



mineral resources

Department:

Mineral Resources

REPUBLIC OF SOUTH AFRICA

BASIC 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: **MYSTIC PEARL 157 (PTY) LTD**

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FILE REFERENCE NUMBER SAMRAD: **(NC) 30/5/1/1/2/11750 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 BASIC ASSESSMENT PROCESS

The objective of the basic 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) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives;
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:-
 - (i) the nature, significance, consequence, extent, duration and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts—
 - (aa) can be reserved;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be managed, avoided, or mitigated.
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

PART A
SCOPE OF ASSESSMENT AND BASIC 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.:	086 762 7142
E-mail address:	roosthuizen950@gmail.com

ii) Expertise of the EAP

(1) The qualifications of the EAP

(with evidence)

Masters in Environmental Management (UFS)
B-Comm in Human and Industrial- Psychology (NWU)
Waiting for registration please attached resume and MEM certificate.
(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:	A Portion of Portion 1 of the Farm Vooruitzicht 81, Kimberley District Farm No.: 81 Portions: A Portion of Portion 1 Farm Name: Vooruitzicht Magisterial District: Kimberley Province: Northern Cape Title Deed No.: T4349/2001
Application area (Ha):	253.6919 ha (two five three hundred comma six nine one nine hectares)
Magisterial district:	Kimberley
Distance and direction from nearest town:	The Vooruitzicht farm is situated in the Kimberley District and lies about 2.5km west of Kimberley on the outskirts of the city.
21 digit Surveyor General Code for each farm portion:	C037000000000081000001

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

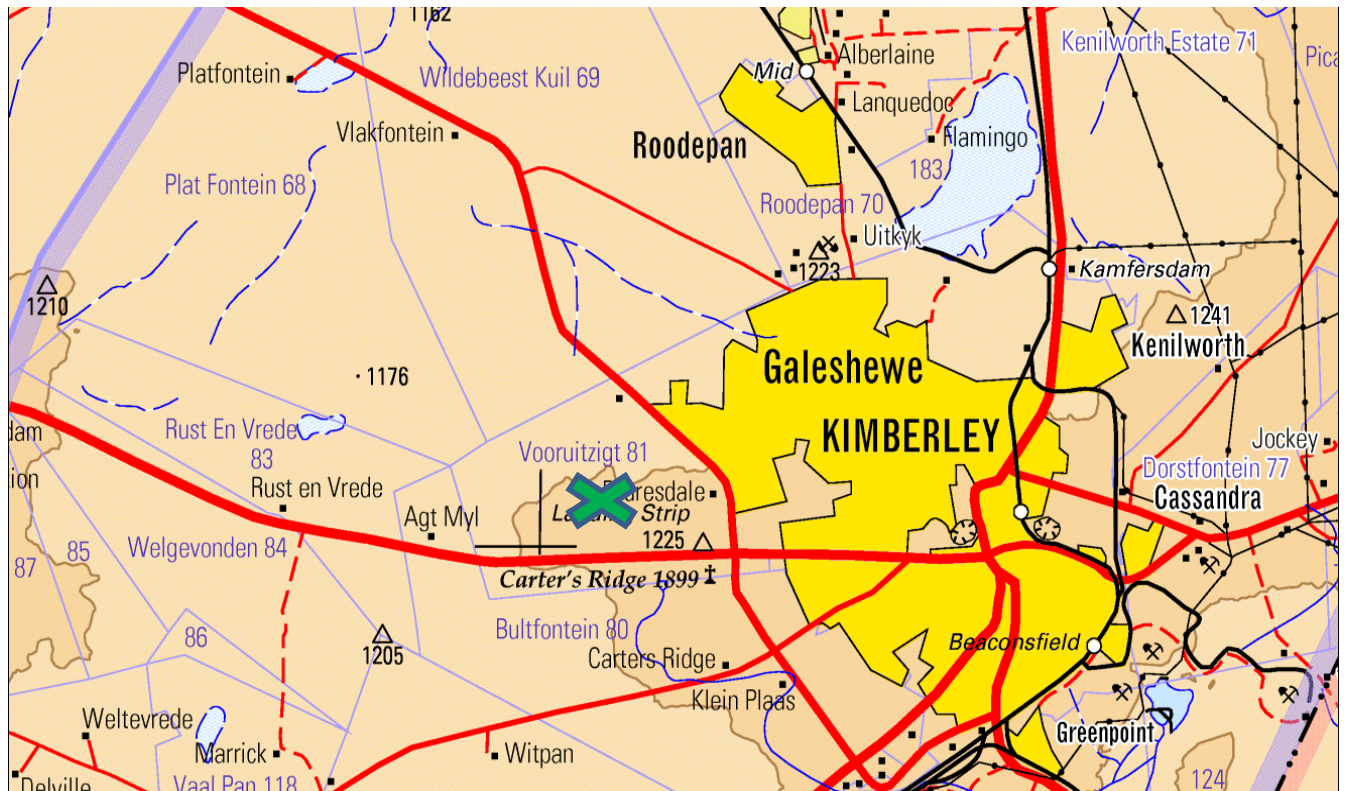


Figure 1: Locality Map on 2824 Kimberley 1:250 000 the area is indicated with green cross

- 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 2a: Map showing the aforesaid areas for main and listed activities, and infrastructure to be placed on site

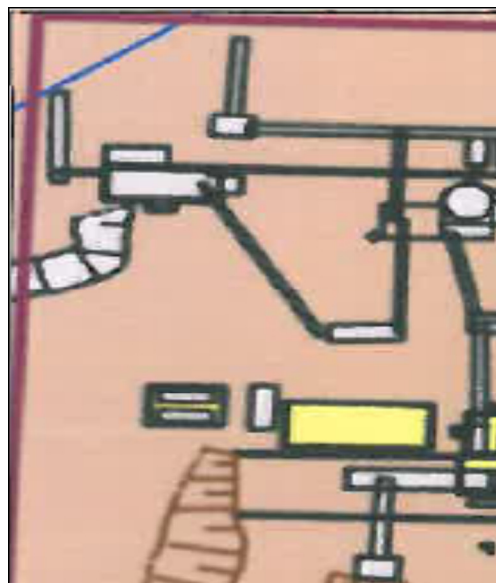


Figure 2b: Map showing the aforesaid detail of the plant area of which the exact location will only be determined after some prospecting phases have been finalized.

i) **Listed and specified activities**

Table 1: Listed and Specified Activities

NAME OF ACTIVITY e.g. for prospecting – drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route, etc...etc...etc. e.g. for mining – excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
Any activity including the operations 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 28 of 2002) Activity 20 of Listing Notice 1	253.6919 ha	X	GNR 893
The removal and disposal of minerals contemplated in terms of Section 20 of the Minerals 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) Activity 19 of Listing Notice 2	253.6919 ha	X	GNR 984
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 of this Notice applies. Activity 21 of Listing Notice 2	0.15 ha	X	GNR 984
Excavations being prospected or in the process of being rehabilitated	0.5 ha		Not Listed
Temporary structures (2 x Park Homes)	0.075 ha		Not Listed
Temporary dump	0.04 ha		Not Listed
Roads to the trenches and processing	1.5 ha		Not Listed

plant			
A mine Residue Dam	1 ha		Not Listed
A water pipeline of unknown length but less than 1000m	1000m		Not Listed
Concrete pollution control at diesel tanks and old oil storage and wash bay	150m 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 prospected/mined and for a linear activity, a description of the route of the activity)

Table 2: Description of the activities

ITEM	DESCRIPTION
Environmental attributes.	The site will be visited and a proper foot survey will be conducted. The activities that will be conducted by the applicant will be discussed on site as described in the Prospecting Work Programme attached to the Prospecting Right application. The environmental setting on site and the surrounding area will give the EAP with his or her experience an idea and lead to environmental attributes.
Identification of impacts and risks.	The activities that will take place according to the Prospecting Work Programme will be discussed in detail with the applicant on site. With the specific environmental setting in mind and more specifically, the type of soil, soil depth, land use, vegetation types, and distance to open water and structures, the EAP will be able to identify the potential impact areas where significant impacts might occur and the risks thereof. The methods of rehabilitation that need to be implemented, in order to meet the objective of the final land use will also be taken in consideration.
Consideration of alternatives.	<p>ALTERNATIVE PROSPECTING METHODS 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.</p> <p>CONSEQUENCE IF NOT PROCEEDING WITH THE OPERATION The current operation makes provision for 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.</p>
Process to assess and rank impacts.	<p>The site will be visited before the EMP is compiled. The different site alternatives will be discussed with the applicant on site. The entire application area will be visited and areas that might be environmentally sensitive will also be discussed.</p> <p>The EAP with more than 20 years' experience in prospecting and mining activities will assess the site for possible impacts.</p> <p>ASSESSMENT CRITERIA TERMINOLOGY The assessment of the impacts has been conducted according to a synthesis of criteria required by the integrated environmental management procedure.</p> <p><i>Nature of Impact</i> This is an appraisal of the type of effect the activity would have on the affected environmental component. Its description should include what is being affected, and how.</p> <p><i>Extent</i> The physical and spatial size of the impact. This is classified as</p>

follows:

- **Local**
The impacted area extends only as far the activity, e.g. a footprint.
- **Site**
The impact could affect the whole, or a measurable portion of the property.
- **Regional**
The impact could affect the area including the neighbouring farms, transport routes and the adjoining towns.
- **Cumulative**
The impact could have a cumulative effect with the surrounding land uses.

Duration

The lifetime of the impact which is measured in the context of the lifetime of the proposed phase (i.e. construction or operation).

- **Short Term**
The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.
- **Medium Term**
The impact will last up to the end of the prospecting period, where after it will entirely negated.
- **Long Term**
The impact will continue or last for the entire operational life of the mine, but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent**
The only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

Intensity

This describes how destructive, or benign, the impact is. Does it destroy the impacted environment, alter its functioning, or slightly alter it. These are rated as:

- **Low**
This alters the affected environment in such a way that the natural processes or functions are not affected.
- **Medium**
The affected environment is altered, but function and process continue, albeit in a modified way.
- **High**
Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

This will be a relative evaluation within the context of all activities and the other impacts within the framework of the project.

Probability

	<p>This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:</p> <ul style="list-style-type: none"> ▪ Improbable The possibility of the impact occurring is very low, due either to the circumstances, design or experience. ▪ Probable There is a possibility that the impact will occur to the extent that provisions must be made therefore. ▪ High Probable It is most likely that the impacts will occur at some or other stage of the development. ▪ Definite The impact will take place regardless of any preventative plans, and mitigation measures or contingency plans will have to be implemented to contain the impact. <p><i>Determination of Significance</i> Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The classes are rated as follows:</p> <ul style="list-style-type: none"> ▪ No significance The impact is not likely to be substantial and does not require any mitigatory action. ▪ Low The impact is of little importance, but may require limited mitigation. ▪ Medium The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels. ▪ High The impact is of importance. Failure to mitigate, with the objective to reduce the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.
<p>Contribution of Specialist Reports.</p>	<p>An Archaeologist has been instructed to do a survey on the farm for archaeological sensitive areas, the applicant are still waiting for him to conduct the survey. All information will be used to identify areas that be sensitive and to make the necessary provision to avoid these areas. Any other specific specialist reports will be done when specifically requested by any Department or interested and affected party consultation referred to.</p>
<p>Determination of Impact Management Objectives and Outcomes.</p>	<p>The Nature of the Impact: This is an appraisal of the type of effect the activity would have on the affected environment. The description includes how and what is being affected, whether it is positive or negative, as well as whether it is direct or indirect.</p>

	<p>Each impact will be assessed and quantified and management objectives according to the first two steps, will be set. The management of the objective will be aligned with the significance of the impact, as well as to ensure a positive outcome. The outcomes will be aligned with standards on environmental management and rehabilitation of mining areas according to the Department of Mineral Resources.</p>
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Description of the Planned Prospecting Methods to be implemented

1) Description of Planned Non-Invasive Activities

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

Phase 1

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 or Kimberlites.

A site investigation of the target areas will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed.

2) Description of Planned Invasive Activities

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

Phase 2

Invasive Prospecting Trenches

Invasive prospecting trenches will be positioned in the region of the blue blocks and each block represents 5 trenches as indicated in Fig. 3.

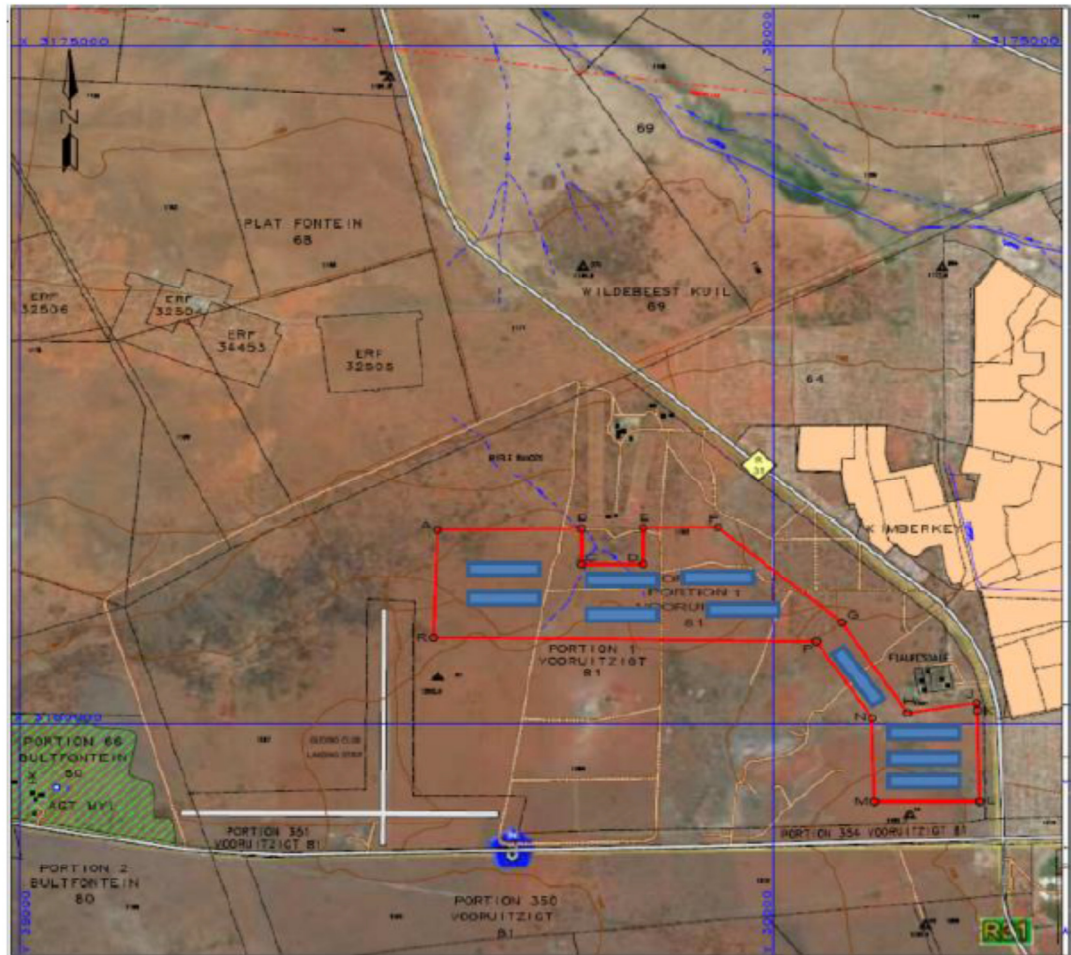


Figure 3: Each blue block represents five trenches, this is not on scale

Trenches Sampling

Discussed hereinafter in Section 3.

3) Description of Pre-feasibility Studies

(Activities in this section includes but are not limited to: initial, geological modelling, resource determination, possible future funding models, etc.)

Phase 3

Analytical Desktop Study

The project Geologist monitors the programme, consolidates and processes the data and amends the programme depending on the results. This is a continuous process throughout the programme and continues even when no prospecting is done on the ground.

Each physical phase of prospecting is followed by desktop studies involving interpretation and modelling of all data gathered. These studies will determine the manner in which the work programme is to proceed in terms of activity, quantity, resources, expenditure and duration.

A GIS based database will be constructed captured all exploration data.

4) **Description of Bulk Sampling Activities**

(Bulk sampling is a sampling technique only)

Volumes of the mineral to be tested

50 Trenches will be excavated with the following dimensions that prove to contain gravels. It is estimated that an average 3m of overburden (calcrete and soil) will be removed before accessing the gravel layer (average width 2 – 4m) which is host to the diamonds. The trenches will be 25m x 15m x 0.5 – 7m deep. We calculated the volume of gravel on 2m and if all 50 trenches are going to be excavated an average of 37 500m³ will be tested.

Why will they be tested:

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

Where will they be tested:

All bulk sampling activities will take place on site. Herewith follows a description of the process:-

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 a 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 articulated dump trucks supported by appropriate 60-t and 40-t excavators and a front-end loader.

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

The gravel is loaded with a 60-t excavator into ADT's. Ore is hauled to the screening plant. As an integral part of the bulk sampling processes, backfilling will take place continuously.

The operation is to be conducted using conventional open pit mining equipment:

Earthmoving and ancillary equipment
1 x Excavator

1 x Front-end Loader
2 x Articulated Dump Trucks
1 x Water Truck
1 x 16ft-Rotary Pan
Screen
Utility vehicles and small tools
Diamond recovery unit with Flowsort Machines, Plant, recovery, crushing and screening equipment

Gravels are loaded onto a vibrating grizzly and the +85mm oversize material is discarded back into the open pit (about 25% reduction). The remaining -85mm fraction is loaded into a 16-foot rotary pan with a treatment capacity of 50 tph. A magnetic separator is used to extract some of the heavy banded iron stones. Tracer tests are done regularly to ensure that the pans are operating at the correct density. Approximately 2.5 tonne of concentrate is tapped from the pan every hour and transported in locked containers to the final recovery unit.

The final recovery unit consists of a holding bin, sizing screen, sizing bins and one state of the art Flowsort X-ray recovery unit which recover diamonds from the +2mm to -32mm size fraction. Final sorting of the X-ray concentrate will be done manually.

Rehabilitation will take place continuously and at any stage only one trench will be open.

To whom they will be disposed of:

At an expected grade of 0.5 carats per hundred tonnes, 8 800 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.

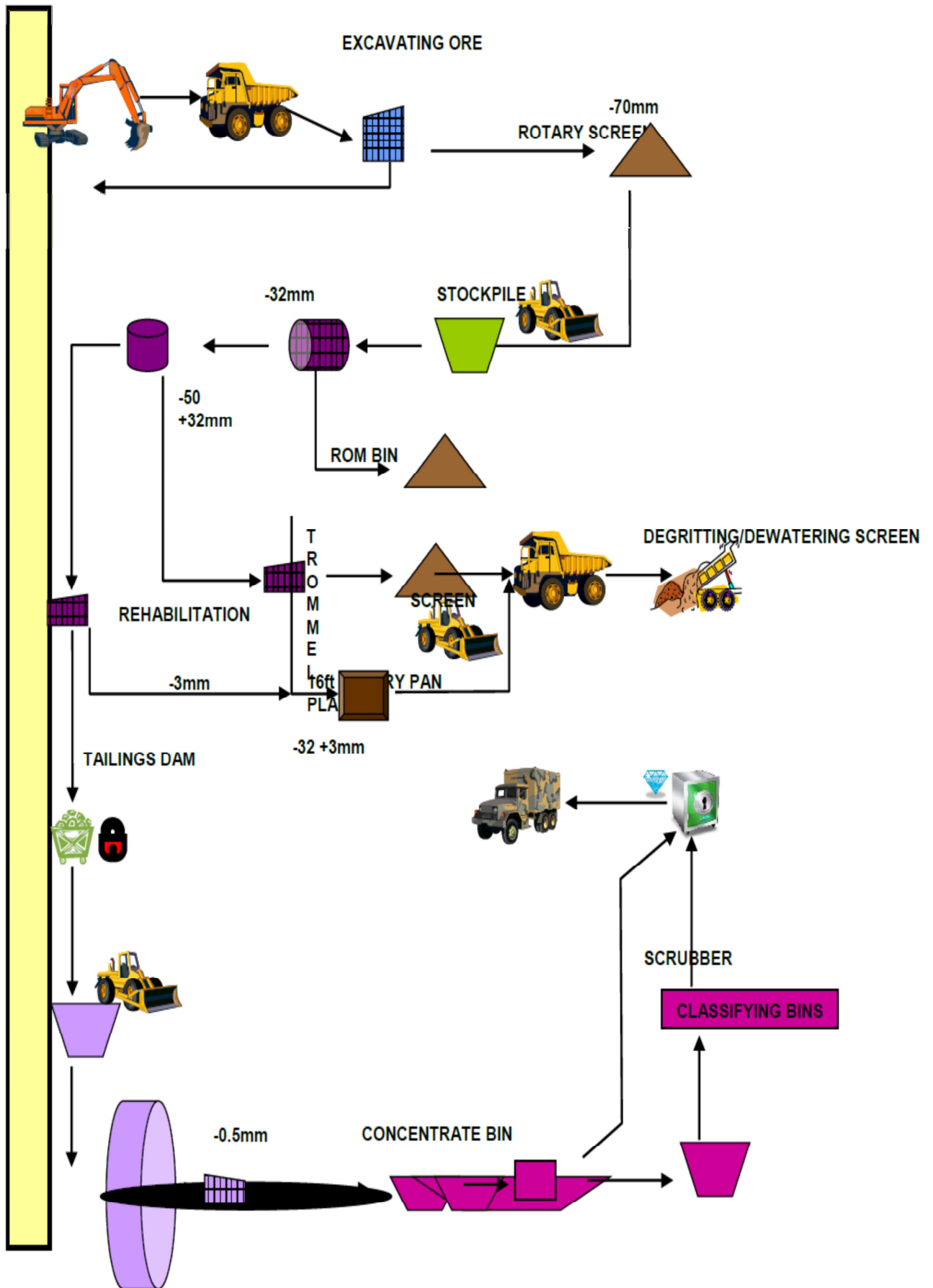


Figure 4: Schematic representation of the planned processing flow

Table 3: Bulk Sampling Activities

ACTIVITY		DETAILS		
Number of pits/trenches planned		50 trenches		
	Number of pits/trenches	Length	Breadth	Depth
	50	25m	15m	0.7m
		18 750m ² = 1.875ha that will be disturbed with trenches (0.7% of the property will be tested and disturbed)		
Locality		See figure 1		
Volume Overburden (Waste)		43 706.25		
Volume Ore		37 500 (estimated 2m gravel)		
Density Overburden		1.6		
Density Ore		1.78		
Phase when bulk sampling will be required		Phase 3		
Timeframe(s)		From time-to-time during months 7 to 30		

e) **Policy and Legislative Context**

Table 4: Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
(A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process)		(e.g. In terms of the National Water Act a Water Use Licence has/has not been applied for)
Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	A Prospecting Right application	A Prospecting Right has been applied for and has been accepted.
Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	A Prospecting Right and Environmental Authorisation	In the process
National Environmental Management Act, 1998 (Act 107 of 1998) NEMA	Section 28 of the National Environmental Management Act, Act No. 107 of 1998 requires duty of care where reasonable measures are taken to prevent pollution or degradation from occurring, continuing or recurring, or, where this is not possible, to minimise and rectify pollution or degradation of the environment. Section 29 addresses the protection of workers refusing to do environmentally hazardous work. Section 30 addresses procedures to be followed in the event of an emergency incident which may impact on the environment. Access to environmental information and protection of whistle blowers are addressed in Section 31.	In the process

<p>National Environmental Management Act, 1998 (Act 107 of 1998) Environmental Impact Assessment Regulations, 2014 (G38282-2982-985)</p>	<p>GNR 983: 2014 Regulations promulgated in terms of NEMA, Act No. 107 of 1998: GNR 982, 983, 984 and 985 Government Gazette No. 38282, Pretoria, in terms of Chapter 5 of the National Environmental Management Act, Act No. 107 of 1998 (as amended), contain the 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.</p>	<p>In the process</p>
<p>National Environmental Management Act: Biodiversity Act, 2004 (Act 10 of 2004)</p>	<p>The National Environmental Management: Biodiversity Act, Act No. 10 of 2004 provides for the MEC/ Minister to list ecosystems that are threatened and in need of protection (Section 52) and to identify any process or activity in such a listed ecosystem as a threatening process (Section 53). 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. The Act also deals with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty care relating to listed invasive species.</p>	
<p>National Environmental Management Act: Waste Act, 2008 (Act 59 of 2008)</p>	<p>Reforms the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.</p>	
<p>National Water Act, 1998 (Act 36 of 1998)</p>	<p>In terms of the definitions contained in Section 1 of the National Water Act, Act No. 36 of 1998, a “water resource” includes a watercourse, surface water, estuary, or aquifer. “Aquifer” means a geological formation which has structures or textures that hold water or permit appreciable water movement through them. “Watercourse” means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland, lake or dam into which, or from which, water flows; and any collection of water which the Minister may, by notice in the Gazette declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks. Furthermore, in terms of the definitions contained in Section 1 of the National Water Act, waste “includes any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water course in such volume, composition or manner as to cause, or to be reasonably likely to cause, the</p>	<p>In the process</p>

	<p>water resource to be polluted". The Minister of Water and Environmental Affairs is allowed to regulate activities which have a detrimental impact on water resources by declaring them to be controlled activities. No person may undertake a controlled activity unless such person is authorised to do so by or under the Act. Duty of Care to prevent and remedy the effects of pollution to water resources is addressed in Section 19. Section 20 addresses the procedures to be followed, as well as control of emergency incidents which may impact on a water resource.</p> <p>Recognised water uses are addressed in terms of Section 21 and the requirements for registration of water uses are stipulated in Section 26 and Section 34.</p>	
World Heritages Convention Act, 1999 (Act 49 of 1999)		
Environmental Conservation Act, 1989 (Act 73 of 1989)	Section 25 of the Environment Conservation Act, Act No. 73 of 1989, as well as the National Noise Control Regulations GNR 154 dated 10 January 1992, regarding noise, vibration and shock, is applicable.	
Environmental Conservation Amendment Act, 2003 (Act 50 of 2003) G26023		
National Environmental Management Act: Protected Areas Act, 2003 (Act 57 of 2003)		
In terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999)	In terms of the National Heritage Resources Act, Act No. 25 of 1999, any person who intends to undertake "any development or other activity which change the character of a site – exceeding 5 000m ² in extent" and "the construction of a Linear development or barrier exceeding 300m in length" must at the very earliest stages of initiating the development notify the responsible heritage resources authority, viz. the Northern Cape Provincial Heritage Resources Agency (NCPHRA) and/or the South African Heritage Resources Agency (SAHRA), as well as the Northern Cape Department of Sports, Arts and Culture.	
Conservation of Agricultural Resources Act, Act No 43 of 1983	Section 5 of the Conservation of Agricultural Resources Act, Act No. 43 of 1983, prohibits the spreading of weeds and Section 6 and Regulation 15 and 15E of GNR 1048 address the implementation of control measures for alien and invasive plant species. This aspect has been addressed in the Environmental Management Programme. This Act also make provision for the conservation of	

	agricultural land.	
National Forests Act, 1998 (Act No. 84 of 1998)	National Forests Act, Act No. 84 of 1998 and Regulations, Section 7: No person may cut, disturb, damage or destroy any indigenous, living tree in a natural forest, except in terms of a licence issued under Section 7(4) or Section 23; or an exemption from the provisions of this subsection published by the Minister in the Gazette. Sections 12 – 16 deal with protected trees, with the Minister having the power to declare a particular tree, a group of trees, a particular woodland, or trees belonging to a certain species, to be a protected tree, group of trees, woodland or species. In terms of Section 15, no person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.	
Subdivision of Agricultural Land Act, Act 70 of 1970	Control the subdivision, and in connection therewith, the use of agricultural land. It also controls long terms leases over portions of agricultural land. The applicant needs to apply for consent from Department of Agriculture for these leases.	
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 therefore and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.	
Section 8 of the Atmospheric Pollution Prevention Act, Act No. 45 of 1965	Section 8 of the atmospheric Pollution Prevention Act, Act No. 45 of 1965, regulating controlled areas, as well as Section 27, with regard to dust control, is still applicable.	
The Occupational Health and Safety Act, Act No. 85 of 1993 GN R 2281 of 1987 – 10-16.	Environmental Regulations for Workplaces are applicable.	
The Northern Cape Nature Conservation Act, Act No. 9 of 2009 addresses protected species in the Northern Cape and the permit application processes related thereto.	Addresses protected species in the Northern Cape and the permit application processes related thereto.	
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 Heliports. It states that any structure exceeding 45m above ground level, or structures where the top of the structure	

	<p>exceeds 150m above the MEAN ground level, like on top of a hill, the mean ground level considered to be the lowest point in a 3km radius around such structure.</p> <p>Structures lower than 45m, which are considered as a danger or a potential danger to aviation, shall be marked as such when specified. Overhead wires, cables, etc., crossing a river, valley or major roads shall be marked and in addition, their supporting towers marked and lighted if an aeronautical study indicates that it could constitute a hazard to aircraft.</p> <p>The highest structures that would be constructed at the proposed development would be the lighting conductors, which would have a height of 25m.</p>	
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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)

The farm portion over which the application was applied for is currently utilized for limited grazing but is earmarked for development by the council. The applicant has applied in 2013 already to obtain this area by the Council to apply for this area. Only a small portion of the area will be impacted on ($\pm 18750\text{m}^2 = 1.875\text{ha}$ that will be disturbed with Trenches (0.7% of the property will be tested and disturbed) at any given time with bulk sampling which represents the footprints of all the trenching activities on the farm combined) the rest of the areas can proceed normally.

g) Motivation for the overall preferred site, activities and technology alternative

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 prospecting is determined by the geological location of the mineral resource (as discussed in section f).

A Prospecting Right application was lodged to identify the preferred areas on the property. The prospecting will be done with pitting and bulk sampling which will be indicated if there are areas on the property that can be viably mined with grade and quality determined with the bulk samples taken off the property.

Prospecting Site Location

A Prospecting Right application was lodged to identify the preferred areas on the property. The prospecting will be done with pitting and bulk sampling which will be indicated if there are areas on the property that can be viably mined with grade and quality determined with the bulk samples taken off the property.

Prospecting infrastructure will be placed strategic by incorporating prospecting project demands, environmental sensitivities and IAP concerns, as identified during 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 location in terms of the prospecting site location other than the prospecting residue deposits unnecessary.

The prospecting method of pitting and open trenches with continued backfilling is the only economic viable method currently being used by the alluvial diamond fraternity; it is also the only cost effective method. There is no alternative prospecting method.

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 viable option for infield screening activities, but the best viable long terms option is the instalment of fuel tanks within a concrete bund wall. The final location of the fuel storage tanks will be determined based on proximity to prospecting operations.

Water Use

If prospecting proves positive a diamond rotary plant will be established which uses (1 X 16 feet rotary pan). Water use for a 16 feet rotary pan is in the order of 18000 litres per hour. The operation will only work in daytime hours which will constitute about 8 hours per day which will bring water consumption to 144000 litres per day and 720 000 litres per week 2880000 litres per month. Total cubic metres tested will be 81206.25 m³ a 16 feet pan can on capacity work about 65 tons per hour which constitutes about 117m³ per hour this means that if the sampling took place continuously it would take about 694 hours 86 days which is about 3 months. Because bulk sampling trenching will be done and processing will not be done continuously the timeframe of 2 years are proposed in the programme. The 3 months' time should then be extrapolated to 2 years which brings the water consumption to 360 m³ over the two year period of prospecting.

Mine Residue Dam

The locality of the mine residue dam will be selected based on the following considerations, this dam will be very small due to the limited material being processed and the limited water water needed:

- The locality is already disturbed or mined out.
- It is within reach of (1 000m) 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 of dam.

- Top soil from the treatment process will be available for final rehabilitation.

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

h) Full description of the process followed to reach the proposed preferred alternatives within the 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.

A Prospecting Right application was lodged and accepted by the Department of Mineral Resources to be done with bulk sampling whereby the grade and quality will be determined with the bulk samples to be taken off the property.

Volumes of the mineral to be tested

50 Trenches will be excavated with the following dimensions that prove to contain gravels. It is estimated that an average 3m of overburden (calcrete and soil) will be removed before accessing the gravel layer (average width 2 – 4m) which is host to the diamonds. The trenches will be 25m x 15m x 0.5 – 7m deep. We calculated the volume of gravel on 2m and if all 50 trenches are going to be excavated an average of 37 500m³ will be tested.

Why will they be tested?

The gravel will be tested to determine a grade (carats per hundred tonne) and value (US\$ per carat). The closest operations is within Kimberley and next to this farm on Platfontein which necessitates bulk sampling for this project.

Where will they be tested?

All bulk sampling activities will take place on site. Herewith follows a description of the process:-

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 a 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 articulated dump trucks supported by appropriate 60-t and 40-t excavators and a front-end loader.

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

The gravel is loaded with a 60-t excavator into ADT's. Ore is hauled to the screening plant. As an integral part of the bulk sampling processes, backfilling will take place continuously.

The operation is to be conducted using conventional open pit mining equipment:

Earthmoving and ancillary equipment

1 x Excavator

1 x Front-end Loader

2 x Articulated Dump Trucks

1 x Water Truck

1 x 16ft-Rotary Pan

Screen

Utility vehicles and small tools

Diamond recovery unit with Flowsort Machines, Plant, recovery, crushing and screening equipment

Gravels are loaded onto a vibrating grizzly and the +85mm oversize material is discarded back into the open pit (about 25% reduction). The remaining -85mm fraction is loaded into a 16-foot rotary pan with a treatment capacity of 50 tph. A magnetic separator is used to extract some of the heavy banded iron stones. Tracer tests are done regularly to ensure that the pans are operating at the correct density. Approximately 2.5 tonne of concentrate is tapped from the pan every hour and transported in locked containers to the final recovery unit.

The final recovery unit consists of a holding bin, sizing screen, sizing bins and one stage of the art Flowsort X-ray recovery unit which recover diamonds from the +2mm to -32mm size fraction. Final sorting of the X-ray concentrate will be done manually.

Rehabilitation will take place continuously and at any stage only one trench will be open.

To whom they will be disposed of:

At an expected grade of 0.5 carats per hundred tonnes, 8 800 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.

i) Details of the development footprint alternatives considered

With reference to the site plan provided as Appendix 3 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.

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed

development enables sustainable development, a number of feasible options must be explored. The various alternatives were assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality the prospecting operation do not form part of the discussion as the location of the mine is determined by the geological location of the mineral resource (as discussed in section f).

Land Use

No specialist comparative land use assessments were conducted, but the prospecting area has low agricultural potential and is earmarked by the Council for development.

It would however be feasible to determine if there is any economically viable minerals to mine before development takes place as mining and development cannot be done simultaneously.

The prospectors will have to promote rehabilitation strategies to ensure that open pits are backfilled. There will be infield screening to ensure that all oversize material is deposited back into the pits. This material should be covered with the overburden (where available), and topsoil that has been previously put aside for this purpose. The post-mining land use should be determined so that the developments strategies of the farm can still be continue beyond the prospecting and mining of the area should the area be viable for mining.

Project Infrastructure

Alternatives and considerations pertaining to the project infrastructure were discussed in section g.

Prospecting Method

The Prospecting method of open pits with continued backfilling is the only economic viable method currently being used by the diamond fraternity. There is no alternative prospecting method for the prospecting of diamonds.

Proceed without the Mine (no go)

Land Use

The current land use is limited grazing and plans for the development of the area by the council. If the prospecting operation does not continue, the limited grazing capacity and plans for development will continue. The most significant activity associated with mining is the provision of water. This could have a potential impact on the existing surface water features and ground water resource. Municipal water will be obtained for bulk sampling. The mining operation will not abstract any ground water. Cumulative impacts associated to grazing include overgrazing, with a potential desertification.

Socio-Economy

The Mystic Pearl prospecting plan is to employ 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.

Furthermore, the prospecting operation's commitment to invest in Human Resource Development, Infrastructure Development Projects, Sustainable Local Economic Development and Small and Medium Enterprises will be lost.

Biodiversity

The implementation of the Mystic Pearl mine will have a potential impact on the biodiversity through removal of indigenous vegetation and destruction of habitats. If no prospecting activities were to continue, the status quo would apply and no damage would accrue to the environment.

Heritage and Cultural Resources

In the event that the prospecting operation does not proceed, the heritage resources will remain as is. The protection and preservation of these resources are therefore not guaranteed. However, if the prospecting operation is approved, the heritage resources will be protected through the demarcation of no-go zones and fencing off of graves if any of these resources are encountered.

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.

The consultation process with interested and affected parties (neighbouring farmers and land owners) was completed.

The process as described by NEMA for Environmental Authorisation was followed. See table below for the identification of Interested and Affected Parties to be consulted with. A copy of a background document which covers the activities from the relevant Prospecting Work Programme ("PWP") with a cover letter was sent by registered mail to all listed parties below. Notice fliers were also put in all post boxes surrounding the area. A notice was also put up at the gate of the area and the Community SAP station as well as the library.

A notice was published on 29 February 2016 for a public meeting in the DFA at the Housing Support Centre Galeshewe (cnr of Moshoeshoe and John Daka Streets) on 15 March 2016 @ 11.

The meeting was attended by:
 Frank Crossley of Mystic Pearl 157 Pty Ltd
 Thabo Hendricks
 Solomon Bennett (0742854522)
 Hester Geyer (0836437179)
 Freddy Long (0836937179)

iii) **Summary of issues raised by I&APs**

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

Table 5: Summary of issued raised by 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
AFFECTED PARTIES					
Landowner/s	X				
Sol Plaatjie Municipality	X	2 Feb 2016 registered letter send to Municipality. Circulation letter dated 04 July 2013	No issues raised, municipality gave a letter in which they circulated the application from Mystic to all the relevant departments.	No response necessary	
Lawful occupier/s of the land					
There are no lawful occupiers.					
Landowners or lawful occupiers on adjacent properties		X			
Mr P.A. Els (neighbour)	X	No comments received up to date			
Mr Frans Louw (neighbour)	X	No comments received up to date			
Mr A.J. Steenkamp (neighbour)	X	No comments received up to date			
Kimcrush (Pty) Ltd (neighbour)	X	01 March 2016	There is a valid prospecting permit registered on the property. A substantial investment of R65 million has already been invested in prospecting activities. We are employing more than 100 people on the operation. The nature of the prospecting operation prevents other activities like blasting and earthmoving.	We have placed on record that the area of Kimcrush does not overlap the application area of Mystic Pearl. A surveyor was instructed to survey the areas and a map was created which clearly shows that the areas does not overlap.	Section I (ii)
Municipal Councillor		X			
Municipality		X			
Frances Baard District Municipality	X	No comments Received up to date			
Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA					

SANRAL	X	No comments received up to date			
ESKOM Holdings SOC Limited Northern Cape Operating Unit: Land Development	X	No comments received up to date			
Dept. of Agriculture, Forestry and Fisheries: Directorate: Forestry Management	X	26 Feb 2016	<p>The report stated that initial prospecting activities will be non-invasive and restricted to a desktop study and that subsequent phases will be of the non-invasive type. According to page 13 of the report, the area to be impacted on is about 253 ha, but no indication was given of the affected vegetation types and their threat status. The report stated that decommissioning will only commence once all prospecting is completed. What is the planned duration of the prospecting phase?</p> <p>Protected trees should be avoided as far as possible during invasive prospecting activities. Placement of small access roads and or any other associated infrastructure such as office area and storage areas should avoid slow-growing protected trees as far as possible. Areas with high density protected trees should be regarded as "sensitive" it should be mapped and avoided as far as possible. If protected trees cannot be avoided, a licence must be applied for and obtained prior to disturbance of such species.</p> <p>Please do a search and rescue of plants of special concern (i.e. endemic species; provincially protected or specially protected species; CITES listed species and TOPS listed species) prior to disturbance of natural vegetation. Succulents such as Aloe species should be rescued and transplanted after obtaining the necessary Flora Permit from the Provincial Department of Environment and</p>	Not mandated yet for response to send out botanist and get specialist flora report to make sure all comments are adequately covered.	<p>vii) Positive and negative impacts of proposed activity and alternatives</p> <p>viii) Possible mitigation measures that could be applied under Indigenous Vegetation</p> <p>i) summary of Key findings of the EIA</p> <p>Impacts to be mitigated in their respective phases Maintenance and Aftercare</p> <p>d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objective</p> <p>Mechanisms for monitoring compliance with and performance assessment.</p>

			Nature Conservation (DENC). The developer may also need a Flora Permit from the DENC for destruction of natural indigenous, protected or specially protected plant species under the Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA). The same applies to TOPS or CITES listed plant species under the NEMBA.		
Department of Water and Sanitation		22 Feb 2016	Distance of the water course Storm Water Management Invasive Alien Vegetation Design and layout of Prospecting Activities Construction Waste Management Rehabilitation Water use entitlement	Will be addressed in WULA application which will be submitted shortly.	m) Proposed impact management objectives and the impact management outcomes for inclusion in the EMP ii) Volumes and rates for water use required for operation iii) Volumes and rates of water use required for operation iii) WULA application
Communities					
No Communities					
Dept. Land Affairs					
Department of Agriculture, Land Reform and Rural Development	X	No comments received yet			
Traditional Leaders					
No Traditional Leaders					
Dept. Environmental Affairs					
Department of Environment and Nature Conservation	X	No Comments received yet.			
Other Competent Authorities affected					
OTHER AFFECTED PARTIES					
None					
INTERESTED PARTIES					
None					

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:

The area surrounding the application area hosts numerous kimberlites and alluvial diamond deposits.

Diamond deposits can be classified as primary (kimberlites and lamproites) and secondary (alluvial and marine). Diamonds are known to occur in a variety of rocks, however the only known economically significant primary sources of diamonds are kimberlite and lamproite. No significantly diamondiferous lamproites are known in South Africa where the primary sources mined are kimberlite pipes and dykes.

Over 800 kimberlite occurrences have been identified in South Africa, but only 50 carry significant quantities of diamonds. Many occurrences are sub-economic due to the low grade or quality of the diamonds or the insufficiency of the size of the ore body.

The Kimberley District of the Northern Cape Province is situated near the western margin of the Kaapvaal craton, which is associated with the occurrence of kimberlitic emplacements. Two distinct types of kimberlite are recognised: Group I, or olivine-rich, monticelliteserpentine-calcite kimberlites and Group II, or micaceous kimberlites. Historically, these were respectively referred to as “basaltic” and “micaceous lamprophyric” kimberlites. These distinctive groups are derived from sources in the earth’s mantle that are either slightly depleted (Group I), or enriched (Group II) with respect to light rare earth elements. This enrichment and depletion is evidence of past metasomatic processes occurring in the mantle.

Kimberlites were emplaced along several parallel north-northeast and east-west trending structures located along the southern, western and northern boundaries of the Kaapvaal Craton. There have been several pulses of kimberlite emplaced into the Kaapvaal Craton. Typically kimberlite intrusions occur in swarms or clusters.

The erosion of diamondiferous kimberlites liberates diamonds onto the land surface, for redistribution by streams and rivers. The processes that lead to the deposition and concentration of diamond in river sediments are obviously of direct importance in the formation of economic alluvial diamond deposits (or diamond placers). It is believed that these diamond deposits continues onto the application area.

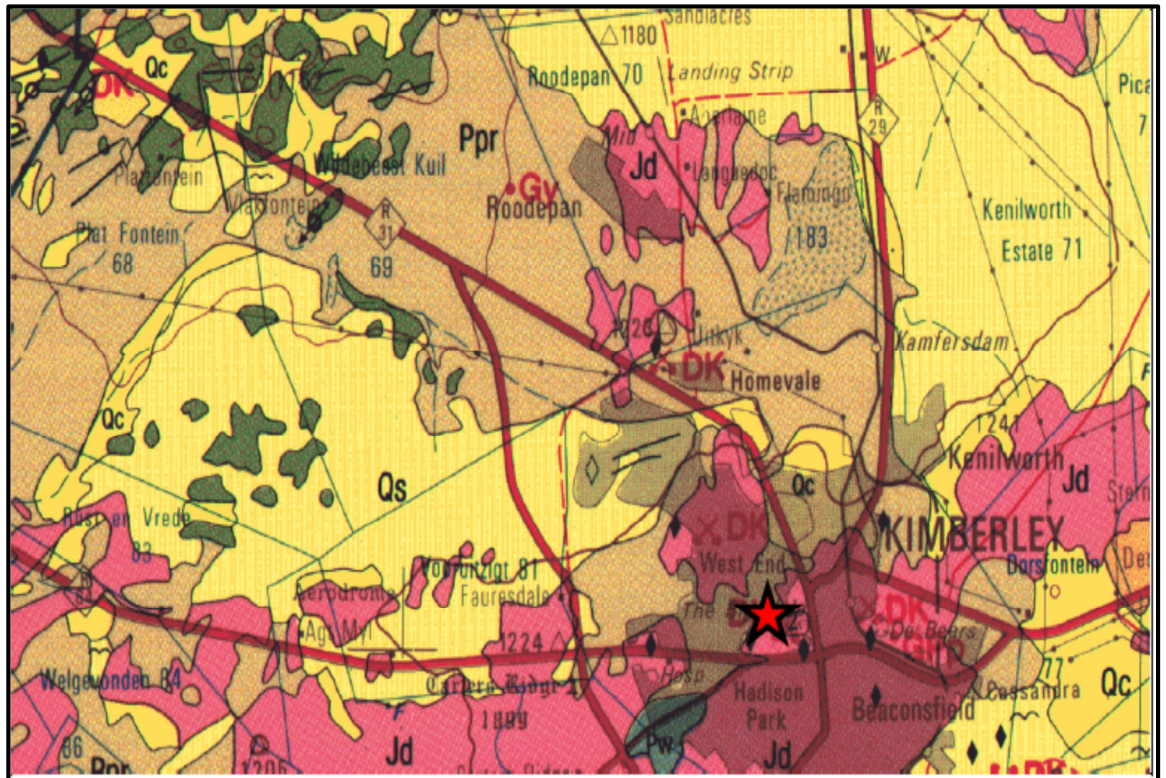


Figure 5: Extract from 1:250 000 geological map 2824 Kimberley (Council for Geoscience, Pretoria) showing location of A Portion of Portion 1 of the farm Vooruitzicht 81, Kimberley district application area indicated with RED star

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

Blue (Vgd) = Campbellrand Subgroup comprises of coarse to fine grained dolomite and limestone, Grey (C-Pd) = Dwyka Group, Yellow (T-Qc) = Neogene calcrete, Pale yellow (Qs) = Quaternary to Recent sands and sandy soil of the Gordonia Formation (Kalahari Group). DK marks Diamond in Kimberlite.

2) Climate:

Regional Climate:-

The Town of Kimberley is located in an arid climatic region and is characterised by relatively low rainfall. In addition, rainfall in the Kimberley area is highly unpredictable, both temporally and spatially. However, precipitation is seasonal with the majority of rain falling between December and February. Conditions can be extreme with temperature ranges between summer and winter. The maximum historical recorded temperature is 40°C, measured in the months of December, January and February. The prevailing wind direction for the region is pre-dominantly north-westerly and the average monthly wind speeds range between 1.1 and 4.8 ms⁻¹.

MEAN MONTHLY AND ANNUAL RAINFALL

As mentioned previously, rainfall in the Kimberley area is highly unpredictable and generally low (average of 415 mm per annum). The mean monthly rainfall and number of days per month with measurable precipitation are indicated in Table 6, below.

Table 6: Minimum, average and maximum monthly rainfall (mm) and average number of days per month with measurable precipitation for the Kimberley area

Month	Minimum	Average	Maximum	Days with rain
January	1	61	213	9.1
February	2	67	190	9.0
March	2	72	222	9.8
April	0	42	160	6.9
May	0	19	74	4.3
June	0	9	105	2.0
July	0	9	58	1.7
August	0	10	120	1.8
September	0	12	145	2.4
October	0	28	172	5.2
November	0	42	144	7.1
December	2	51	214	7.4

Refer to Table 7, below for the monthly precipitation averages for the 30-year period from 1961 – 1990 according to the South African Weather Service.

Table 7: Average monthly precipitation (mm), highest 24 hour rainfall (mm), as well as the average number of days per month with precipitation more than 1 mm for the Kimberley area (1961 –1990)

Month	Average monthly (mm)	Average number of days with > = 1 mm	Highest 24 hour rainfall (mm)
January	57	10	45
February	76	10	88
March	65	10	54
April	49	8	51
May	16	3	55
June	7	3	18
July	7	2	22
August	7	2	26
September	12	3	44
October	30	6	35
November	42	8	60
December	46	8	60
Year	414	71	88

MAXIMUM RAINFALL INTENSITIES

Rainfall in the Kimberley area is derived mainly from thunderstorms and the majority of rainfall events results in less than 30 mm of rain. Recent years (2005 - 2012) have shown increased intensity of some rainfall events. The maximum-

recorded rainfall in 24 hours is 110 mm and per hour is 48mm. Refer also to Table 8 key Climate data for Kimberley, South African Weather Service.

Table 8: Key Climate Data for Kimberley, South African Weather Service (March 2010)

Month	Record High °C	Average High °C	Average Low °C	Record Low °C	Precipitation mm	Average. Precipitation Days
Jan	40	33	18	7	57	10
Feb	40	31	17	6	76	10
Mar	36	29	15	2	65	10
Apr	35	25	11	0	49	8
May	31	21	7	-6	16	3
Jun	27	18	3	-7	7	3
Jul	27	19	3	-8	7	2
Aug	31	21	5	-7	7	2
Sep	36	26	9	-6	12	3
Oct	38	28	12	-1	30	6
Nov	39	30	15	3	42	8
Dec	40	32	17	5	46	8
Year	40	26	11	-8	414	73

Average Maximum and Minimum Temperatures:

The average maximum temperature measured during the Summer is 30.9°C and the minimum during the Winter months is 3.4°C.

Average Monthly Wind Direction and Speed:-

The prevailing wind direction in the area is mainly from the north to north-westerly with the strongest winds from the west-southwest to north-northwest that occurs between August and December. October and November month are common for high wind speeds of up to 4.85 metres per second.

Average Monthly Evaporation:-

It is estimated that the average annual evaporation rate is approximately 2365mm which indicates the dry climate conditions in this area.

Presence of Extreme Climatic Conditions:-

Hail: October to March
 Frost: May to September
 Strong Winds: Occasional strong winds occur but not often
 Droughts: Normal for a dessert area – approximately 6 out of 10 years

3) Topography:

Kimberley is located approximately 1 200m above sea level on a generally flat plain with low gradient slopes. Closer to the prospecting area, the landscape is altered by the presence of man-

made infrastructure like the landing strip, the rifle range and the domestic waste dump.

4) Soil:

The soils encountered in and around Kimberley fall into the following land types:

- Ae15.
- Ae45.
- Fb1.

The Ae15 land type is comprised of topography with an A3 grading. This means that more than 80 % of the land type has a slope less than 8 % and the altitude difference between the highest and the lowest point ranges from 90 – 150 m. The soils are predominantly rocky and shallow on the higher lying areas (mainly dolerite outcrops) and moderately deep to deep in the lower lying areas (mainly derived from wind transported sands). Due to a relatively low rainfall the soils are mainly eutrophic with occasional occurrences of free lime and lime nodules in deeper soil horizons. The soils are not suited to intensive dryland agricultural practices mainly due to climatic constraints (rainfall).

The Ae45 land type is very similar to the Ae15 land type with the difference that the soils are generally shallower with a wider occurrence of lime containing soils in the lower lying areas. The shallow nature of the soils is linked mainly to the dominant geology – tillite, shale and mudstone partially covered by surface limestone and red wind-blown sands.

The Fb1 land type is comprised of topography with an A2 grading. This means that more than 80 % of the land type has a slope less than 8 % and the altitude difference between the highest and the lowest point ranges from 30 – 90 m. This land type is dominated by rock outcrops and rocky areas and with the occasional occurrence of moderately deep to deep soils that range from apedal to structured. Due to a relatively low rainfall the soils are mainly eutrophic with wide spread occurrences of free lime and lime nodules in deeper soil horizons. The soils are not suited to intensive dryland agricultural practices mainly due to climatic constraints (rainfall).

5) Land Use:

The current land use on the property is earmarked for development by the municipality.

6) Fauna:

Fauna species are expected to be present within the vicinity and around the adjacent areas.

Table 9: The following animal species can occur on the area:

English Name	Scientific Name
Aardvark	<i>Orycteropus afer</i>
Black-backed-jackal	<i>Canis mesomelas</i>
Cape Hare	<i>Lepus capensis</i>
Caracal	<i>Felis caracal</i>
Chacma Baboon	<i>Papio ursinus</i>
Common Duiker	<i>Sylvicapra grimmia</i>
Kudu	<i>Tragelaphus strepsiceros</i>
Rock Dassie	<i>Procavia capensis</i>
Scrub Hare	<i>Lepus saxatilis</i>
Steenbok	<i>Raphicerus campestris</i>
Suricate	<i>Suricata suricatta</i>
Vervet Monkey	<i>Cercopithecus aethiops</i>
Aardwolf	<i>Proteles cristatus</i>
Slender Mongoose	<i>Galerella sanguinea</i>
Grey Mongoose	<i>Galerella pulverulenta</i>
Ground Squirrel	<i>Xerus inauris</i>
Small-spotted Genet	<i>Genetta genetta</i>
Porcupine	<i>Hystrix africae australis</i>
Tortoise	<i>Testudinidae geocheilon e.</i>

7) Flora:

The study area is situated in the Central Form of the Kalahari Thornveld (Type 16(a)(3) of the Southern Africa (Acocks 1988).

According to Acocks (1988), the natural vegetation found is a rich flora, with forbs and annuals playing an important part. The cover, however, is sparse: other poisonous plants which may be locally common, include *Geigeria brevifolia*, *G. obtusifolia* and *Urginea sanguinea*.

This vegetation type is commonly dominated by *Acacia tortilis* subsp., *Heteracantha*, *Lycium cinereum*, *Rhus siliate*, *Grewia flava*, *Tarchonanthus camphorates*, *Ziziphus mucronata*, *Acacia Erioloba*, constituent are the following Lehmann's Love Grass (*Eragrostis lehmanniana*), Spreading Three-awn (*Aristida congesta* subsp. *Barbicollis*) *Schmidtia pappophoroides*, *Themeda triandra*, Tassel Three-awn (*Aristida congesta* subsp. *Congesta*) etc.

8) Water:

8.1 *Surface Water*

There are no rivers in close proximity of the proposed prospecting area. It is unlikely that the prospecting operation will negatively affect any surface water. There is a natural drainage channel indicated within the prospecting area. This channel will only receive water when it rains.

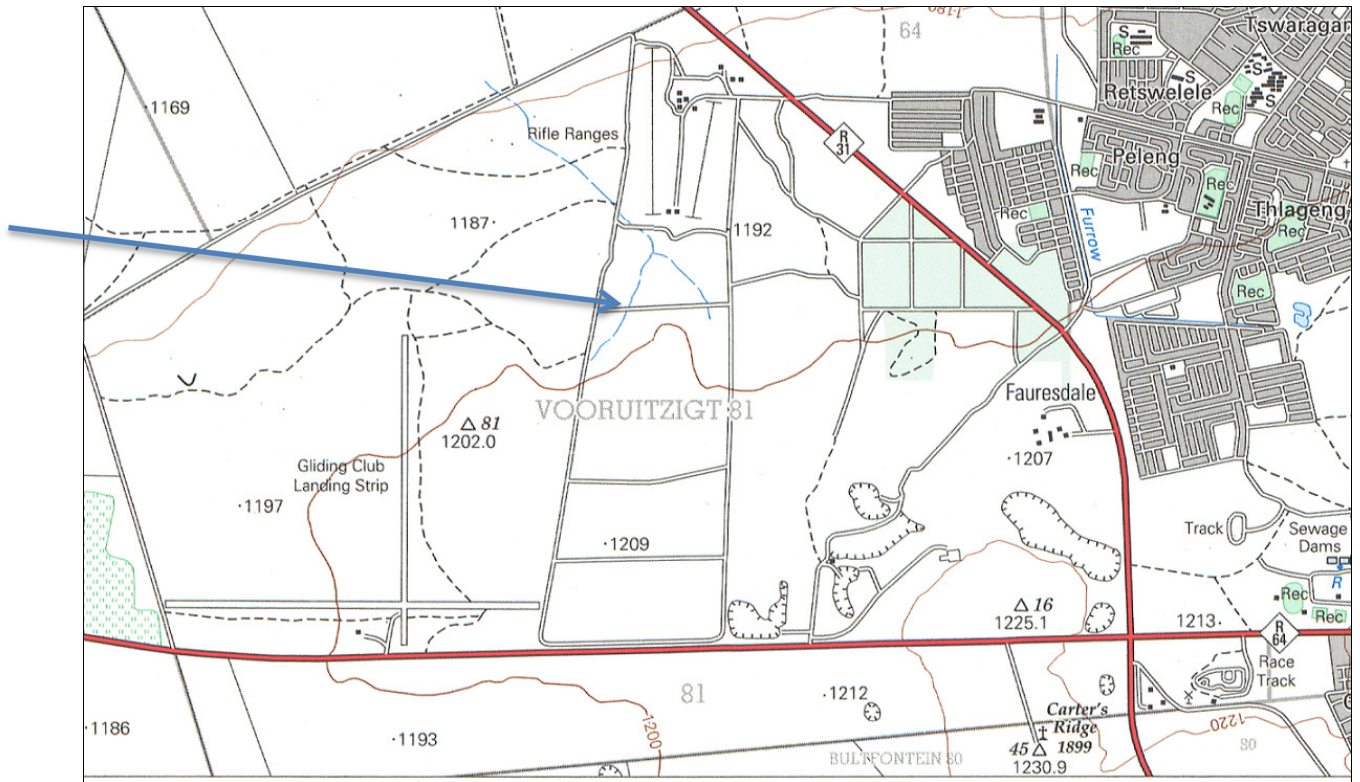


Figure 6: See dry drainage channel indicated in blue which enters the prospecting area.

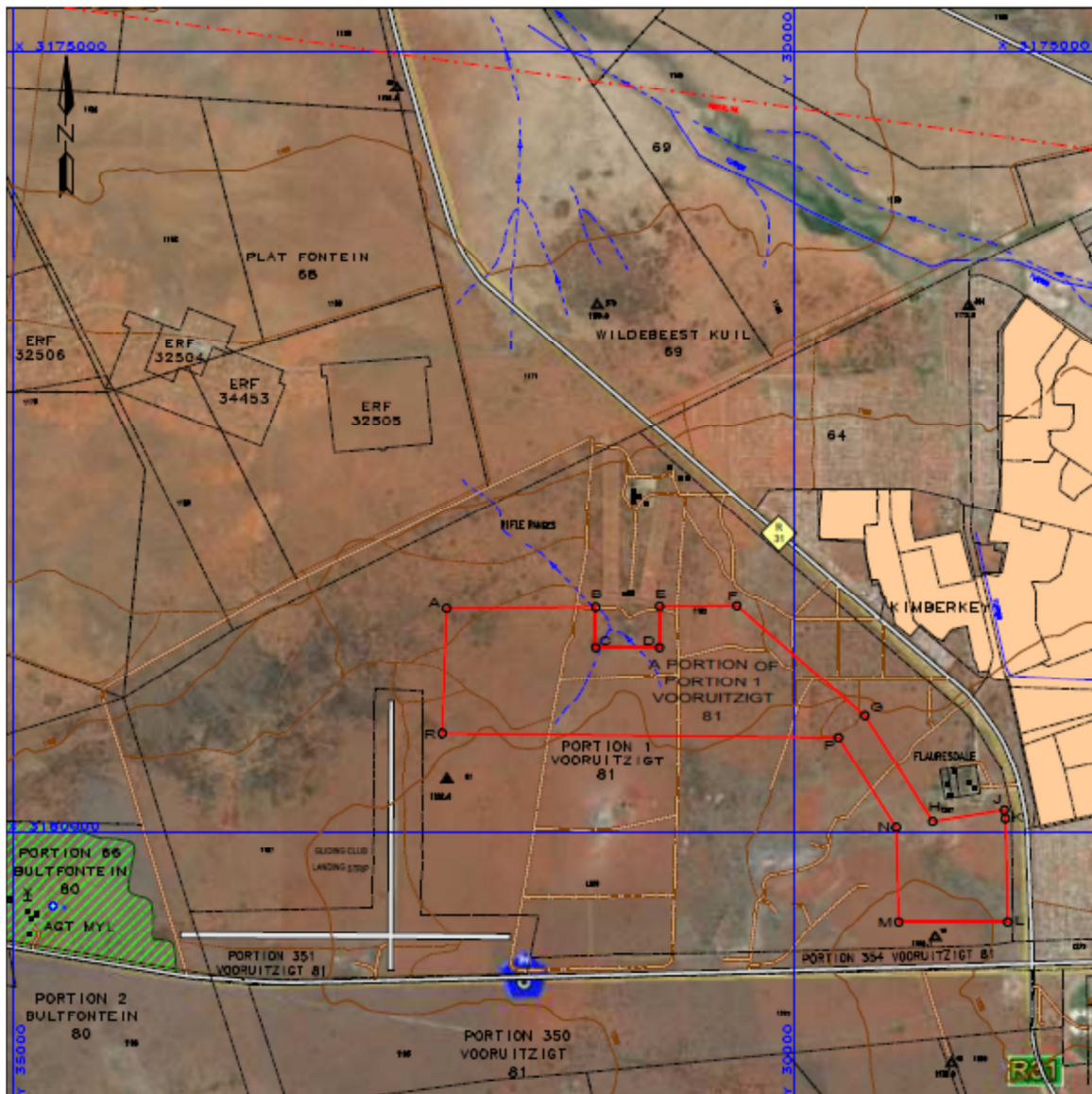


Figure 7: See dry drainage channel

8.2 *Ground Water*

Groundwater flow would follow the topography and the surface drainage direction from the higher area in the east towards the lower area in the west.

9) Air Quality and Noise:

9.1 *Air Quality*

Current sources of impacts on air quality are the dust from unpaved gravel roads. Prospecting activities such as excavation and gravel roads from where the tar road end to the prospecting site will add impact on the environment.

The general air quality on the area is expected to be good.

9.2 Noise

The current sources of noise are from the tar roads towards Kimberley, the normal day to day noises from the town of Kimberley.

Noise is normally encountered during the normal operation hours at the processing plant. Processing plant noise and mine vehicles are limited between 7am and 4pm every day during the week. Noise levels are monitored on the mining area and where necessary, protective equipment is used in certain areas where machinery is used.

10) Areas of Cultural-historical or Archaeological Interest:

There are no known graves on the property or any other heritage resources. An Archaeologist has been instructed to do a heritage report but this has not been finalized yet.

11) Sensitive Landscapes:

“Sensitive environments” that have statutory protection are the following:

1. Limited development areas (Section 23 of the Environment 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.

12) Visual Impacts:

12.1 *Visibility of the mine from existing roads*

The prospecting area will only be visible from the rifle range and from the landing strip and the dirt roads leading to these areas.

12.2 Visibility of the mine from residential areas

There are some residential areas within the surrounding area, Fauresdale and Peleng would be able to see the operation in a distance.

13) Socio-economic Structure of the Region:

(a) *Population density, growth and location*

According to the 2011 Census, the population of Kimberley was 96,977, while the townships Galeshewe and Roodepan had populations of 107,920 and 20,263 respectively. This gives the urban area a total population of 225,160. Of this population, 63.1% identified themselves as “Black African”, 26.8% as “Coloured”, 8.0% as “White” and 1.2% as “Indian or Asian”. 43.2% of the population spoke Afrikaans as their first language, 35.8% spoke Setswana, 8.7% spoke English, 6.0% spoke isiXhosa and 2.7% spoke Sesotho.

Kimberley is the capital of the Northern Cape Province. It is located approximately 110km east of the confluence of the Vaal and Orange Rivers. The city has considerable historical significance due to its diamond mining past.

The Sol Plaatjie Local Municipality comprises of a large urban node in the form of Kimberley, and villages and farms. Kimberley is the administrative centre of the municipality. The economic activities consist of retailers, industries as well as mining and farming.

The SPLM accommodates approximately 247 000 people and is also a major contributor to the economy of the Province accounting for 28.9% and 82.1% of provincial and District GDP in 2009 respectively, Sol Plaatjie LM certainly is encumbered with ensuring that the Province as a whole reaches its accelerated growth objectives.

Table 10: Sol Plaatjie Municipality: Population by Population Group

Persons	2001	1996	Change over 5 years		Annual ave % change	% Composition 2001
			Number	percent		
African	109,714	105,838	3,876	4%	0.7%	54%
Coloured	63,918	63,655	263	0%	0.1%	32%
Indian	1,612	1,809	-197	-11%	-2.3%	1%
White	26,220	29,587	-3,367	-11%	-2.4%	13%
Total Population	201,484	204,263	-2,799	-1%	-0.3%	100%

Table 11: Gender

Gender	People	Percentage
Female	49 550	51.09%
Male	47 427	48.91%

Table 12 : Population Group

Population Group	People	Percentage
Black African	40 218	41.47%
Coloured	35 590	36.70%
White	17 841	18.40%
Indian or Asian	2 226	2.30%
Other	1 102	1.14%

Table 13 : Language

First Language	People	Percentage
Afrikaans	52 161	55.48%
Setswana	17 621	18.74%
English	14 626	15.56%
isiXhosa	4 328	4.60%
Sesotho	2 174	2.31%
isiZulu	901	0.96%
Other	836	0.89%
isiNdebele	418	0.44%
Sign Language	301	0.32%
Sepedi	275	0.29%
Tshivenda	175	0.19%
Xitsonga	153	0.16%
SiSwati	57	0.06%
Not Applicable	2 952	

(b) Major Economic Activities and Sources of Employment:-

The population of Sol Plaatjie shows a declining trend – in common with the Northern Cape Province as a whole. One third of the employed citizens in Sol Plaatjie work for the public sector. The number of economically active people barely grew between 1996 and 2001. However, the number of people with employment

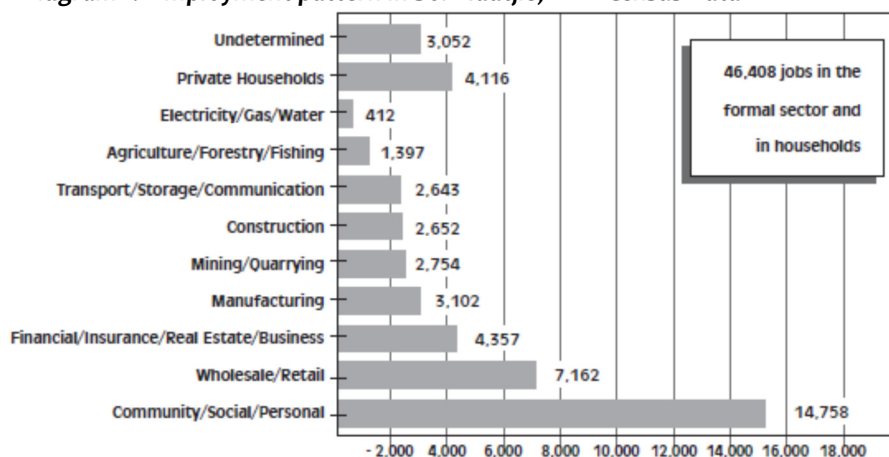
decreased, with the result that the rate of unemployment increased markedly, from 34% to 42%.

Table 14: Employment

Persons	2001	1996	2001	1996	Change over 5 years	
			Percent	Percent	Number	Percent
Employed	46,412	51,643	58.5%	65.7%	-5,231	-10%
Unemployed	32,928	26,979	41.5%	34.3%	5,949	22%
Total Labour Force	79,340	78,622	100.0%	100.0%	718	1%
Not Economically Active	54,218	49,889			4,329	9%
Population 15 – 65	133,558	128,511			5,047	4%
Total Population	201,484	204,263			-2,799	-1%

In the past, the local economy of Sol Plaatjie was heavily dependent on the De Beers Diamond Mines in and near SPM. In addition, the military maintained large bases of men and equipment in and around the region. However, since the major mines, have downscaled and closed over the last 15 years and the military establishments have shrunk since 1994, the local economy has changed without diversifying. The public sector is the single largest source of employment, as the city is home to the regional and head offices of three spheres of government. The figure below illustrates that in 2001 the majority of the population were employed in the service sector.

Diagram 1: Employment pattern in Sol Plaatjie, 2001 Census Data



Other major employment areas are retail distribution and services. Tourism is a useful contributor to the economy, but it is not large enough to be defined as a driver of the economy in its own right. Employment in the manufacturing sector has experienced slow decline between 2000 and 2003.

Since the manufacturing sector is slowly losing the limited critical mass that it had, it no longer provides a viable economic sector for SPM on which to focus over the longer term within the ambit of a

city development strategy. With regard to other economic sectors, the following picture emerges:

- Mining is in closure mode within the city;
- Construction depends on government decisions;
- Retail is a driver of the local economy as the trading centre for the region;
- Tourism is a supporter of economic growth, but will rely on improved human capital;
- Transport depends on major state infrastructural investment in road and rail upgrading.

Table 15: Positive and negative forces in the economy

	Positive	Negative
Main Forces	Drivers of the economy Government (Provincial, District & Local) Retail and service economy for the city and the region	Underminers of the economy Decline of the mining and manufacturing sectors Growing strength of Mangaung as the principal urban centre in the region
Important Supplements	Boosters The Diamond Hub Project The Urban Renewal Projects	Obstacles / Barriers Deteriorating state of the N12
	Complementers Tourism and tourism development Blue Train Appropriate improvers of the retail and recreation environment	Caps Capacity of the SPM as an institution to drive the strategic agenda Poor state of maintenance on municipal services Infrastructure supporting economic activity Loss of municipal tax revenue through decline of CBD
	Supporters De Beers "Big Hole" redevelopment – conference centre, hotel, museum Education institutions	Diversions Decentralised shopping malls
	Sustainers The N23 in its present poor state	
	Defenders Social grants	
Alternatives	Rescuers The new prison and mental facility Regional health facilities The N12 upgraded The military Relocation of a national department to Sol Plaatjie	

(c) Estimated Unemployment:-

The education level of persons in the area where only 10% have post-matric and 90% matric or less with an unemployment rate of 33% which is mainly in the category of persons with matric or less, a need exist for innovative ways to diversify the economy. The main

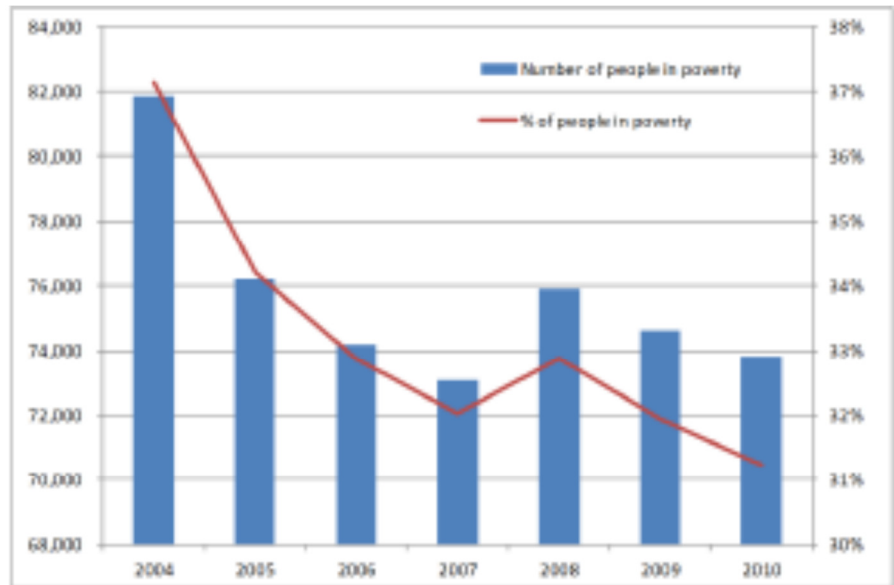
job creating sectors are the primary and secondary sectors which employ the most unskilled workers.

Table 16: Labour Market and Education Statistics 2011 compared to 2001

Labour Market				Education (aged 20+)					
Unemployment Rate (official)		Youth Unemployment Rate (official) 15 – 34 years		No Schooling		Matric		Higher Education	
2001	2011	2001	2011	2001	2011	2001	2011	2001	2011
41,3%	31,9%	51,5%	41,7%	11,3%	7,1%	21,9%	29,2%	8,7%	10,4%

Linked to the unemployment rate the chart below indicates the people living in poverty in the Sol Plaatjie Municipality.

Chart 1: Number and percentage of people living in poverty, Sol Plaatjie Local Municipality 2004 – 2010



According to the chart above the number of people living in poverty decreased dramatically to 31,2%. This is well below the national average of 39,9% as well as the provincial and district averages of 43,4% and 39,1% respectively. The NDP's target is to reduce the number of people living in poverty to 39% by 2030.

(d) Housing Demand and Availability:-

Table 17: Access to Household Services (higher level) 2011 compared to 2001

Level of Service	2001 %	2011 %
Piped water inside dwelling	51,2	61,9

Flush toilet connected to sewer	83,4	82,8
Electricity for lighting	82,4	84,9
Weekly refuse removal	90,8	84,3

SPM was able to provide more households with a higher standard of service in terms of water and electricity during the period 2001 to 2011 which was however not the case with sanitation and refuse removal. In the case of sanitation the main reason is that until 2009/10 SPM's bulk sewer treatment works ran out of capacity which led to a moratorium on development as new development – also housing development – could not be connected to the sewer network. The capacity problems have since been resolved and the moratorium has been lifted and enough capacity has been created for the next 20 years. Refuse removal also lagged behind mainly due to the increase of informal settlements – which is not accessible to deliver a waste removal service. This is still the case today.

The infrastructure diamond below depicts the four household infrastructure measures on a single diamond shaped chart. The larger the diamond, the better serviced the area is in terms of refuse removal, electricity, water and sanitation access. The dotted blue line shows the national average as a means of comparison, the light dotted blue line is the provincial comparison, whilst the green line shows the SPM's measure. The dotted blue line falls inside the green line indicating that SPM is performing better than the national and provincial average.

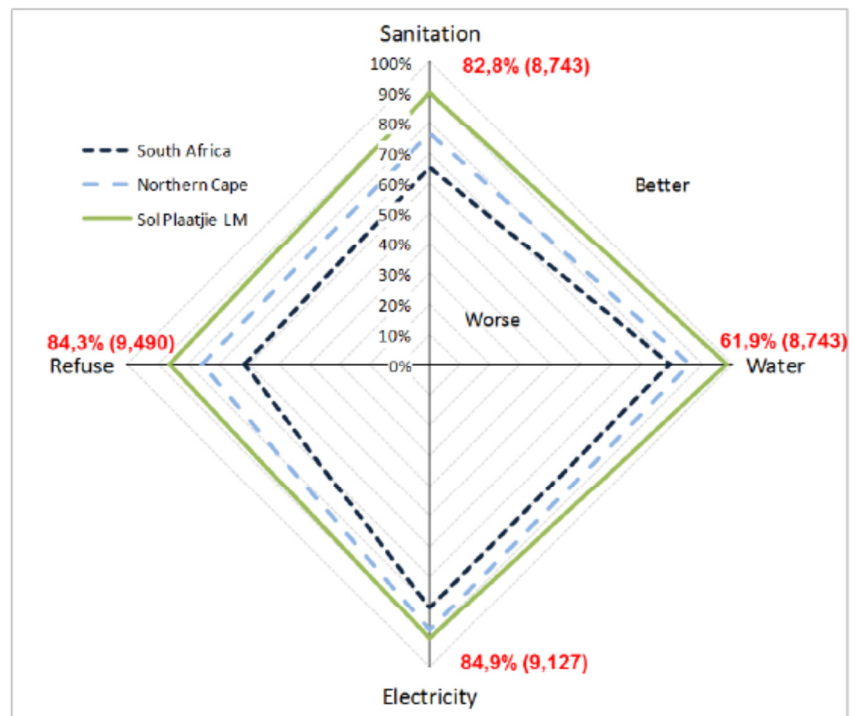


Figure 8: SPM Infrastructure Diamond: Basic Services: 2011

Although SPM does well in providing services to its communities the tables below indicate the backlogs and needs that still exist in terms of service delivery.

The table below indicate the number of informal settlements in SPM as well as the stage of development in each informal settlement.

Table 18: No. and Status of Informal Settlements

Description	No. of Areas	H/H
Planning not commenced	9	5 172
Planning in process	11	2 167
Planning completed – await registration	5	1 526
Install services	2	996
Housing	1	3 500
TOTAL	28	13 361

Table 19 below indicates the present backlogs/need for basic household services according to Census 2011, the provision of services since the 2012/2013 financial year as well as the planned provision for the financial year 2014/2015. It also include the growth of informal households since the 2011 Census and the survey done through the NUSP process.

Table 19: Basic Household Services Backlog and Need 2011

Service	Backlog Census 2011	Provision up to 30 Jun 2014	2014/2015 Targets	TOTAL	Balance	PLUS Growth 2011 to 2013
New Houses (subsidised)	7 846	1 293	375	1 668	6 178	11 693
New Erven Planned and Surveyed	7 846	1 163	1 272	2 435	5 411	10 927
Houses connected to water	8 743	2 521	892	3 413	5 330	10 846
Houses connected to sanitation	9 343	3 552	892	4 444	4 899	10 415
Houses connected to electricity	9 127	2 335	214	2 549	6 578	12 094
Houses provided with waste removal	9 490	2 000	600	2 600	6 890	12 406
Roads Rehabilitation/ Paving	297km	25,7km	2,5km	31,7km	265,3km	-

(e) Social Infrastructure:-

The city of Kimberley have formal infrastructure such as schools, university, hospitals, sport- and recreation facilities and shops.

(f) Water Supply:-

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 water on-site or in yards, which is available to around 33% of the population.

Surface water from the Riet-, Vaal- and Orange River is the major source of water in the region, although some smaller communities are totally dependent on groundwater for supply.

(b) Description of the current land uses

The current land use on this property is for municipal development, the soil on the property does not provide for any other land use on the property or alternative uses.

If the prospecting operation proves positive the only other use in this area will be for mining.

(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)

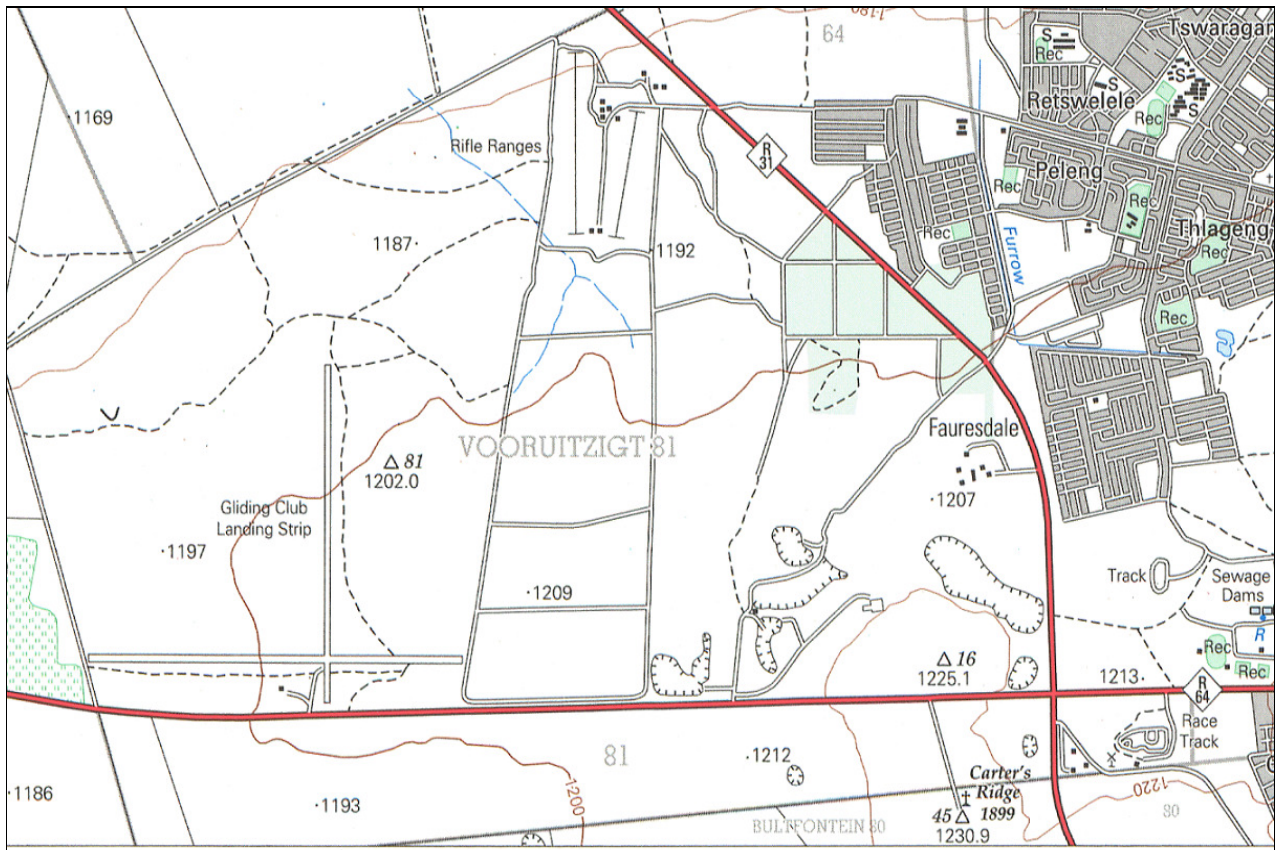


Figure 9: Environmental and current land use map

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 12: 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 and placement of	Low to medium	Certain	Post-closure	Moderate	Backfill all excavations continuously and employ effective rehabilitation strategies to restore surface

	infrastructure and development of mine residue deposits.					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 value; potential loss of ecosystem function.	Low to medium	Certain	Life of operation	Major	Prevention of overspill of mine associated activities onto the surrounding ecological 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	Low to medium	Certain	Residual	Critical	Prevention of overspill of mine associated activities onto

	habitats; potential loss of ecosystem function.					the surrounding ecological environment. Employ proper protection and rehabilitation strategies.
Air quality	Sources of atmospheric emission associated with the prospecting 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 disruption of sensitive receptors by means of increased noise and vibration.	Low	Certain	Decommissioning	Minimal	Minimise the generation of excessive noise and vibration; Ensure all vehicles and equipment is in a good working order; proper communication.
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	Low	Low likelihood	Decommissioning	Minimal	Utilise existing access roads, where applicable; implement measures that ensure adherence to

	networks.					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 prospecting 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 impact of employment loss during mine closure.	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.
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.

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:

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

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)

During construction and operation of the prospecting operation, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and slimes dam will alter the topography by adding features to the landscape. Topsoil removal and excavations will unearth the natural topography. The construction of infrastructure and various facilities in the mining area can also result in loss of soil due to erosion. Vegetation will be stripped in preparation for placement of infrastructure and excavations, and therefore the areas will be bare and susceptible to erosion. Protected trees should be avoided as far as possible during invasive prospecting activities. Placement of small access roads and or any other associated infrastructure such as office area and storage areas should avoid slow-growing protected trees as far as possible. Areas with high density protected trees should be regarded as “sensitive” it should be mapped and avoided as far as possible. If protected trees cannot be avoided, a licence must be applied for and obtained prior to disturbance of such species.

A search and rescue of plants of special concern (i.e. endemic species; provincially protected or specially protected species; CITES listed species and TOPS listed species) prior to disturbance of natural vegetation will be done. Succulents such as Aloe species should be rescued and transplanted after obtaining the necessary Flora Permit from the Provincial Department of Environment and Nature Conservation (DENC).

The developer may also need a Flora Permit from the DENC for destruction of natural indigenous, protected or specially protected plant species under the Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA). The same applies to TOPS or CITES listed plant species under the NEMBA. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The declared areas will be rehabilitation, but full restoration of soil might only occur over a number of years, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

During the construction and operation of the prospecting there is a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil unusual unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for grazing, but grazing activities can still be performed in areas not earmarked for mining, and with proper rehabilitation the land capabilities and land use potential can be restored.

If oil and fuel spillages occur, then it will seep into the underlying aquifers and contaminate ground water. Improper handling of hazardous material will cause contamination of nearby surface water resourced during runoff episodes. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow.

Construction and mining activities on site will reduce the natural habitat for ecological systems to continue their operation. It is not expected that the areas of high ecological function will rehabilitation following disturbance events. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species. It is expected that protected species will be destroyed during the prospecting operation.

While general clearing of the area and prospecting activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plant establish in disturbed areas, it may cause an impact beyond the boundaries of the mining site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

The transformation of natural habitats to mining and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to mining activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. The construction of the mine and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the site. Pockets of fragmental natural habitats hinder the growth and development of populations.

During the prospecting operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific

operations. The prospecting will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by prospecting activities are low.

The impact of site generated trips on the traffic of the existing roads is experienced to be low. Nevertheless, if road safety is not administered it can have a high impact on the safety of fellow road users.

The prospecting operation, especially during construction, will create a limited number of new employment opportunities. The magnitude of this impact will depend on the number of people that will be employed and the number of contractors sourced. An influx of people into the rural area will possibly impact on safety and security of local residents. During the decommissioning and at closure of the prospecting, staff will most likely be retrenched. This can potentially flood the job market, resulting in people being unable to find new employment for a long period of time. It is normally more difficult for people with highly specialised skills to find employment immediately. Those with fewer skills have more flexibility in the job market.

Economic slump of the local towns after mine closure is an associated potential impact although this will only be a prospecting operation. Income streams from wage bills as well as goods and services contracts (at all geographical levels) will come to an end, reducing the monetary income of individuals and mine-related businesses. People who have derived income directly or indirectly from the project may be inclined to leave the region in search of employment or business opportunities. This could result in further decline of the economy of the region as well as the abandonment of infrastructure. The loss of the mine workforce income will also impact upon non-mine related industries within the local and regional areas, particularly the rental property market and retail and service industries who would have received income during the life of mine from the salaried workforce.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the mine, and that the economy will not decline to its original level prior to the development of this project. This is because the mine will generate substantial income for the regional and local economy, both directly and indirectly, during its life.

It is difficult to predict the actual impact of the mine closure in advance, but it is acceptable to assume that the mine closure will have a negative impact on the local and regional economy with a high probability of occurrence, a high severity and a high significance.

Positive impact include employment and training opportunities for people in the local community and local contractors; social upliftment and community development programmes; economic benefits.

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 of the prospecting operation.
- ❖ The prospecting should be well planned and 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 trenches/excavations continuously.
- ❖ Employ effective rehabilitation strategies to restore surface topography of excavations and plant site.
- ❖ Stabilise the mine residue deposits.
- ❖ All temporary infrastructure 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 prospecting 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 prospecting 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 on site.
- ❖ Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- ❖ All facilities where dangerous 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 prospecting 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 on site.
- ❖ Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- ❖ All facilities where dangerous materials are stored must be contained in a bund wall.
- ❖ Vehicles and machinery should be regularly serviced and maintained.
- ❖ Monitor the quality of the boreholes located down-gradient of the mining site.
- ❖ 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.
- ❖ No uncontrolled discharges from the staff camps to any surface water resources shall be permitted.
- ❖ 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.
- ❖ 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 prospecting 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 prospecting 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

- ❖ Prospecting 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 prospecting 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 prospecting 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. Prospecting should not be delayed after vegetation has been cleared and topsoil removed.

- ❖ Dust suppression methods should, where logistically possible, must be implemented at all areas that may/are exposed for long periods of time.
- ❖ For all prospecting 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 prospecting 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 during in order to facilitate screening during the prospecting 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.

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 if any of these areas are to be found in the prospecting area.
- ❖ 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 prospecting 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

The locality of the prospecting operation is based on the location of the possible diamond 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 prospecting site and associated infrastructure 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.

The prospecting activities and methodologies associated with diamond mining (i.e. open pits with continued backfilling) is the only economic viable method currently being used by the diamond fraternity. There is no alternative prospecting method for the prospecting of 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.

i) 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).

j) 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 20: Assessment of each identified potentially 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	Where new haulage roads will be created the natural habitat of the animals will be disturbed and/or destroyed.	Construction	High	Speed limits Environmental Awareness	High
	Flora	Where new haulage roads will be created the vegetation will be disturbed and/or destroyed.	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 prospecting 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	Construction	No significance	Pollution control and on-going	No Significance

		from the roads that will be used by the planned prospecting operation.			housekeeping	
	Topography	No impact to topography is expected from the roads that will be used by the planned prospecting 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
Pitting/excavating	Air quality	Nuisance dust will be created by mining equipment excavating material from the mining pits.	Operational	High	Dust control Well maintained equipment	Medium
	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	Operational	High	Noise control Well	Medium

		equipment will be created.			maintained equipment	
	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.	Commission-ing	High	Dust control Well maintained equipment	Medium
	Fauna	The natural habitat of the animals will be disturbed and/or destroyed in these areas.	Commission-ing	High	Speed limits Environmental Awareness	High
	Flora	The vegetation will be disturbed and/or destroyed in these areas.	Commission-ing	High	Stripping of topsoil and concurrent rehabilitation	High
	Ground water	No impact to groundwater is expected.	Commission-ing	No Significance	Pollution control and good housekeeping practice	No Significance
	Noise	Noise impact from the mining equipment will	Commission-ing	High	Noise control Well maintained	Medium

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

		structure when the mine residue dam is created			rehabilitation	
	Surface water	No impact to surface water is expected.	Commission-ing	No Significance	Pollution control and on-going housekeeping	No Significance
	Topography	Changing of natural slopes.	Commission-ing	Medium	Concurrent rehabilitation	Low
	Visual	The mine residue dam will be visible to the immediate surroundings.	Commission-ing	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	Medium
	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 plant and processing equipment will be created.	Operational	High	Noise control Well maintained equipment	Medium
	Soil	The disturbance of the soil structure when the plant and	Operational	High	Stripping of topsoil and concurrent rehabilitation	High

		processing area is created.				
	Surface water	The utilization of water from boreholes 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

k) 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 14: 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
See description below			

Attach copies of the Specialist Reports as appendices

An Archaeologist has been contacted to do a survey on the farm for archaeologically sensitive areas on the farm. All information will be used to identify areas that can be sensitive and to make the necessary provision to avoid these areas. Any other Specific specialist reports will be done when specifically requested by any Department or in interested and affected party consultation referred to.

l) 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 prospecting operation are rather negative, while the social impacts are more beneficial. Impacts on vegetation are likely to be most profound, because the prospecting operation will constitute clearance of indigenous vegetation and most likely also the removal of protected species. Protected trees should be avoided as far as possible during invasive prospecting activities. Placement of small access roads and or any other associated infrastructure such as office area and storage areas should avoid slow-growing protected trees as far as possible. Areas with high density protected trees should be regarded as “sensitive” it should be mapped and avoided as far as possible. If protected trees cannot be avoided, a licence must be applied for and obtained prior to disturbance of such species.

A search and rescue of plants of special concern (i.e. endemic species; provincially protected or specially protected species; CITES listed species and TOPS listed species) prior to disturbance of natural vegetation will be done. Succulents such as Aloe species should be rescued and transplanted after obtaining the necessary Flora Permit from the Provincial Department of Environment and Nature Conservation (DENC).

The developer may also need a Flora Permit from the DENC for destruction of natural indigenous, protected or specially protected plant species under the Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA). The same applies to TOPS or CITES listed plant species under the NEMBA.

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 prospecting 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 prospecting 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**

The final site map below indicates the prospecting right application area in which all prospecting will take place. Existing roads are also depicted. 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 100m away from any fixed infrastructure like the road that cuts through the farm and the 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;

Please see final site map below.

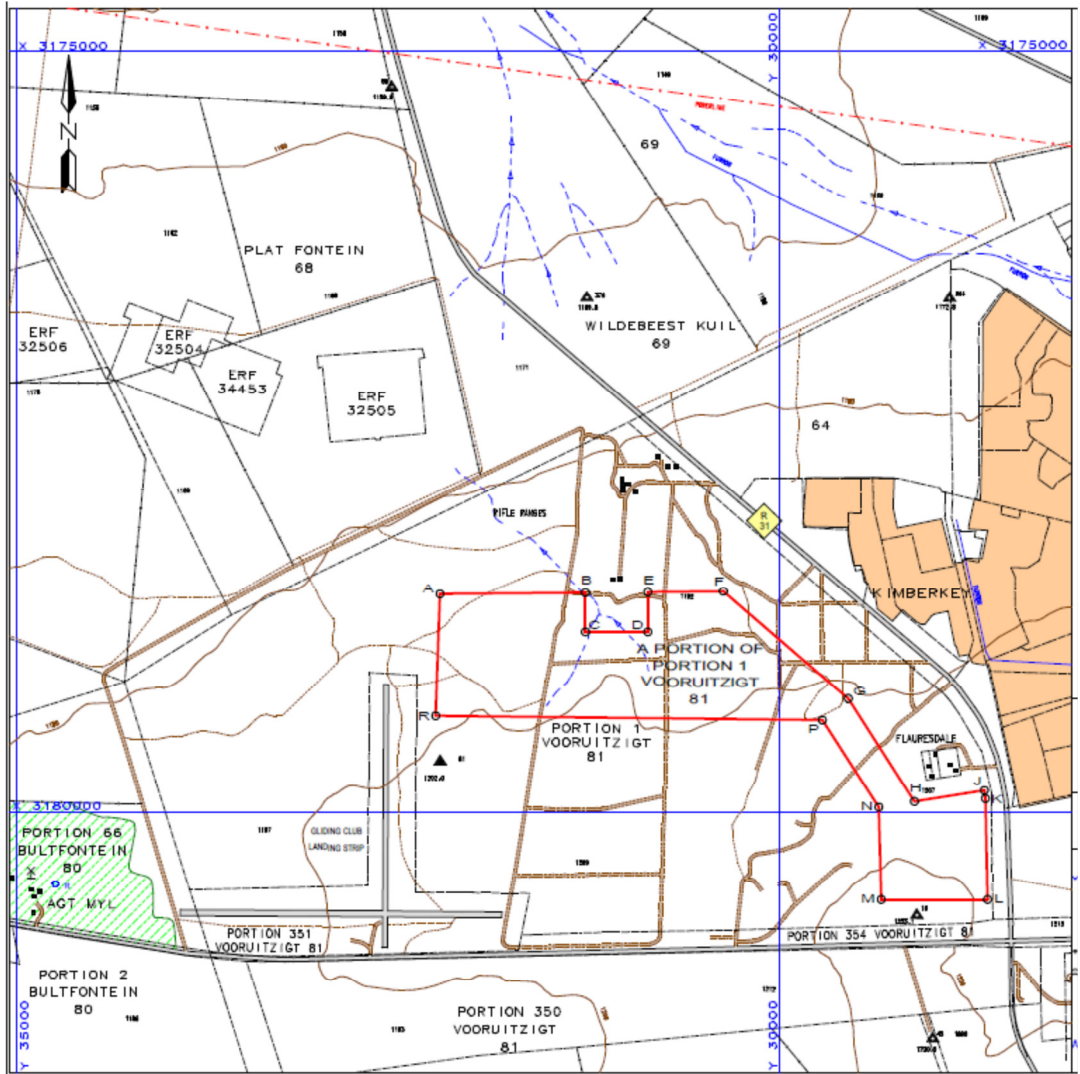


Figure 10: Prospecting site is indicated with a red block and existing roads with brown lines



Figure 11: Each blue block represents five pits in that area.

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

As mentioned before, the specific occurrence of diamonds in the area dictates the selection of the specific prospecting site and there are no alternatives in terms of project location.

The prospecting operation will provide \pm 15 jobs and will also add to the increased economic activity and the area surrounding the farm.

Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR area adhered to e.g. rehabilitation.

m) 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 Mystic Pearl 157 (Pty) Ltd 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 prospecting development does not negatively impact on existing road networks and infrastructure; and to ensure traffic safety.
- To preserve possible 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.

n) Aspects for inclusion as conditions of Authorisation

Any aspects which 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 Authorisation.

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 project specific employees/directors 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 prospecting 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 prospecting operation complies with the conditions set out in the approval of the EMPR.

ii) Conditions that must be included in the authorisation.

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.

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 Basic Assessment Report and the Environmental Management Programme Report.

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

s) Financial Provision

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

The progressive rehabilitation cost that will be paid into the fund to make provision for premature closure and end of life of closure is estimated at **R1,128,488 (one million one hundred and twenty eight rand and four hundred and eighty eight rand)**.

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 Mystic Pearl 157 (Pty) Ltd. 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)

Mystic Pearl (Pty) Ltd does not require any loan mechanism or scheme to undertake prospecting operations, their investment company, Gilmar Corporation Limited, will fund the operation.

Please see agreements attached hereto to proof financial competence.

t) Specific 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 (Provide the results of investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an **Appendix**)

The prospecting operation will have a positive impact. It will have a job creation of 15 workers.

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

No known sites of archaeological and cultural interest occur on or within close proximity to the prospecting area. No mitigation measures will be necessary. The specialist report must still be done. The Company is waiting for a archaeologist to do the survey.

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

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

There are no alternatives, as the application area applied for is the area identified with potential for a diamond prospecting operation.

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 requirements for the provision of the details and expertise of the EAP are already included in PART A, section 1(a).

Confirmed (Mark with an X)	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 is already included in PART A, section 1(h).

Confirmed (Mark with an X)	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 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. 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 the 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.

Please see Final Site Map below.

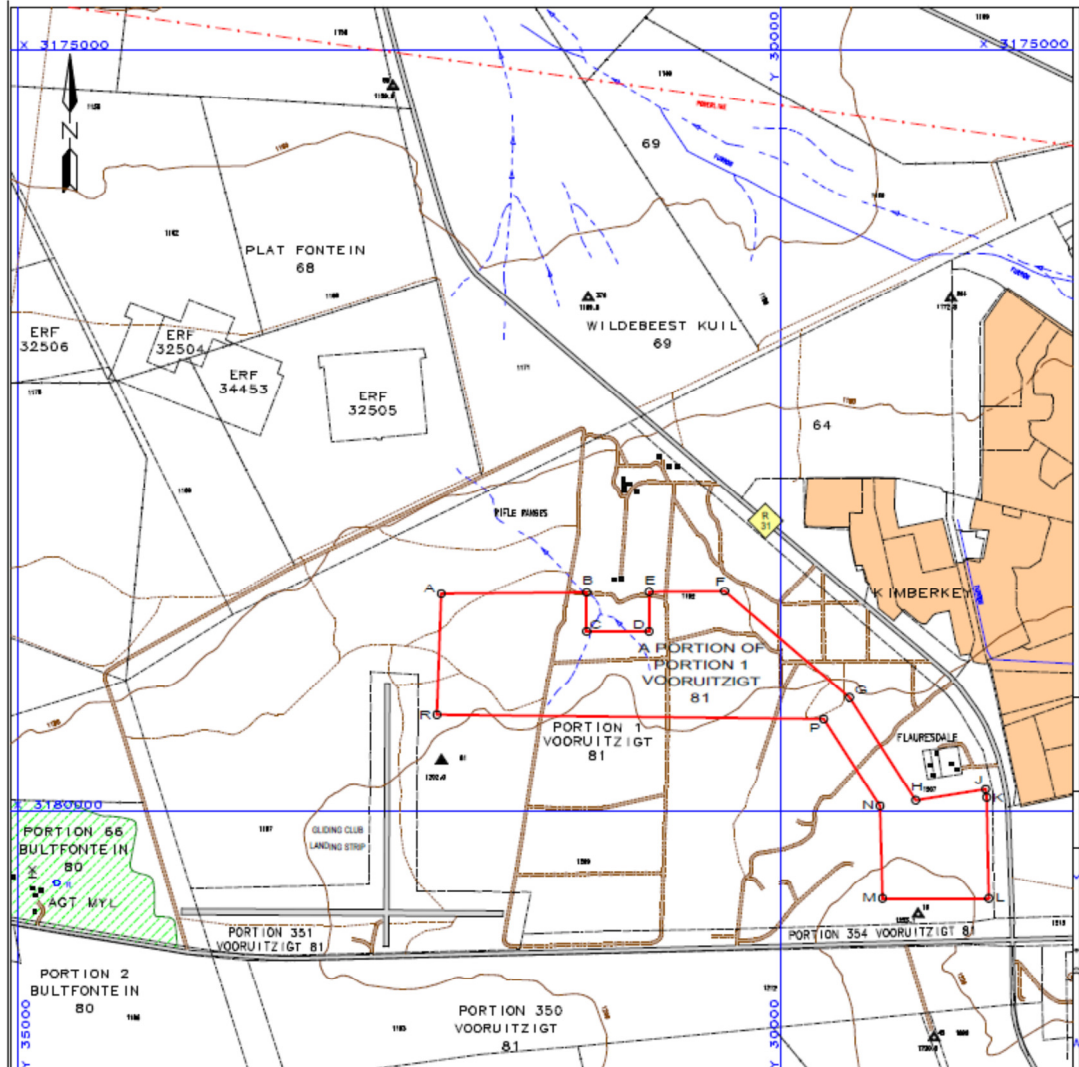


Figure 12: Prospecting site is indicated with a red block and existing roads with brown lines

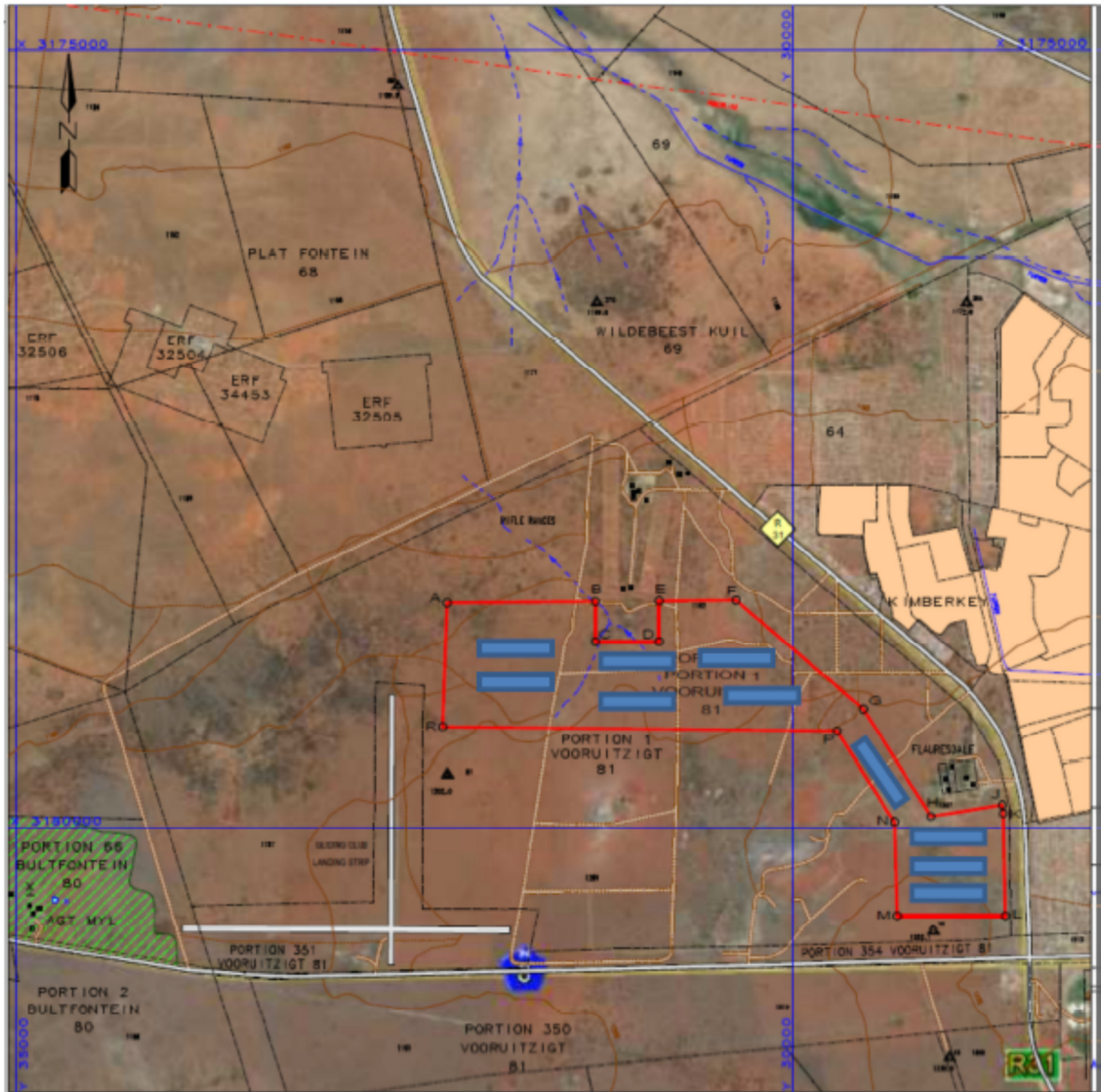


Figure 13: Each blue block represents five pits in that area.

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)

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 will 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 Mystic Pearl 157 (Pty) Ltd 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.

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, Mystic Pearl 157 (Pty) Ltd 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, as addressed in the SLP.
- 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:

- Mystic Pearl 157 (Pty) Ltd 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.
- Mystic Pearl 157 (Pty) Ltd 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) Volumes and rate of water use required for the operation

The operation would require about 360 m³ litres over the two year prospecting operation.

iii) Has a water use licence been applied for?

In the process of applying for a water use licence.

iv) Impact to be mitigated in their respective phases

Table 15: 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 Control measures are to be applied during the implementation of respective activities	Geology Sterilisation of mineral resources	Local	<ul style="list-style-type: none"> - No dumping of materials prior to approval by exploration geologists; - Proper planning of excavations.
	Topography Changes to surface topography due to placement of infrastructure and development of residue deposits	Local	<ul style="list-style-type: none"> - Prominent natural features will not be disturbed such as heritage sites and grave sites if identified; - 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 to erosion Soil contamination due to hydrocarbon spillages	Local	<ul style="list-style-type: none"> - All temporary infrastructures will be demolished during closure; - 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

			<p>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.</p> <ul style="list-style-type: none"> - 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 open pits, the topsoil/subsoil dumps will be replaced for rehabilitation and re-vegetation purposes. Available soils will be used for topsoiling. - 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.
	Biodiversity Loss of biodiversity	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. - Re-establish tree species on the field away from the mining areas. - Set up fixed point monitoring sites to check progress of rehabilitation. - Fence off newly rehabilitated areas and protect from grazing until well established.
	Ground water Contamination of ground water	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 unless agreements are obtained from landowners to do 24hr operation. - 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

			<ul style="list-style-type: none"> 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. - 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 prospecting 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,

			<p>including slopes and uneven ground; c) Vegetate preferential flow paths of storm water runoff.</p> <ul style="list-style-type: none"> - 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			

<p>Construction, operational and decommissioning</p> <p>Control measures are to be applied during the implementation of respective activities</p>	<p>Socio-Economic negative impacts on employment and loitering of people in the area resulting in lack of security and safety</p>	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. - Relationships with local government through LED programmes should be developed. - 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. - SLP commitments will be implemented. - Reach agreements with the municipality regarding mandates and responsibility for issues relating to the upgrading of infrastructure and the allocation of land for housing.
	<p>Interested and affected parties Lack of communication with stakeholders and loss of trust</p>	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.
	<p>Heritage resources Destruction of heritage resources</p>	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.
	<p>Land use Loss of land use</p> <p>Proliferation of alien invasive species</p>	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.
	<p>Employment Loss of jobs and employment</p>	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

			<p>they can be productively absorbed into the local economy after mine closure.</p> <ul style="list-style-type: none"> - 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())

ACTIVITY whether listed or not listed	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE in which impact is anticipated	MITIGATION TYPE	STANDARD TO BE ACHIEVED
(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.)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution, etc...etc...etc.)		(e.g. Construction, commissioning, operational decommissioning, closure, post-closure)	(modify, remedy, control, or stop through e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity, etc...etc.) e.g. <ul style="list-style-type: none"> • Modify through alternative method • Control through noise control • Control through management and monitoring • Remedy through rehabilitation 	(impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
See Table 16					

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) and (d) will be achieved)

ACTIVITY whether listed or not listed (e.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution, etc...etc...etc.)	MITIGATION TYPE (modify, remedy, control, or stop through e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity, etc...etc.) e.g. • Modify through alternative method • Control through noise control • Control through management and monitoring • Remedy through rehabilitation	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
See Table 16				

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 the Regulation.

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 will 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 arrangements will be made by Mystic Pearl 157 (Pty) Ltd to ensure that all natural physical, chemical and biological processes for which a closure condition was 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.

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, the Mystic Pearl Mining 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, as addressed in the SLP.
- 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:

- Mystic Pearl 157 (Pty) Ltd 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.
- Mystic Pearl 157 (Pty) Ltd 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.

The consultation process with interested and affected parties (neighbouring farmers and land owners) was completed. Regular contact sessions will be held with neighbouring farmers and land owners which are currently affected by the prospecting operations. Records will be kept of the complaints and the mitigation measures will be implemented. An advert in the DFA (Diamond Fields Advertiser) was also placed in order for other interested parties to come forward and register as interested parties in the project.

(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 prospecting 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.

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 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 prospecting site that involves the sloping, levelling, replacement of topsoil and the seeding of a grass seed mix in areas that does not recover acceptably as agreed to by the 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 an 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 prospecting 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 current bank guarantee to be submitted to the DMR for mine closure and rehabilitation is to the value of R1,128,488.

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	0.45	12.21	1	1	5.4945
2 (A)	Demolition of steel buildings and structures	m2		170.13	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	150	250.72	1	1	37608
3	Rehabilitation of access roads	m2	15000	30.44	1	1	456600
4 (A)	Demolition and rehabilitation of electrified railway lines	m		295.49	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m		161.18	1	1	0
5	Demolition of housing and/or administration facilities	m2	0.075	340.26	1	1	25.5195
6	Opencast rehabilitation including final voids and ramps	ha	0.5	173174.97	0.52	1	45025.4922
7	Sealing of shafts adits and inclines	m3		91.33	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0.04	118912.29	1	1	4756.4916
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	1	148103.1	1	1	148103.1
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha		430161.62	1	1	0
9	Rehabilitation of subsided areas	ha		99571.13	1	1	0
10	General surface rehabilitation	ha	1	94198.59	1	1	94198.59
11	River diversions	ha		94198.59	1	1	0
12	Fencing	m		107.45	1	1	0
13	Water management	ha		35816.95	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	2	12535.93	1	1	25071.86
15 (A)	Specialist study	Sum				1	0
15 (B)	Specialist study	Sum				1	0
Sub Total 1							811394.5478
1	Preliminary and General		97367.34574		weighting factor 2		97367.34574
2	Contingencies			81139.45478	1		81139.45478
Subtotal 2							989901.35
VAT (14%)							138586.19
Grand Total							1128488

Extent of planned operations as per listed activities used in the quantum table.

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 of this Notice applies. Activity 21 of Listing Notice 2	0.15 ha	X	GNR 984
Excavations being prospected or in the process of being rehabilitated	0.5 ha		Not Listed
Temporary structures (2 x Park Homes)	0.075 ha		Not Listed
Temporary dump	0.04 ha		Not Listed
Roads to the trenches and processing plant	1.5 ha		Not Listed
A mine Residue Dam	1 ha		Not Listed
A water pipeline of unknown length but less than 1000m	1000m		Not Listed
Concrete pollution control at diesel tanks and old oil storage and wash bay	150m ²		Not Listed

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

It is hereby confirmed that the financial provision will be submitted with bank guarantees to the DMR.

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;	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.

	and To reinstate a growth medium able to sustain plant life.			
Air Quality	To control the incidence of unacceptable levels of dust pollution on site.	To ensure that the mine minimizes dust emissions, 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 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 and sources of surface water.	There are no sources in the vicinity of the mine.	Site Manager/Water Supply	No monitoring will be done to monitor the quality of the surface water.
Ground Water	To minimise and prevent as far as practically possible the contamination of ground water.	No ground water is used.	Site Manager/Water Supply	No monitoring will be done to monitor the levels and quality.

Monitoring plan for Mystic Pearl 157 (Pty) Ltd operations

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 	<ul style="list-style-type: none"> ▪ Visual inspection ▪ Walk over rehabilitated areas ▪ Drive along roads ▪ Check pipelines and pumps, mine residue dam and dumps

<ul style="list-style-type: none"> ▪ Drainage lines ▪ Any other area where erosion occurs 	<ul style="list-style-type: none"> ▪ 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 and water storage facilities	Follow specifications in mandatory code of 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 Kimberley 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"> ▪ Testing ground water quality of existing boreholes

l) Indicate the frequency of the submission of the performance assessment/environmental audit report

Annual Performance Assessment and 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 availed 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 the Mystic Pearl Mining 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 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* 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 for disposal:
 - i. Oil, diesel, batteries, acids, paint, thinners, electronic waste.
 - ii. Pesticides, Jik and Handy Andy.

- iii. Old oil, old oil filters, old paint is hazardous and must not be disposed of to a general land fill. Oilkol 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 breath.

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

- **CONCLUSION**

The management of the Mystic Pearl 157 (Pty) Ltd 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 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 prospecting 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 correctness 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) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein.



Signature of the environmental assessment practitioner:

MYSTIC PEARL 157 (PTY) LTD

Name of company:

Date: 29 March 2016

-END-