Noise	To control the incidence of unacceptable noise levels on site.	The management objective will be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the plant and that which may migrate outside the plant area.	Site Manager/Foreman appointed SHE Consultant.	quarterly reports on fall-out noise monitoring will be conducted as required by legislation. If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.
Surface Water	To conserve water; and To eliminate the contamination of run-off.	There are no sources in the vicinity of the mine. But if water is encountered in the excavations monitoring will be done.	Site Manager/Water Supply	Monitoring will be done to monitor the quality of the surface water collecting in excavations if ground water is encountered.
Ground Water	To minimise and prevent as far as practically possible the contamination of ground water.	No ground water is used, but if groundwater is encountered in excavations monitoring will be done.	Site Manager/Water Supply	Monitoring will be done to monitor the levels and quality when groundwater is encountered in excavations.

Monitoring plan for the Diamond Dump Recoveries operation

ACTION	METHOD
Monitoring the re-vegetation of: <ul style="list-style-type: none"> ▪ Mine out and rehabilitated areas. ▪ Levelled and rehabilitated dumps. ▪ Old roads. ▪ Rehabilitation plots. ▪ Cleared areas. 	Foot inspection
Monitoring of erosion at: <ul style="list-style-type: none"> ▪ Roads ▪ Mine residue dam ▪ Dumps ▪ Pumps and pipelines ▪ Drainage lines ▪ Any other area where erosion occurs 	<ul style="list-style-type: none"> ▪ Visual inspection ▪ Walk over rehabilitated areas ▪ Drive along roads ▪ Check pipelines and pumps, mine residue dam and dumps ▪ Photographic records
Monitoring of alien invasive plants	<ul style="list-style-type: none"> ▪ Visual inspection on foot ▪ Map presence of invasive plants ▪ Plan removal and document area covered on a monthly basis ▪ Photographic records
Monitoring of water quality from suggested points	<ul style="list-style-type: none"> ▪ Chemical and bacteriological tests at identified points ▪ Build up database and graph the results ▪ Compare with limits and take action on non-conformance
Monitoring of rehabilitated areas	Survey and map new rehabilitated areas
Evaluate compliance with gradients and variation in topography	Plot, map and calculate areas treated
Monitor the stability of the mine residue deposit	Follow specifications in mandatory code of

and water storage facilities	practise for slimes dam
Monitoring of disposal of metal scrap, old oil, oil filters, old oil drums, oily cloths, batteries, fluorescent tubes, tyres and contaminated soil	<ul style="list-style-type: none"> ▪ Record each load sent off ▪ Give used oils to oil recycling companies ▪ Ensure safe disposal certificates are obtained from suppliers if the materials are given back to them
Monitoring of maintenance of general waste disposal	Running of total of loads of waste taken to the Prieska waste disposal site
Monitoring of conditions of the septic tanks/sewage works	<ul style="list-style-type: none"> ▪ Visual inspection ▪ Record conditions
Monitoring of conditions of bunded areas around diesel fuel tanks, refuelling areas, old oil tanks, storm water facilities	Visual inspection
Monitoring of water use related activities in terms of Section 21 of the NWA	<ul style="list-style-type: none"> ▪ Record total water use by recording flow meters ▪ Ensure compliance with licences
Ground water monitoring	<ul style="list-style-type: none"> ▪ There are no usable boreholes on the prospecting area.

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

Annual Performance Assessment or Environmental Audit Reports will also be conducted and submitted.

m) Environmental Awareness Plan

The objective of the environmental awareness plan is to ensure that:

- ✓ Training needs are identified and all personnel whose work may create a significant impact upon the environment have received appropriate training.
- ✓ All employees are aware of the impact of their activities.
- ✓ Procedures are established and maintained to make appropriate employees aware of:
 - The significant environmental impacts (actual or potential) of their work activities and environmental benefits of improved personal performance.
 - Their roles and responsibilities in achieving conformance with environmental policies, procedures, and any implementation measures.
 - The potential consequences of departure from specified operation procedures.
- ✓ Personnel performing task, which can cause significant environmental impacts, are competent in terms of appropriate education, training and / or experience.

Environmental awareness will be part of the existing training and development plan. Key personnel with environmental responsibilities will be identified and the following principles will apply:

- ✓ Procedures will be developed to facilitate training of employees, on-site service providers and contractors;
- ✓ Environmental awareness will focus on means to enhance the ability of personnel and ensure compliance with the environmental requirements;
- ✓ Top management will build awareness and motivate and reward employees for achieving environmental objectives;
- ✓ Environmental policies will be available to contractors;
- ✓ Environmental inductions will be conducted for employees, contractors and visitors;
- ✓ There will be an ongoing system of identifying training needs

General environmental awareness training as part of the induction at Diamond Dump Recoveries should focus on the following:

- ✓ General environmental awareness.
- ✓ The mine policies and vision concerning environmental management.
- ✓ Legal requirements.
- ✓ Mine activities and their potential impacts.
- ✓ Different management measures to manage identified impacts.
- ✓ Mine personnel's role in implementing environmental management objectives and targets.

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

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

Environmental Awareness Training Programme Procedure

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

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

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

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

- **RESOURCE MANAGEMENT**
 - a. The importance of saving water
 - i. South Africa is a water scarce country and rivers are polluted
 - ii. Do not throw litter into river or water drains
 - iii. Do not dispose of oils in sewers
 - b. Air pollution - Climate change
 - i. The use of fossil fuels is increasing the amount of greenhouse gases that are discharged to the atmosphere. Share transport or use public transport
 - ii. Don't burn any rubbish, the smoke pollutes the air
 - iii. Plant trees, they clean the air, provide us with oxygen and remove the greenhouse gas carbon dioxide from the air.
 - c. Soil conservation
 - i. Prevent overgrazing of farmlands, keep vegetation on the surface of the land to prevent soil erosion
 - ii. Plant trees
- **HAZARDOUS SUBSTANCE USE AND STORAGE**
 - a. Solvent, petrol, diesel, insecticides, chlorine, detergents, chemical fertilisers are harmful to the environment and to your health. Use them sparingly and do not let them get into the water systems. Containers must be disposed of to a licensed hazardous waste disposal facility.
 - b. Hazardous substances must be stored and used correctly.
 - c. Ensure that 16 point Material Substances Safety Data Sheets (MSDS) are available at point of store.
 - d. Compressed gas storage requirements.
 - e. Flammable substances store requirements.
- **INCIDENT AND EMERGENCY REPORTING**
 - a. The company must have an emergency/incident reporting system whereby environmental incidents can be reported and actioned to mitigate and follow up on.
- **OIL / DIESEL / PETROL SPILL CLEAN UP**
 - a. All employees who work with machines and vehicles must be instructed how to prevent and clean up an oil or diesel spill appropriately. Spill kits must be available in close proximity on site, drip trays must be used when servicing vehicles.

- **CONSERVATION OF WATER**
 - a. Campaign to save water on site.
 - b. Clean water is expensive and potable water must be used carefully.
 - c. Prevent pollution of water by preventing spills and dispose of wastes properly.

- **CONSERVATION OF VEGETATION**

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

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

- **WASTE MANAGEMENT**
 - a. Employees must be instructed on how to tell the difference between hazardous waste and general waste.
 - b. They must know how to separate hazardous and general waste and where to dispose of these wastes in the correct way.
 - c. Examples of hazardous waste which must be recycled or sent to Waste Tech/ waste management company for disposal:
 - i. Oil, diesel, batteries, acids, paint, thinners, electronic waste.
 - ii. Pesticides, jik Handy Andy.
 - iii. Old oil, old oil filters, old paint is hazardous and must not be disposed of to a general land fill. Oilkol/ Olegra of the Rose Foundation will collect old oil.
 - iv. Mercury in fluorescent light bulbs is hazardous, fluorescent lights must be handled with great care so as not to break the glass and release the mercury vapour into the air to breathe.

- d. Examples of general wastes which can go to the municipal landfill.
 - i. Wood, paper, plastic, glass, old PPE.
- e. Recycle, Reuse, Reduce, Recover wherever possible.

- **CONCLUSION**

The management of Diamond Dump Recoveries CC will utilize the Environmental Awareness Plan to assure that all employees and contractors are aware of the environment and know how to manage it correctly.

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

Air quality:

- To control the incidence of unacceptable levels of dust pollution on site.

Surface water:

- To conserve water; and
- To eliminate the contamination of run-off.

Ground water:

- To minimise and prevent as far as practically possible the contamination of ground water.

Natural flora:

- To minimise the destruction of vegetation units; and
- To control invasion by exotic and invasive plant species.

Fauna:

- To minimise vegetation destruction in drill areas, and therefore a habitat for wildlife; and
- To eliminate poaching and the extermination of animal species within the boundaries of the study area, as well as in the surrounding areas.

Noise:

- To control the incidence of unacceptable noise levels on site.

Aesthetics:

- To minimise aesthetic disturbance; and
- To reduce the visual impact of the proposed prospecting operation through a process of on-going rehabilitation and reclamation.

Soils:

- To prevent soil pollution;

- To limit soil compaction;
- To curb soil erosion; and
- To reinstate a growth medium able to sustain plant life.

Land capability:

- To minimise the reduction of land capability.

Sensitive landscapes:

- To protect sensitive landscapes from potential negative impacts.

Surface environment - waste management:

- To ensure that the discarding of any waste material produced as a result of the proposed mining operation, including rubble, litter, garbage, rubbish or discards of any description, whether solid or liquid, takes place only at a site or sites demarcated for such purposes.
- To prevent waste material from being dumped within the borders or the vicinity of the prospecting area.

n) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually)

Section 41 of the MPRDA and regulations 53 and 54 promulgated in terms of the MPRDA deal with financial provision for mine rehabilitation and closure.

The holder of a right as described in the relevant sections of the MPRDA and its regulations must provide the Department of Mineral Resources (DMR) with sufficient financial provision. Officials in the DMR Regional Offices are required to assess, review and approve the quantum of financial provision submitted (that is, the monetary value of the financial provision that has been computed by the holder of a prospecting right, mining right or mining permit during the annual review) as being sufficient to cover the environmental liability at that time and for closure of the mine at that time.

The holder of a prospecting right, mining right or mining permit is required to annually assess the total quantum of environmental liability for the mining operation and ensure that financial provision are sufficient to cover the current liability (in the event of premature closure) as well as the end-of-mine liability.

It is hereby confirmed that the financial provision will be reviewed annually.

2) UNDERTAKING

The EAP herewith confirms

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

-END-