



**mineral resources**

Department:  
Mineral Resources  
**REPUBLIC OF SOUTH AFRICA**

**DRAFT**

**ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

**And**

**ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

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

**NAME OF APPLICANT:** Highlands Farm Trust

**TEL NO:** 082 551 0622

**FAX NO:** N/A

**POSTAL ADDRESS:** P.O. Box 3, Wolmaransstad. 2630

**PHYSICAL ADDRESS:** Farm Highlands, Wolmaransstad. 2630

**FILE REFERENCE NUMBER SAMRAD:** NW30/5/1/1/2/12618PR

## 1. IMPORTANT NOTICE

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

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

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

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

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

interpreted information and that it unambiguously represents the interpretation of the applicant.

## **2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS**

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

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

## PART A

### SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

#### 3. Contact Person and correspondence address

##### a) Details of

##### i) Details of the EAP

Name of The Practitioner: Mariné Pienaar

Tel No.: 0828283587

Fax No. : None

e-mail address: [mpienaar@terraafrica.co.za](mailto:mpienaar@terraafrica.co.za)

##### ii) Expertise of the EAP.

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

(with evidence).

###### Academic Qualifications:

MSc (Environmental Sciences); University of the Witwatersrand, Johannesburg, South Africa. 2018

BSc (Agric) Plant Production and Soil Science; University of Pretoria, South Africa. 2004

###### Courses Completed:

\* Environmental Impact Assessment - Centre for Environmental Management,

\* Environmental Management Systems - ISO 14001:2004 and

\* Environmental Law, University of Potchefstroom, South Africa. 2008

\* Carbon Footprint Analyst Level 1; Global Carbon Exchange Assessed, 2011

\* World Soils and their Assessment; ISRIC - World Soil Information, Wageningen, The Netherlands. 2015

\* Intensive Agriculture in Arid- and Semi-Arid Environments - Gilat Research Centre, Israel. 2015

\* Hydrus Modeling of Soil-water-Leachate Movement; University of KwaZulu-Natal, South Africa. 2010

\* Global Sustainability Summer School 2012, Institute for Advanced Sustainability Studies, Potsdam, Germany. 2012

\* Wetland Rehabilitation; University of Pretoria, South Africa. 2008

\* Enviropreneurship Institute; Property and Environment Research Centre [PERC], Montana, USA. 2011

\* Youth Encounter on Sustainability; ACTIS Education [official spin-off of ETH Zürich], Switzerland, 2011

###### Professional Registration:

Please refer to **Appendix 1** for proof of qualifications.

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

(In carrying out the Environmental Impact Assessment Procedure)

Mariné Pienaar is the lead consultant and owner of Terra Africa Consult from December 2008 to date. She is a professionally registered scientist who has consulted extensively in several African countries. These countries include South Africa, Liberia, Ghana, DRC, Mozambique, Botswana, Angola, Malawi and Swaziland.

Over the course of her career, she has done several environmental authorisation applications including mining and prospecting permits, water licences, consolidation EIA and EMPs as well as EIAs for agricultural developments.

She is a guest lecturer at the University of the Witwatersrand, Johannesburg on the topic of "Soil and the Extractive Industries" as well as a contributing author on issues of soil quality and food security to the Bureau for Food and Agricultural Policy (BFAP) report.

Mariné presented at the First Global Soil Week and organised sessions at the Second and Third Global Soil Weeks in Berlin, Germany. Mariné has also attended several international conferences and courses including the World Resources Forum in Davos, Switzerland and Conference on Environmental Toxicology and Chemistry in Barcelona, Spain.

Please refer to **Appendix 2** for EAP's curriculum vitae.

**b) Description of the property.**

<b>Farm Name:</b>	Portions 4 and 6 of the farm Roodepoort 206 HO Highlands 392 HO
<b>Application area (Ha)</b>	980
<b>Magisterial district:</b>	Maquassi Hills
<b>Distance and direction from nearest town</b>	3 km East of Wolmaransstad
<b>21 digit Surveyor General Code for each farm portion</b>	T0HO00000000020600004 T0HO00000000020600006 T0HO00000000039200000

**c) Locality map**

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

Please refer to **Appendix 3**.

**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

Please refer to **Appendix 4**

**(i) Listed and specified activities**

NAME OF ACTIVITY (All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
Plant site (16 feet washing pan and conveyor)	± 0.1 ha	X	GNR 327, Activity 20
Ablution facility (temporary)	± 0.0008 ha	X	GNR 327, Activity 20
Sorting facility and vehicle parking area	± 0.04 ha	X	GNR 327 Activity 20
Diesel storage	± 0.005 ha	X	GNR 327 Activity 20
Domestic waste facility	± 0.0008 ha	X	GNR 327 Activity 20
Access road	± 0.4 ha	X	GNR 327 Activity 20
The clearance of 1 ha or more but less than 20 ha of indigenous vegetation.	The surface area affected by pits, 10 trenches (10m x 30m) and stockpiles is anticipated to be less than 2 ha.	X	GNR 327 Activity 27
Excavations	± 0.3 ha, 11 pits 2m x 3m x ± 2m deep and 10 trenches of 10m x 30m x ± 2m deep.	X	GNR 325 Activity 19
Topsoil stockpiles	± 0.2 ha	X	GNR 325 Activity 19

## **(ii) Description of the activities to be undertaken**

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

The proposed activity for which the applicant, Highlands Farm Trust applies is a prospecting right for alluvial diamonds on a total area of 980 ha. The surface area that will be affected by pits and trenches is anticipated to be less than 2 ha. The application area consists mainly of shallow soils of the Hutton and Glenrosa soil forms with a grazing land capability according to the guidelines outlined in Section 7 of The Chamber of Mines Handbook of Guidelines for Environmental Protection (Volume 3, 1981). The application area is situated on Portions 4 and 6 of the farm Roodepoort 206 HO and the farm Highlands 392 HO which is located approximately 3 km East of Wolmaransstad. This area falls under the Maquassi Hills Local Municipality in the North West Province of South Africa. There are no protected areas (game parks, nature reserves, monuments, etc.) close to the proposed prospecting area.

The project will entail an opencast or trenching method of excavation. The ultimate depth of the proposed prospecting operations will be approximately 4m and the water table will not be impacted upon.

Water will be extracted from nearby existing boreholes and brought to the site either by pipeline or water cart. The mineral processing operation will require 1000 – 10000 litres of water per day. The applicant will after the first phases of prospecting are completed and a decision is made of where trenching should be done, apply for a water use licence if deemed necessary.

The applicant will make use of existing farm roads. No foreign material will be placed on the road surfaces and no trees will be uprooted. Employees will travel each day to the site and there will be no accommodation on site.

The project activities will ultimately consist of the following components:

- 2 x 16-foot rotary pans.
- Diesel generator
- Jig
- Front end loader
- Feed conveyor
- Truck Load Backhoe (TLB)
- Diesel cart
- Vehicle parking area.
- Domestic waste facility
- Ablution facility (temporary)
- Security/Workers facility and office (portable trailer)
- Sorting facility
- Access road (existing)

In terms of the phases of the project the construction phase would entail the establishment of temporary infrastructure and only disturbed areas would be utilised as far as possible. Site preparation would also involve clearing and removal of topsoil from the areas to be excavated. Since the applicant will be using mobile and temporary facilities, no destruction will be required in the decommissioning phase.

## **Phases of Prospecting**

### **Phase 1: Site visit**

The whole area for which the Prospecting Right is obtained will be traversed and through the identification of exposed geological structures and lithology of rocky outcrops, decisions will be made regarding desktop studies and other prospecting activities to be done to determine the potential to find alluvial diamonds. The site visit will be done within 120 days after the prospecting right is granted.

### **Phase 2: Desktop studies**

Desktop studies will be done after the site investigation. Areas of interest will be identified through the study of aerial photography, historical information, geological models and remotely sensed data that may be available for prospecting for alluvial diamonds. Planning of infrastructure such as access roads and potential problems and no-go areas will be determined. The desktop studies will take place between five to eight months after the prospecting right is granted.

### **Phase 3: Pitting**

Test pits will be made (2m x 3m x  $\pm$  4m deep) on a grid of 100m x 100m and where there are gravel outcrops on a 50m x 50m grid. The test pits will be made with a 45-ton and/or 20-ton excavator, to determine if any diamond bearing gravel does occur. The test pits will be closed before the excavator move to the next pit. Eighteen months are needed for phase 3.

### **Phase 4: Trenches**

The information obtained during **Phases 1 – 3** will be used to determine the location for trenches. The location and GPS coordinates where excavations will be made, will be mapped. The ultimate goal of the bulk sampling is to recover suitable and representative samples for physical and analytical testing.

The trenches will be 10m x 30m x  $\pm$  4m (deep). In one trench  $\pm$  1200m<sup>3</sup> gravel will be retrieved and tested with 2 X 16-foot rotary pans at a rate of 50 tons (31.25m<sup>3</sup>) an hour. Although the total prospecting area is 980 hectares only 10 trenches are anticipated to be made. Therefore, a total of  $\pm$  12 000m<sup>3</sup> gravel will be tested by making  $\pm$  10 trenches on different locations over the whole prospecting area (as determined in **Phase 3**).

Taken at an eight-hour working day, 5 days a week and 20 days a month, the applicant will be able to process 5 000m<sup>3</sup> a month.

The making of the trenches will take about 14 months (2 months extra to provide for public holidays and bad weather).

The processing of 12 000m<sup>3</sup> of gravel will take about 6 months (2 months extra to provide for public holidays, bad weather and breakdowns).



Rehabilitation of the trenches (before moving to the next trench) will take 2 months per trench, thus 20 months in total for the 10 trenches.

The total time required for **Phase 4** will therefore be approximately 40 months.

#### e) Policy and Legislative Context

<b>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT</b>  (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);	<b>REFERENCE WHERE APPLIED</b>  (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	<b>HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT</b>  (E.g In terms of the National Water Act:-Water Use Licence has/has not been applied for).
The National Environmental Management Act (Act No 107 of 1998)	Whole document	The Environmental Impact Assessment Report is the subject of the Act.
The National Environmental Management: Waste Act (Act No 59 of 2008)	EIAr and EMPr	The application for a prospecting right included Category A, Activity 15 of NEM:WA (Act No 59 of 2008)
Mineral and Petroleum Resources Development Act (Act no 28 of 2002)	Whole document	A Prospecting Right has been applied for: Ref. No. (NW30/5/1/1/2/12618PR)
The National Water Act (Act No 36 of 1998)	Par. D (ii)	Applicant will apply for a Water Use Licence
The National Heritage Resources Act (Act No 25 of 1999)	Table 7 Impact management actions	Identify, assess and manage any heritage resources found in prospecting area. Notify SAHRA.
Conservation of Agricultural Resources Act (Act No 85 of 1983)	Table 7 Tables h(i) &(ix)	Control alien invader plants on disturbed soil.
National Environmental Management: Air Quality Act (Act No 39 of 2004)	Table 7 Impact management actions Tables h(i) &(ix)	Standards for particulates and dust used I IA to regulate the concentration of a substance that can be tolerated without any environmental deterioration.
National Ambient Air Quality Standards (Government Gazette No. 32816) (NAAQS)	Same as above	Same as above.
National Dust Control Regulations (Government Gazette No. 36974)(NDCR)	Same as above	Same as above.
National Environmental Management Biodiversity Act (Act No. 10 of 2004)	Same as above	Impact on Biodiversity on and around proposed site evaluated.
North West Biodiversity Sector Plan (2015) Dr Kenneth Kaunda District Municipality Integrated Development Plan (IDP) Maquassi Hills Local Municipality Integrated Development Plan (IDP)	Par. 3 (f)	Obtain biodiversity, socio-economic and spatial development information of the area relevant to the application area.

#### 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).

Prospecting rights and mining permits have been applied for in this area, historically and recently. Studies on the tributaries of the Vaal River suggests the possibility that further diamond deposits will be found.

Historically, (1904 -1984) the alluvial diamond deposits between Lichtenburg, Ventersdorp, Potchefstroom and Christiana produced some 14.4 million carats valued at over R141.6 million. The area is thus an important supplier of rough diamonds to the international market which is also important for the South African economy.

Few studies have addressed the nature of the alluvial and colluvial deposits in the North West Province in the vicinity of Wolmaransstad and prospecting for diamonds provided an ideal opportunity to study the gravel deposits.

The Maquassi Hills Local Municipality refers in their integrated development plan that Wolmaransstad is an important diamond-buying centre. The regional mining operations are an integral part of its rationale to make use of the abundant natural resources in the area to create job opportunities and prosperous districts. Agriculture and mining is identified as two of the growth and development pillars of the district and it is in line with the North West Provincial Growth and Development Strategy.

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

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

The whole area for which the Prospecting Right is obtained will be traversed and through the identification of exposed geological structures and lithology of rocky outcrops, decisions will be made about where pits and trenches will be made.

Desktop studies will be done after the site investigation. Areas of interest will be identified through the study of aerial photography, historical information, geological models and remotely sensed data that may be available. Planning of infrastructure such as access roads and potential problems and no-go areas will be determined.

Agricultural and game farming activities and operations will be considered to identify areas that will not impact on the farming operations.

The possible areas for pitting and trenching will be assessed against environmental and cultural impacts and the areas that will affect them will be excluded and buffer areas will be established. The possible visual impacts, erosion mitigation and recommendations from the impact assessment process will be used to determine the final area where trenches will be made.

The parameters considered when selecting a site included:

- The environment;
- Streams and rivers;
- Wetlands;
- Fauna, flora and vegetation;
- Social;
- Homesteads;
- Farming;
- Technical;
- Topography and
- Access.

**i) Details of the development footprint alternatives considered.**

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

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

**(a) The property on which or location where it is proposed to undertake the activity**

The property as applied for belong to Highlands Farm Trust who is also the applicant. No other property has been secured by the applicant, Highlands Farm Trust. The Trust do not intend to prospect on land that belong to other land owners. The exact location and extent of bulk sampling is dependent on the results of the desktop studies, site survey and test pitting during phases 1 – 3 as described in the previous section. Mapping of the prospecting could thus not be undertaken at this stage and therefore the overall prospecting area is indicated on the map for the purposes of this report.

(Appendix 3)

**(b) The type of activity to be undertaken**

The different technologies chosen, as indicated in the Prospecting Work Programme, were chosen because of their long term success in terms of their prospecting history. The prospecting activities proposed in the Prospecting Work Programme is dependent on the preceding phase, therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

**(c) The design or layout of the activity**

The exact locality of prospecting activities will only be determined during Phases 1 and 2 of the prospecting work programme (**Appendix 7**). The proposed area

doesn't include any wetland or spruit. It borders in in a certain area on the Makwassie Spruit but a buffer zone of 500m will be reserved where no prospecting will be done. Where applicable a Water Use License will be applied for if necessary for conducting prospecting operations.

No permanent infrastructure will be erected. All ablution facilities, sorting facilities, storage, etc. will be temporary and / or mobile.

#### **(d) The technology to be used in the activity**

In terms of the technologies proposed, these have been chosen based on the historic success rate of the technologies in diamond prospecting. As previously mentioned the prospecting activities proposed in the Prospecting Work Programme is dependent on the previous phase. No alternatives are therefore indicated but rather a phased approach of reliable prospecting techniques.

The preferred technology for the proposed prospecting activity will be to remove the diamond bearing gravel with an excavator, depositing it in a 16 foot rotary pan to be washed and sorted.

Two diamond recovery methods were considered namely the Rotary Pan Plant and Dense Media Separation. Both methods have the same objective, namely to greatly reduce the volume of mineral material that must be processed in order to find diamonds.

Both techniques rely on the principle that diamond is a relatively heavy mineral with a specific of 3,52 g/cubic cm.

The process which is generally used in alluvial operations, is called a Rotary Pan Plant (RPP). In a RPP, the diamond-bearing gravel, sand and earth are mixed with water to create a slurry, often known as a 'puddle' with a specific gravity in the range of 1.3 to 1.5 g/cubic cm. The puddle is then stirred in a pan by rotating angled 'teeth'. The heavier minerals will settle at the bottom of the pan where they are forced down to an area where the concentrate can be extracted. Many of the lighter minerals overflow the pan and can be removed to waste.

A Dense Media Separation (DMS) plant also uses the principle that diamonds are heavier than most of the surrounding rocks and minerals. Most modern DMS plants utilise a hydrocyclone, which is essentially a large centrifuge. All the diamond bearing material is combined with water and ferrosilicon, a fine grained powder that increases the density of the resulting water solution. The cyclone spins at a high rate of speed and the lighter minerals will flow to the top of the cyclone while the heavier minerals, including diamonds, will sink to the bottom where they can be recovered.

Both recovery methods have advantages and disadvantages. The capital required for an equivalent (high) throughput DMS plant is in the order of ten times higher than the capital required for a RPP, but can typically offer better recoveries. Water

usage and operating costs for an equivalent DMS plant are also typically much higher than that of a RPP.

In this project it is anticipated that alluvial deposits will be found which in most cases are spread out over a large geographical area and often require the processing plant to be moved. The requirement for a semi-portable processing plant that can handle large volumes of material is more conducive to RPP applications and it is therefore decided to use a Rotary Pan Plant for this project.

As far as dust suppression on roads is concerned, two methods were considered namely:

- i) application of molasses stillage and
- ii) spraying with water.

In a recent comparative road dust suppression capacity study of molasses stillage and water on gravel roads in Zimbabwe the results were as follows: Dust deposition rates were reduced by 77 - 83 % and by 18 - 39 % for molasses stillage and water treatments respectively.

Molasses stillage requires less water than wetting by water but is much more expensive.

The product may be toxic to aquatic organisms and may cause irritation in humans of the eyes and skin and when ingested or inhaled. Workers should wear special protective clothing when molasses stillage is used.

Water is more cost effective and not harmful to humans, animals or the environment.

Traffic on roads and around the prospecting site should be controlled and minimised to reduce the amount of water to be used for dust suppression.

Considering all the advantages and disadvantages, water will be used for dust suppression purposes at this prospecting activity.

#### **(e) The operational aspects of the activity**

Due to the nature of the prospecting activities, no permanent services in terms of water supply, electricity or sewerage are required.

The 1<sup>st</sup> phases of the activity will comprise of a site investigation and desktop studies as well as the making of test pits. This method of survey will ensure that the applicant can clearly delineate areas which are promising and vindicate further investigation and no unnecessary surface disturbance will occur.

Based on the outcomes of the investigations during phases 1 – 3, trenches will be excavated to determine the volume of gravel present on the property. If gravel is

found the applicant will determine the average grade and grade variation of the gravel.

The applicant will proceed with this way of prospecting by means of the open cast or trenching method, depending on the information obtained during earlier phases of the prospecting process. The trenches will be made to remove, wash and screen the gravel to determine diamond yields per 100 tons of gravel. All data will be consolidated and processed to determine the diamond bearing resources on the property. This will be a continuous process throughout the prospecting work programme.

No feasible alternatives to the pitting and trenching method currently exists. Impacts associated with the prospecting operations will be managed through the implementation of a management plan, developed as part of the application for authorisation.

#### **(f) The option of not implementing the activity**

If the no – go option is followed, it is anticipated that the status quo will remain. This includes no clearing of land, no excavating and earth moving, no mining activities on site, no decommissioning and rehabilitation at the end of the project life.

The option of not approving the activities will lead to a loss of the opportunity to gain knowledge about the alluvial diamond deposits near the tributaries of the Vaal River in the vicinity of Wolmaransstad. In addition to this, should economical reserves be present and the applicant does not have the opportunity to prospect, the opportunity to utilize these resources will be forfeit. The loss will also apply to the creation of jobs and the possible contribution to the GDP of the municipality and the province and the opportunity to improve the local socio-economic situation. Thus the no – go option will not be taken forward into the assessment phase.

#### **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.

### **ADVERTISEMENTS AND NOTICES**

#### **1) Newspaper advertisement**

An advertisement was placed in English in the local newspaper (**Klerksdorp Record**) on the 31<sup>st</sup> of May 2019 (see **Appendix 6**) notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with, and submit their comments to Terra Africa Consult. I&APs were given time

to raise concerns and / or comment within 30 days of the publication of the advertisement.

A second advertisement was placed in the **Klerksdorp Record** on 5 December 2019 (see **Appendix 6**) requesting I&APs to raise concerns and/or comment on or before 25 January 2020.

## **2) Site notices**

Site notices in English were placed on site on the 21<sup>st</sup> of June 2019 to inform surrounding communities and immediately adjacent landowners of the proposed prospecting activities. I&APs were given the opportunity to register as such and comment by 22 July 2019. Photographic evidence of the site notices is included in **Appendix 6**.

Site notices in English were again placed on site on the 29<sup>th</sup> of November 2019 to inform surrounding communities and immediately adjacent landowners of the proposed prospecting activities. I&APs were given the opportunity to comment up to 22 January 2020. Photographic evidence of the site notices is included in **Appendix 6**.

## **3) Direct notification of identified I&APs**

Identified I&APs, including key stakeholders representing various sectors, are directly informed of the proposed development and the availability of the Scoping Report via registered post and email and were requested to submit comments by 18 July 2019. A complete list of stakeholder details and proof of registered post is included in **Appendix 6**.

E-mails and registered post were used to send letters and the draft EIA to key stakeholders and invite them to comment on 29 November 2019. See proof of emails and copies of letters in **Appendix 6**.

The consultees includes:

- i) Department of Economic Development, Environment, Conservation and Tourism.
- ii) Department of Water and Sanitation - North West
- iii) North West Provincial Heritage Resources Authority
- iv) Department of Public Works and Roads, North West
- v) Dr Kenneth Kaunda District Municipality
- vi) Municipal Manager: Maquassi Hills Local Municipality
- vii) Ward Councillor, Ward no 8, Maquassi Hills Local Municipality
- viii) National Department of Agriculture, Forestry and Fisheries

#### **4) Direct notification of surrounding land owners and occupiers**

Written notices and the availability of the Scoping Report are also provided to all surrounding land owners and occupiers on 18 June 2019. The surrounding land owners are given the opportunity to comment until 22 July 2019. For a list of surrounding land owners see **Appendix 6**. Surrounding land owners were again visited during the EIA phase. See evidence attached in **Appendix 6**.

#### **5) Consultation**

The land owner and all surrounding landowners had been visited on appointment and consulted in person about the proposed prospecting operation. This direct consultation provided the opportunity to share information and the I&APs could raise concerns and make comments.

The following surrounding land owners and occupiers had been visited and personally consulted both during the scoping and EIA phases.

Mr. W. Lambrechts (Neighbour)

Mr. W.S.P. Lubbe (Neighbour)

Mr. P. Botma (Neighbour)

Mr. C.D. Botha (Neighbour)

#### **6) Issues Raised by Interested and Affected Parties**

When the comment period ends, comments received will be included in the comments and response table/report. (See **Appendix 6** for comments and response report)



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

Interested and Affected Parties		Date	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Comments Received			
<b><u>AFFECTED PARTIES</u></b>					
<b>Landowner/s</b>	X				
Highlands Farm Trust (J.L.G. Firth – Trustee)		18/06/2019 11/12/2019	No objection Still no objection	The applicant is also the landowner.	
<b>Lawful occupier/s of the land</b>					
<b>Landowners or lawful occupiers on adjacent properties</b>	X				
Mr. P. Botma		27/06/2019 11/12/2019	No objection Still no objection	Noted	
Mr. W. Lambrechts		18/06/2019 11/12/2019	No objection Still no objection	Noted	
Mr. C.D. Botha		18/06/2019 11/12/2019	No objection Still no objection	Noted	
Mr. W.S.P. Lubbe		18/06/2019 11/12/2019	No objection Still no objection	Noted	
<b>Municipal councillor</b>	X				

Maquassi Hills Local Municipality Ward 8 councillor			No comment to date		
<b>Municipality</b>	X				
Maquassi Hills Local Municipality Municipal Manager			No comment to date		
<b>Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e</b>					
Department of Water and Sanitation – North West			No comment to date		
Department of Public Works and Roads – North West			No comment to date		
National Department of Agriculture, Forestry and Fisheries.			No comment to date		
<b>Communities</b>					
<b>Dept. Land Affairs</b>					
<b>Traditional Leaders</b>					
<b>Dept. Environmental Affairs</b>					
Department of Economic Development, Environment, Conservation and Tourism		20/06/2019	Requested copy of EIR	Copy of EIAR and EMPr was sent 29/11/2019.	
<b>Other Competent Authorities affected</b>					
North West Provincial Heritage Resources Authority			No comment to date		

National Department of Agriculture, Forestry and Fisheries.			No comment to date		
Dr Kenneth Kaunda District Municipality		19/06/2019 15/01/2020	Request draft scoping report Comments on EIAr andEMPr. (Find attached in Appendix 6.	Forwarded document to official. All comments are addressed in EIAr and EMPr.	Table 7. Mitigation measures.
<b><u>OTHER AFFECTED PARTIES</u></b>					
<b><u>INTERESTED PARTIES</u></b>					



**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**

The baseline environment is described with specific reference to geotechnical conditions, ecological habitat and landscape features. Soil, land capability and agricultural potential, climate and the visual landscape are taken into account.

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

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

**Geology and Soils**

Fundamental to the evaluation of any prospecting project is a complete understanding of the geological model. It is vitally important to understand the depositional environment and consequently the stratigraphy and sedimentology of the deposits, the effects of climatic and tectonic events, any structural controls as well as the effects of post-depositional evolution of the local landscape.

The diamondiferous gravels are distributed predominantly in three major areas, namely the area underlain by dolomite from the east of Ventersdorp towards Lichtenburg and Bakerville and beyond (VLB), the Lichtenburg-Delareyville-Bloemhof-Klerksdorp-Lichtenburg area (LDBKL) and along the Vaal River. The project site falls within the LDBKL which is mostly underlain by Ventersdorp Supergroup basalt and Dwyka Group tillite and the area associated with the Vaal River terraces and gravels. In the LDBKL area, the diamonds are present in ancient and current river channels, terraces or banks and as alluvial and colluvial deposits.

It was found that the processes, structures and deposits associated with the Dwyka Group, karst formation, erosion and fluvial activity since the Cretaceous period associated with the uplift and erosion of the African surfaces and pedogenesis (soil development) played a major role in the transportation, concentration and confinement of the alluvial diamonds. It is now hypothesised that some diamonds were transported by ice sheets and glaciers during Dwyka Group deposition and may have concentrated along eskers and/or drumlins and /or as a thin sheet of moraine on the Chuniespoort Group dolomite. The directions of movement of the glaciers and preferred orientations of the eskers and possibly drumlins suggest that the Cullinan kimberlite pipe may have been a major source of alluvial diamonds in the North West Province. Relatively thicker deposits of moraine and end-moraine were deposited by fluvioglacial streams and during the melting of ice sheets in the areas underlain by the Ventersdorp Supergroup (LDBKL area). The extent of underlying moraine in the LDBKL area is inferred from

tillite exposed in excavations, erratics on surface and small round pans possibly related to kettles.

It is apparent that Dwyka glaciation had an important influence on the distribution of the diamondiferous gravels and the identification of glacial structures and deposits may therefore be an important aid in targeting potential diamond exploration areas.

### **Ecological habitat and landscape features**

The project site falls partly within the **Kimberley Thornveld** and partly within the **Klerksdorp Thornveld** vegetation type.

According to Mucina and Rutherford (2011: 516), the **Kimberley Thornveld** is distributed in areas of the Free State, North West and Northern Cape Provinces. Most of the Kimberley, Hartswater, Bloemhof and Hoopstad Districts as well as large parts of the Warrenton, Christiana, Taung and Boshof and a smaller part of the Warrenton Districts forms part of the Kimberley Thornveld.

The topography is slightly irregular with a well-developed tree layer mostly dominated by *Vachellia erioloba*, *Vachellia tortilis*, *Vachellia karroo* and *Boscia albitrunca* accompanied by a well-developed shrub layer with occasional dense stands of *Tarchonanthus camphoratus* and *Senegalia mellifera* according to Mucina and Rutherford (2011: 516).

Other important taxa mentioned by Mucina and Rutherford (2011: 516) are low shrubs like *Vachellia hebeclada* subsp. *Hebeclada*, *Euclea crispa* subsp. *ovata*, *Grewia flava* and succulent shrubs like *Aloe hereroensis* var. *hereroensis*. Grass species like *Eragrostis lehmanniana*, *Aristida congesta*, *Cymbopogon pospischilli*, *Digitaria eriantha* subsp. *eriantha*, *Heteropogon contortus* and *Themeda triandra*. The grass layer is open with much uncovered soil.

Mucina and Rutherford (2011: 516) declare further that the Kimberley Thornveld is least threatened. The conservation target is 16%. Only 2% is statutorily conserved in the Vaalbos National Park, Sandveld, Bloemhof Dam and S.A. Lombard Nature Reserves. More or less 18% has been transformed mainly for cultivation. The Kimberley Thornveld is mostly used for cattle farming and game ranching and erosion is very low. Overgrazing leads to encroachment of *Senegalia mellifera* subsp. *detinens*.

The **Klerksdorp Thornveld** is distributed in the North West Province in two areas. The area within which the site falls is in the Wolmaransstad, Ottosdal and Hartbeesfontein region, and the other area occurs from the Botsolano Game Park north of Mahikeng to the vicinity of Madibigo in the south. The Klerksdorp Thornveld has an altitude of 1 260 -1 580 m (Mucina and Rutherford, 2011).

Mucina and Rutherford (2011; 386) declares the conservation status of the Klerksdorp Thornveld as vulnerable with a conservation target of 24%. Currently only about 2.5% is conserved in the Mafikeng Game Reserve, the private Botsolano Game Park and Faan Meintjes Nature Reserve. Almost a third is already transformed by cultivation and urban

sprawl. Because of the vegetation unit's high grazing capacity, it is frequently overutilized. This leads to degradation and invasion by *Vachelia karroo* trees.

The vegetation and landscape features of the Klerksdorp Thornveld can be described as slightly irregular undulating plains with open to dense *Vachelia karroo* bush clumps in dry grassland. Other trees that often occur are *Senegalia caffra*, *Searsia lancea* and *Ziziphus mucronata*. The shrub *Asparagus laricinus* poses an encroachment problem. The herbaceous layer is dominated by graminoids (Mucina and Rutherford, 2011).

### **Land capability and agricultural potential**

- Land capability

Land capability is the inherent capacity of land to be productive under sustained use and specific management methods. The land capability of an area is the combination of the inherent soil properties and the climatic conditions as well as other landscape properties such as slope and drainage patterns that may have resulted in the development of wetlands as an example. Land capability has strong influence on socio-economic aspects of human settlements. Baseline land capabilities are also used as a benchmark for rehabilitation of land in the case of project decommissioning.

The soil and land types identified in the study area could all be classified into two land capability classes. Deeper soils of the Hutton soil form have arable land capability which could also have been suitable for irrigated crop production should irrigation water be available. Because the shallower profiles of the other soil forms present in the study area, restrict root penetration and are thus prone to droughts, the land capability of the remainder of the study area is that of extensive grazing.

- Agricultural potential

- 1) **Dryland crop production**

Deeper soils of the Hutton soil form are suitable and highly suitable for crop production and the annual rainfall of 500mm is sufficient for successful maize production. There is however no dryland crop production on the study area.

- 2) **Irrigated crop production**

The Hutton soil form identified on the study area are suitable for irrigated crop production. Although the establishment of irrigation infrastructure requires high initial capital investment, the site has potential for this production method and the existing operation can be extended, should it ever become a future land use possibility.

- 3) **Cattle farming**

The grazing capacity of a specified area for domestic herbivores is given in either large animal units per hectare or hectares per large animal unit. One large animal unit is regarded as a steer of 450kg whose weight increases with 500g per day on veld with a mean

energy digestibility of 55%. The grazing capacity of the veld for the study area is 7 – 10 hectares per large animal unit. These large stock units can further be converted to include small grazers and browsers such as sheep and Boer goats.

### **Critical Biodiversity Area**

According to the North West Biodiversity Sector Plan (2015: 46) Critical Biodiversity Areas (CBAs) in North west are the portfolio of sites that are required to meet each ecosystem's biodiversity target and need to be maintained in the appropriate ecological condition for their category, referred to as the land management objectives. The land management objective is the desired state that any area should be maintained in, and any land use that is compatible with maintaining this objective could be allowed on site.

The use of CBAs follows the definition laid out in the guideline for publishing bioregional plans (Anon, 2008):  
“Critical Biodiversity Areas (CBAs) are areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services”. The purpose of CBAs is therefore simply to indicate spatially the location of critical or important areas for biodiversity in the landscape. See **Figure 1** for CBAs and ESAs in the North West.

The Dr Kenneth Kaunda District municipality (Dr KKDM) in partnership with the North West Department of Rural, Environment and Agricultural Development (NW READ) and the Department of Environmental Affairs (DEA) embarked on a process to develop an Environmental Management Framework (EMF) for the district.

An EMF is a study of the biophysical and socio-cultural systems of a geographically defined area to reveal where specific activities may best be undertaken and to offer performance standards for achieving and maintaining the desired state of that area.

As stated in the EMF Guidelines (DEA 2010), the management guidelines are not prescriptive regarding land use and do not indicate which land uses must occur in which areas. The guidelines indicate specific minimum environmental requirements and performance criteria which need to be abided by and satisfied before approval of a development application should be considered. See **Figure 2** for Map of Dr KKDM EMF Updated Management Zones.



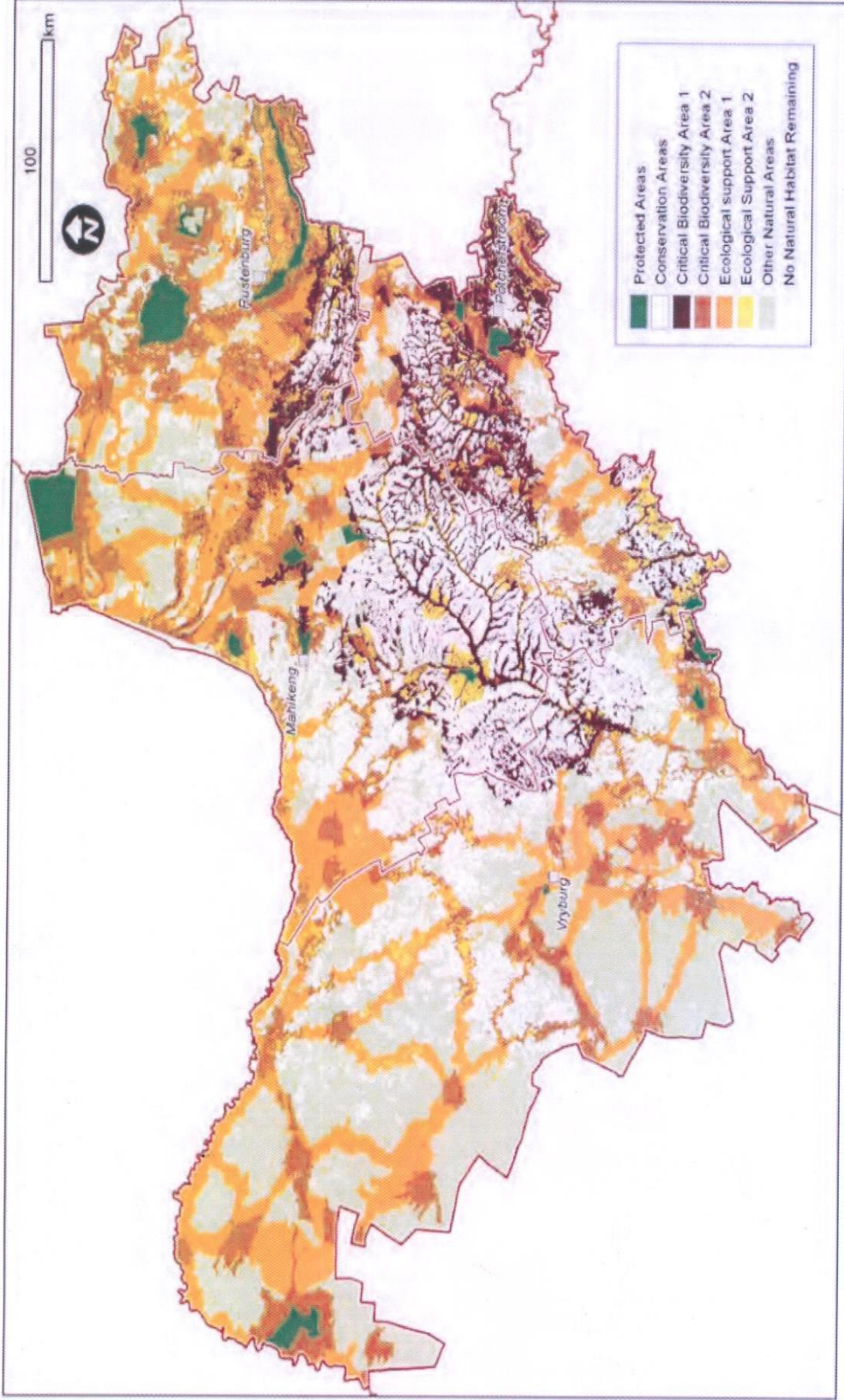


Figure 1: Map of terrestrial Critical Biodiversity Areas and Ecological Support Areas for the North West (North West Biodiversity Sector Plan, 2015)

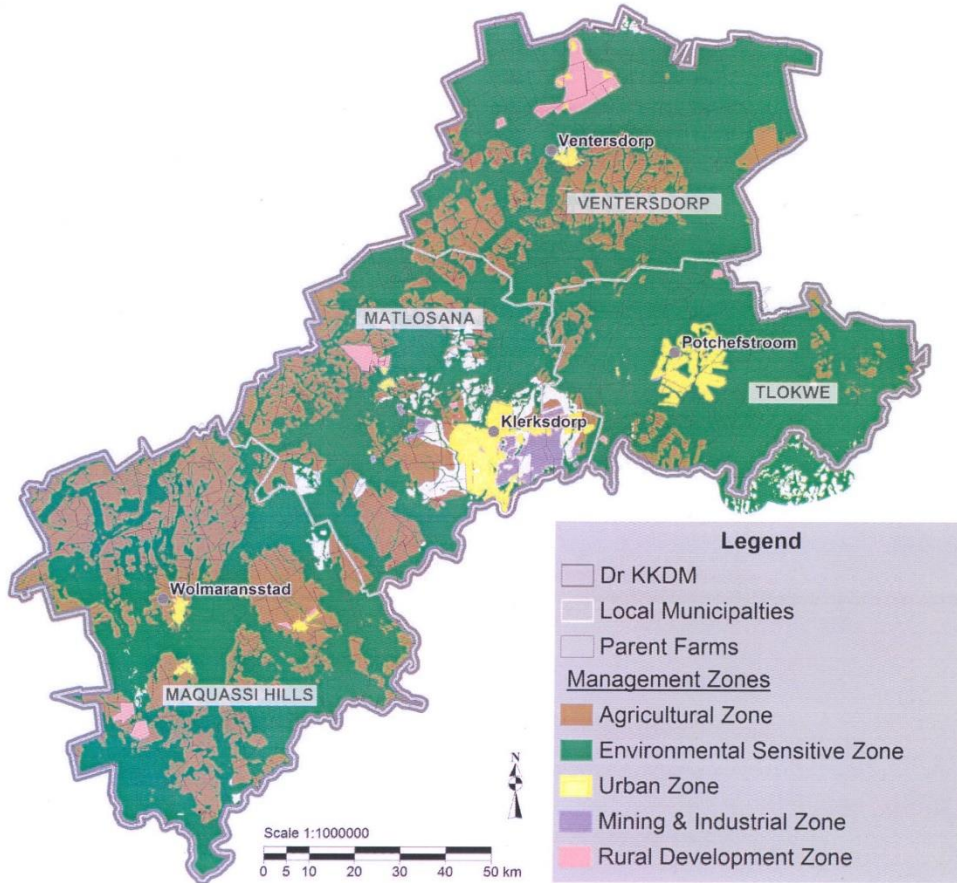


Figure 2: Dr KKDM EMF Updated Management Zones (Dr Kenneth Kaunda DM Draft Strategic Environmental Management Plan, 2016)

## Description of the socio- economic environment

- **Basic services**

The level of basic services in the Dr KKDM is relatively high: 97% households have access to piped water, 82% of households have access to electricity, refuse removal by local authority at 81% of households and 76% of households have access to flush toilets. Dwelling types in the DM is as follows: 53% a house on a separate stand, 6.4% a flat or townhouse or a room in a backyard, 17.4% informal dwellings.

- **Economic performance**

Annual GDP growth in the DM broadly follows the national trend. DM GDP growth is generally lower than both the national and provincial average.

Negative growth rates were experienced in certain local municipalities, mainly in Ventersdorp and Maquassi Hills.

- **Sectoral Comparative Advantage of the DM**

The location quotient is an indication of the comparative advantage of an economy. A location quotient of larger than one (1) indicates a relative comparative advantage in that sector.

Table 1: Location quotients for Dr Kenneth Kaunda District

Sector	Sectoral % contribution to GGP: Dr Kenneth Kaunda District	Sectoral % contribution to GGP: North West Province	Location Quotient: Dr Kenneth Kaunda District
Agriculture	2.3	2.5	0.9
Mining	19.6	26.0	0.8
Manufacturing	8.8	7.6	1.2
Electricity & Water	1.4	1.1	1.3
Construction	3.5	2.9	1.2
Trade	17.3	13.6	1.3
Transport	9.1	10.6	0.9
Finance	16.2	14.5	1.1
Services	8.0	8.6	0.9
Government	13.8	12.7	1.1

- **Location and Economics of Maquassi Hills Local Municipality**

- **Area:** The municipality covers an area of 4 643 km<sup>2</sup>
- **Description:** The Maquassi hills Local Municipality is a Category B municipality situated within the Dr Kenneth Kaunda District Municipality. It borders on Tswaing Local Municipality in the north, the Free State Province in the south, City of Matlosana Local Municipality in the East and Dr Ruth Segomotsi Mompati District Municipality in the west.

- **Cities / Towns:** Leeudoringstad, Makwassie, Witpoort and Wolmaransstad
- **Population:** The total population was 82 012 in 2016.
- **Main Economic Sectors:** Agriculture (49%), domestic (17%), community services (15%) and manufacturing (14%).

### **Cultural and Heritage Aspects**

Special attention was given to the identification of possible cultural or heritage resources on the prospecting site. The initial desktop investigation concluded that there are no obvious heritage resources located on the site where prospecting activities are planned to take place.

#### **(b) Description of the current land uses.**

Even though land use is intrinsically linked to soil and land capability of an area, it is also largely a function of the economic climate and availability of resources additional to productive land. This report deals with the dependency of land users (including fauna) in the project area on the specific soil and land capability properties present and how project impacts may induce land use changes.

The land use on the study area can be defined as crop production (irrigated pecan nut production), game farming and livestock farming on portions 4 and 6 of the farm Roodepoort 206 HO as well as on the farm Highlands 392 HO. There was evidence of cattle grazing on the study area as well as areas fenced off for specialised game farming during the site visit.

The land uses surrounding the proposed project is a combination of farming activities (crop production, irrigated pecan nut production, livestock grazing and game ranching) and diamond mining related activities as well as transport services (the N12 in close vicinity to study area).

Stock and/or game farming will be a viable post mining land use of the study area as long as the field quality is maintained by never exceeding the grazing capacity.

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

The proposed prospecting area borders in the western corner for a short distance on the Makwassie Spruit. Prospecting activities will be kept outside the 500m buffer zone next to the spruit. Where applicable a Water Use Licence Application will be launched for conducting prospecting operations. All prospecting related infrastructure will be temporary and/or mobile.

**(d) Environmental and current land use map.**

(Show all environmental, and current land use features)

An environmental and current land use map is attached in **Appendix 5**.

**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).

This section provides a list of potential impacts on environmental and socio-economic aspects that have been identified in respect of each of the main project activities and processes for each of the project phases. The ratings for consequence, probability and significance of each of the impacts as well as the degree to which these impacts can be mitigated and the significance before and after mitigation are included. The impacts described below have been informed by the consultations with affected parties, as well as expertise in the impact assessment field.



**Table 2: List of potential impacts identified**

POTENTIAL IMPACT DESCRIPTION IN TERMS OF ENVIRONMENTAL ASPECTS	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						DEGREE TO WHICH IMPACT			PROPOSED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
	Consequence			Likelihood			Can be reversed	Causes irreplaceable loss of resources	Can be avoided/ managed/ mitigated		Consequence			Likelihood			Significance rating
	Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact	Significance rating					Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact	Significance rating	
<b>Impacts during construction phase</b>																	
Physical destruction of biodiversity	4	3	5	4	5	108 (H)	Partially	Possible	Can be managed / mitigated to acceptable levels	Keep footprint as small as possible. Ensure workers keep to site boundaries.	3	1	3	3	3	42 (L)	
General disturbance of biodiversity	3	3	5	5	5	110 (H)	Partially			Keep noise levels as low as possible. Prohibit hunting and snaring.	3	1	3	3	3	42 (L)	
Loss of soil resources and land capability through pollution	4	2	4	4	5	90 (MH)	Fully			Maintain vehicles and machinery to prevent spills. Keep hazardous substances in bunded area.	4	1	3	3	3	48 (L)	
Loss of soil resources and land capability through physical disturbance	5	2	5	4	5	108 (H)	Partially			Keep footprint as small as possible. Use only existing access roads.	5	1	3	4	5	81 (MH)	
Disturbance of roads by project related traffic	2	2	3	4	4	56 (ML)	Fully			Minimise trucking and keep to normal operating hours.	2	2	3	3	3	42 (L)	
Contamination of surface water resources	5	3	5	4	4	104 (H)	Fully			Proper set up and maintenance of structures to avoid leaks and spillages.	3	2	3	2	2	32 (L)	
Loss of or damage to heritage / paleontological resources	3	2	3	2	2	32 (L)	Partially			Can be avoided	Report any findings to the heritage authorities.	3	1	3	1	1	14 (VL)
Capital investment in local economy	5	3	5	4	4	(+)104 (H)	Partially	Unlikely	None	5	3	5	4	4	(+) 104 (H)		
Positive socio-economic impact (Temporary employment)	4	3	3	4	4	(+) 80 (MH)	Fully	Unlikely	Can be managed / mitigated to acceptable levels	Employ workers with necessary skills first from the local community.	4	3	3	4	4	(+) 80 (MH)	
Negative socio-economic impact (Inward migration)	3	3	3	3	3	54 (ML)	Fully	Unlikely	Can be managed / mitigated to acceptable levels	"Locals first" employment policy. Keep complaints register.	1	1	3	3	3	30 (L)	
Health and safety of workers	5	1	5	3	3	66 (ML)	Partially	Possible	Can be managed / mitigated to acceptable levels	Health and safety precautions in place, proper training of employees, maintenance of equipment.	3	1	3	3	3	42 (L)	



POTENTIAL IMPACT DESCRIPTION IN TERMS OF ENVIRONMENTAL ASPECTS	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						DEGREE TO WHICH IMPACT			PROPOSED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
	Consequence			Likelihood			Can be reversed	Causes irreplaceable loss of resources	Can be avoided/ managed/ mitigated		Consequence			Likelihood			Significance rating
	Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact	Significance rating					Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact	Significance rating	
<b>Impacts during construction phase</b>																	
Change in land use	5	2	3	4	5	90 (MH)	Fully	Possible	Can be managed / mitigated to acceptable levels	Restrict footprint of mine as much as possible.	4	1	3	4	5	72 (ML)	
<b>Impacts during operational phase</b>																	
Physical destruction of biodiversity	4	3	5	4	5	108 (H)	Partially			Keep footprint as small as possible. Ensure workers keep to site boundaries.	3	1	3	3	3	42 (L)	
General disturbance of biodiversity	3	3	5	5	5	110 (H)	Partially			Keep noise levels as low as possible. Prohibit hunting and snaring.	3	1	3	3	3	42 (L)	
Loss of soil resources and land capability through pollution	4	2	4	4	5	90 (MH)	Fully			Maintain vehicles and machinery to prevent spills. Keep hazardous substances in bunded area.	4	1	3	3	3	48 (L)	
Loss of soil resources and land capability through physical disturbance	5	2	5	4	5	108 (H)	Partially			Keep footprint as small as possible. Use only existing access roads.	5	1	3	4	5	81 (MH)	
Disturbance of roads by project related traffic	2	2	3	4	4	56 (ML)	Fully			Minimise trucking and keep to normal operating hours.	2	2	3	3	3	42 (L)	
Contamination of surface water resources	5	3	5	4	4	104(H)	Fully			Proper set up and maintenance of structures to avoid leaks and spillages.	3	2	3	2	2	32 (L)	
Pollution from emissions to air (dust)	3	4	4	4	4	88 (MH)	Fully			Dust suppression by spraying with water, keeping traffic to a reasonable level.	2	2	3	2	1	21 (VL)	
Negative visual impact	4	2	5	5	5	110 (H)	Fully			Maintain appearance of physical structures	3	2	3	4	4	64 (ML)	
Hazardous excavations that can be harmful to people and animals.	5	4	5	4	5	126 (VH)	Fully			Access control and design of stockpiles	3	1	3	3	3	42 (L)	



POTENTIAL IMPACT DESCRIPTION IN TERMS OF ENVIRONMENTAL ASPECTS	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						DEGREE TO WHICH IMPACT			PROPOSED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
	Consequence			Likelihood			Can be reversed	Causes irreplaceable loss of resources	Can be avoided/ managed/ mitigated		Consequence			Likelihood			Significance rating
	Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact	Significance rating					Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact	Significance rating	
<b>Impacts during operational phase</b>																	
Noise pollution	3	2	3	4	4	64 (ML)	Fully	Unlikely	Can be mitigated	Adaptive project design and management to reduce noise levels.	3	1	3	4	4	56 (ML)	
Loss of or damage to heritage / paleontological resources	3	2	5	4	4	80 (MH)	Partially	Possible	Can be avoided	Report any findings to the heritage authorities.	3	1	3	1	1	14 (VL)	
Capital investment in local economy	5	3	5	4	4	(+)104 (H)	Partially	Unlikely	Can be managed / mitigated to acceptable levels	None	5	3	5	4	4	(+) 104 (H)	
Positive socio-economic impact (Temporary employment)	4	3	3	4	4	(+) 80 (MH)	Fully	Unlikely		Employ workers with necessary skills first from the local community.	4	3	3	4	4	(+) 80 (MH)	
Negative socio-economic impact (Inward migration)	3	3	3	3	3	54 (ML)	Fully	Unlikely	Can be managed / mitigated to acceptable levels	"Locals first" employment policy. Keep complaints register.	1	1	3	3	3	30 (L)	
Health and safety of workers	5	1	5	3	3	66 (ML)	Partially	Possible		Health and safety precautions in place, proper training of employees, maintenance of equipment.	3	1	3	3	3	42 (L)	
Change in land use	5	2	3	4	5	90 (MH)	Fully	Possible		Restrict footprint of mine as much as possible.	4	1	3	4	5	72 (ML)	
<b>Impacts during decommissioning / closure phase</b>																	
General disturbance of biodiversity	3	3	5	5	5	110(H)	Partially	Possible	Can be managed / mitigated to acceptable levels	Keep noise levels as low as possible. Prohibit hunting and snaring.	3	1	3	3	3	42 (L)	
Loss of soil resources and land capability through pollution	4	2	4	4	5	90 (MH)	Fully	Possible		Maintain vehicles and machinery to prevent spills. Keep hazardous substances in bunded area.	4	1	3	3	3	48 (L)	
Loss of soil resources and land capability through physical disturbance	5	2	5	4	5	108 (H)	Partially	Possible		Keep footprint as small as possible. Use only existing access roads.	5	1	3	4	5	81 (MH)	
Contamination of surface water resources	5	3	5	4	4	104(H)	Fully	Possible		Proper set up and maintenance of structures to avoid leaks and spillages.	3	2	3	2	2	32 (L)	

POTENTIAL IMPACT DESCRIPTION IN TERMS OF ENVIRONMENTAL ASPECTS	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION						DEGREE TO WHICH IMPACT			PROPOSED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION						
	Consequence			Likelihood			Can be reversed	Causes irreplaceable loss of resources	Can be avoided/ managed/ mitigated		Consequence			Likelihood			Significance rating
	Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact	Significance rating					Severity	Spatial	Duration	Frequency: Activity	Frequency: Impact	Significance rating	
<b>Impacts during decommissioning / closure phase</b>																	
Pollution from emissions to air (dust)	3	4	4	4	4	88 (MH)	Fully	Unlikely	Can be managed / mitigated to acceptable levels	Dust suppression by spraying with water, keeping traffic to a reasonable level.	2	2	3	2	1	21 (VL)	
Hazardous excavations that can be harmful to people and animals.	5	4	5	4	5	126 (VH)	Fully	Possible		Access control and design of stockpiles	3	1	3	3	3	42 (L)	
Noise pollution	3	2	3	4	4	64 (ML)	Fully	Unlikely		Adaptive project design and management to reduce noise levels.	3	1	3	4	4	56 (ML)	
Negative socio-economic impact (Loss of permanent jobs)	3	2	3	4	4	64 (ML)	Partially	Possible		Skills development during employment, more likely to be employed elsewhere.	3	2	3	3	3	48 (L)	
<b>Impacts during post-closure phase</b>																	
Change in land use	5	2	3	4	5	(+) 90 (MH)	Fully	Possible	Can be managed / mitigated to acceptable levels	Through thorough rehabilitation, the site which is already compromised, can improve and be in a better condition than currently	5	2	5	4	5	(+)108 (H)	

**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).

For the independent consultant to allow for sufficient consideration of all environmental impacts, impacts were assessed using a common, defensible method of assessing significance that will enable comparisons to be made between risks/impacts and will enable authorities, stakeholders and the client to understand the process and rationale upon which risks/impacts have been assessed. The method to be used for assessing risks/impacts is outlined in the sections below.

The first stage of risk/impact assessment is the identification of environmental activities, aspects and impacts. This is supported by the identification of receptors and resources, which allows for an understanding of the impact pathway and an assessment of the sensitivity to change. The definitions used in the impact assessment are presented below.

- An activity is a distinct process or task undertaken by an organisation for which a responsibility can be assigned. Activities also include facilities or infrastructures that are possessed by an organisation.
- An environmental aspect is an 'element of an organizations activities, products and services which can interact with the environment'<sup>1</sup>. The interaction of an aspect with the environment may result in an impact.
- Environmental risks/impacts are the consequences of these aspects on environmental resources or receptors of particular value or sensitivity, for example, disturbance due to noise and health effects due to poorer air quality. In the case where the impact is on human health or well-being, this should be stated. Similarly, where the receptor is not anthropogenic, then it should, where possible, be stipulated what the receptor is.
- Receptors can comprise, but are not limited to, people or human-made systems, such as local residents, communities and social infrastructure, as well as components of the biophysical environment such as wetlands, flora and riverine systems.

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<sup>1</sup> The definition has been aligned with that used in the ISO 14001 Standard.

- Resources include components of the biophysical environment.
- Frequency of activity refers to how often the proposed activity will take place.
- Frequency of impact refers to the frequency with which a stressor (aspect) will impact on the receptor.
- Severity refers to the degree of change to the receptor status in terms of the reversibility of the impact; sensitivity of receptor to stressor; duration of impact (increasing or decreasing with time); controversy potential and precedent setting; threat to environmental and health standards.
- Spatial extent refers to the geographical scale of the impact.
- Duration refers to the length of time over which the stressor will cause a change in the resource or receptor.

The significance of the impact is then assessed by rating each variable numerically according to the defined criteria. Refer to the table below. The purpose of the rating is to develop a clear understanding of influences and processes associated with each impact. The severity, spatial scope and duration of the impact together comprise the consequence of the impact and when summed can obtain a maximum value of 15. The frequency of the activity and the frequency of the impact together comprise the likelihood of the impact occurring and can obtain a maximum value of 10. The values for likelihood and consequence of the impact are then read off a significance rating matrix and are used to determine whether mitigation is necessary<sup>2</sup>.

The assessment of significance is undertaken twice. Initial significance is based on only natural and existing mitigation measures (including built-in engineering designs). The subsequent assessment takes into account the recommended management measures required to mitigate the impacts. Measures such as demolishing infrastructure, and reinstatement and rehabilitation of land, are considered post-mitigation.

The impact assessment model outcome of the impacts was then assessed in terms of impact certainty and consideration of available information to be in line with international best practice guidelines in instances of uncertainty or lack of information by increasing assigned ratings or adjusting final model outcomes.

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<sup>2</sup> Some risks/impacts that have low significance will however still require mitigation

In certain instances where a variable or outcome requires rational adjustment due to model limitations, the model outcomes have been adjusted.

Table 3- Likelihood descriptors for impact assessment

<b>Frequency of Activity</b>	<b>RATING</b>
Annually or less / low	1
6 monthly / temporary	2
Monthly / infrequent	3
Weekly / life of operation / regularly/ likely	4
Daily / permanent / high	5
<b>Frequency of Impact</b>	<b>RATING</b>
Almost never / almost impossible	1
Very seldom / highly unlikely	2
Infrequent / unlikely / seldom	3
Often / regularly / likely / possible	4
Daily / highly likely / definitely	5

Table 4 - Consequence descriptors

<b>Severity of impact</b>	<b>RATING</b>
Insignificant / ecosystem structure and function unchanged	1
Small / ecosystem structure and function largely unchanged	2
Significant / ecosystem structure and function moderately altered	3
Great / harmful/ ecosystem structure and function largely altered	4
Disastrous / ecosystem structure and function seriously to critically altered	5
<b>Spatial scope of impact</b>	<b>RATING</b>
Activity specific/ < 5 ha impacted / Linear features affected < 100m	1
Development specific/ within the site boundary / < 100ha impacted / Linear features affected	2
Local area/ within 1 km of the site boundary / < 2000ha impacted / Linear features affected <	3
Regional within 5 km of the site boundary / < 5000ha impacted / Linear features affected < 10	4
Entire habitat unit / Entire system/ > 5000ha impacted / Linear features affected > 10 000m	5
<b>Duration of impact</b>	<b>RATING</b>
One day to one month	1
One month to one year	2
One year to five years	3
Life of operation or less than 20 years	4
Permanent	5

Table 5 - Likelihood descriptors

		CONSEQUENCE (Severity + Spatial Scope + Duration)														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LIKELIHOOD (Frequency of activity + Frequency of impact)	1	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	2	4	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	3	6	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	4	8	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	5	10	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	6	12	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	7	14	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	8	16	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	9	18	20	30	40	50	60	70	80	90	100	110	120	130	140	150
	10	20														

Table 6: Positive/Negative Mitigation Ratings

Significance Rating	Value	Negative Impact Management Recommendation	Positive Impact Management Recommendation
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
Medium-low	51-75	Maintain current management	Improve current management
Low	26-50	Maintain current management	Improve current management
Very low	1-25	Maintain current management	Improve 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)

Potential impacts that were identified during the scoping process by the independent consultant, in consultation with I&APs, are discussed under environmental component headings below. The potential impacts associated with all the phases (construction, operations, decommissioning and closure) have been identified and described.

With reference to site alternatives, the applicant has not access to other properties than what is applied for. Alternative sites on the property where bulk sampling will be done, will be considered during phase 1 of the Prospecting Work Programme with due consideration of environmental issues.

- **Topography**  
**Issue: Hazardous excavation, infrastructure and surface subsidence**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

## Discussion

Hazardous excavations and infrastructure include all structures into or off which third parties and animals can fall and be harmed. Included in this category is surface subsidence associated with stockpiling of overburden and waste rock. Hazardous excavations occur in the operational and decommissioning phases.

The overall severity in the unmitigated scenario is expected to be high. This can reduce to low with the implementation of management measures focused on access control and design of stockpiles to prevent and/or mitigate impacts. In the event of injury to humans, the potential health impact could be long term in nature. The spatial scale may extend beyond the project site to the communities to which the injured people or animals belong. The significance of this impact is very high without mitigation and could be reduced to low with mitigation.

- **Soils and Land Capability**  
**Issue: Loss of soil and land capability through pollution**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

## Discussion

Soil is a valuable resource that supports a variety of ecological functions. Prospecting operations have the potential to damage soil through hydrocarbon pollution from spills of lubricants and fuel used by vehicles and machinery. A loss of soil resources would result in a decrease in the natural rehabilitation and future land use potential.

The overall severity in the unmitigated scenario is expected to be high and reduces to low in the mitigated scenario if spills are reduced through regular maintenance of equipment and immediate clean-up of spills that do occur. The significance of this impact is medium high in the unmitigated scenario and can be reduced to low by the reduction in probability.

- **Issue: Loss of soil and land capability through physical destruction**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

## Discussion

Soil is key to re-establishing post closure land capability. Soil resources can be disturbed through removal, erosion and compaction which can result in a loss of soil functionality as an ecological driver. There are several activities

and infrastructure (stockpiles) in all phases that have the potential to disturb soils and related land capability.

In the unmitigated scenario, the severity is high as soils will be lost to the area of disturbance, soil functionality will be compromised and soils are likely to erode. The loss of soil and related land capability is long term and will continue after the life of the project. The duration of this impact can be reduced to a shorter period with mitigation as most of the soil can be conserved and used for rehabilitation. The potential loss of soil and land capability through physical disturbance can further be mitigated by minimising of and restriction to the project footprint. The significance of this impact is high in the unmitigated scenario and can be reduced to low with mitigation.

- **Biodiversity**

**Issue: Physical destruction of biodiversity**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The placement of infrastructure and activities in all phases has the potential to destroy biodiversity through the physical destruction of specific biodiversity areas, of linkages between biodiversity areas and related species which are considered to be significant because of their status, and/or the role that they play in the ecosystem.

The loss of biodiversity and related functionality is long term and will continue after the life of the proposed project. In the mitigated scenario, biodiversity may be partially restored during the decommissioning and closure phases.

The duration is therefore high in the unmitigated scenario, reducing to medium in the mitigated scenario. Biodiversity processes are not confined to the proposed site and as such the spatial scale will extend beyond this boundary with and without mitigation. The significance is high without mitigation but can be reduced to medium with correct management measures and concurrent rehabilitation. It can be further reduced to low at closure with emphasis placed on restoring disturbed areas.

**Issue: General disturbance of biodiversity**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The placement of project infrastructure and activities has the potential to directly disturb vegetation, vertebrates and invertebrates in all project phases. Biodiversity can be disturbed by anthropogenic activities such as killing of fauna, illegal removal of fauna and flora species, settlement of dust on vegetation, general noise that may scare off vertebrates and invertebrates, road kills, general litter and establishment of fires. This is a medium severity in



the unmitigated scenario and can be reduced to low in the mitigated scenario. In the unmitigated scenario the impacts are long term but with mitigation the impacts should not extent post closure. Biodiversity processes are not confined to the proposed site area and as such the spatial scale of impacts will extend beyond the site boundary with and without mitigation. In the unmitigated scenario, the significance of this potential impact is high as the probability is definite. With mitigation and a resultant reduction in the probability of the impact, the significance is reduced to medium.

- **Surface Water**

**Issue: Contamination of surface water resources**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Projects of this nature will generally present a number of pollution sources that can have a negative impact on surface water quality if unmanaged in all project phases. The following pollution sources may exist: fuel and lubricants, sewage and chemicals (chemical toilets), dirty water from Rotary Pan Plant, hazardous and general waste and erosion of particles from exposed soils in the form of suspended solids.

In the unmitigated scenario the severity is high and can be reduced to medium with mitigation measures such as diverting clean water away from the disturbed area and containing contaminated run-off and process water for re-use. In the unmitigated scenario pollution events can continue beyond the life of the project but with management pollution can be prevented or mitigated to within the life of the project. In the unmitigated and mitigated scenario, a pollution event may extend beyond the site boundary. The significance of the unmitigated scenario is high and can be reduced to medium/low with mitigation.

- **Air Quality**

**Issue: Pollution from emissions to air**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Prospecting projects present a number of air pollution sources that can have a negative impact on ambient air quality and surrounding land uses in all phases. Pollution sources include land clearing activities, wind erosion from stockpiles, wind erosion of disturbed areas, vehicle movement along unpaved roads and gas emissions mainly from vehicles and generators.

These could have a negative impact on ambient air quality and could result in health impacts for workers on site if not managed. This is a medium severity

in the unmitigated scenario and can be reduced with measures to reduce emissions. Without mitigation the duration of the impacts could extend beyond closure. With mitigation, the duration of the impacts will be limited to the phase prior to closure. The spatial scale of the impact extends off site in both the mitigated and unmitigated scenarios. The significance of this impact is medium high in the unmitigated scenario and can be reduced with mitigation.

- **Noise**

**Issue: Increase in disturbing noise levels**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The project is associated with various noise generating activities in the operational and decommissioning phases. An increase in ambient noise levels has the potential to disturb nearby sensitive receptors. The severity in the unmitigated scenario is expected to be medium and can be reduced to low with mitigation measures. In both the unmitigated and mitigated scenarios, the noise impacts will occur until the closure phase when the noise generating activities are stopped. This is a medium duration. With or without mitigation the noise impacts will extend beyond the project boundary. The significance is medium-low in the unmitigated scenario and can be reduced to low with mitigation.

- **Visual Aspects**

**Issue: Negative visual impacts**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The proposed prospecting area is characterised by open veld with rural agricultural sense of place.

Visual impacts on this receiving environment may be caused by activities in the operational, decommissioning and closure phases. The more significant visual impacts relate to the larger infrastructure components (stockpiles and excavations). After closure the excavations should be closed and the topography of the land restored and the surface rehabilitated.

The severity in the unmitigated scenario is high and is unlikely to reduce with mitigation until the closure phase when the site has been rehabilitated (in the mitigated scenario). The duration will not extend post closure if rehabilitation is done properly. The spatial scale will extend beyond the project boundary in both the unmitigated and mitigated scenario. The significance of this impact is high in the unmitigated scenario. In the mitigated scenario the significance of the impact is medium before closure and low after closure given that the proposed prospecting area will have been rehabilitated.

- **Traffic**

**Issue: Disturbance of roads by project related traffic**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Traffic impacts are expected during the construction and operational phases, during which additional labour may travel to and from the proposed site. The existing traffic on the roads in the vicinity is low therefore the severity in the unmitigated scenario is medium to low. In the mitigated scenario the severity reduces to low because the frequency of potential accidents is expected to reduce. Any serious injury or death is a long-term impact in both the unmitigated and mitigated scenarios. The spatial scale is medium in both the unmitigated and mitigated scenarios given that any injuries or fatalities will extend to the communities to which injured people/animals belong. The significance is medium low and can be reduced to low with mitigation with a reduction in probability.

- **Heritage/cultural and Paleontological Resources**

**Issue: Loss of or damage to Heritage and/or Paleontological Resources**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

No paleontological resources are expected to be found on site; however, this will be verified during the EIA/EMP phase. The potential impact on paleontological resources is therefore not assessed further, however the mitigation measures cover the steps to be taken should there be any chance find.

There are a number of activities in all phases prior to closure that have the potential to remove, damage or destroy heritage/cultural resources should they be encountered, either directly or indirectly, and result in the loss of the resource for future generations. In the unmitigated scenario the severity is medium because no resources have been identified on site. With mitigation measures in place that aim to minimise the disturbance of heritage/cultural sites, the severity is reduced to low. If any cultural/heritage resources are removed damaged or destroyed the impact duration is long term. In the mitigated scenario the duration reduces to less than project life. The special scale will be localised to the prospecting site boundary in both the mitigated and unmitigated scenario. The significance of the impact is medium-high and can be reduced to low with mitigation with a reduction in probability.

- **Socio-economic issues**

**Issue: Economic impact**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

All activities associated with the proposed project will have a net positive socio-economic impact prior to closure on the local economy. Direct benefits are derived from wages, taxes and profits. Indirect benefits through the increased spending power of employees. The severity in both the unmitigated and mitigated scenario is medium positive since the number of employees is small. The positive economic impacts described above will generally be limited to the life of the project. In both the mitigated and unmitigated scenarios, the spatial scale of the impact is medium because it will extend beyond the proposed project area on a regional scale. The significance of the impact in both the unmitigated and mitigated scenarios is a medium-high.

**Issue: Inward Migration (Negative Socio-economic)**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The proposed project may have negative socio-economic impacts in all phases as follows:

Influx of people into the area in search of work, leading to associated problems of crime.

Increased pressure on housing and related services.

Reduced quality of life for surrounding landowners.

Taking the above into consideration but also the fact that it is a small operation with limited job opportunities and very close to town, the severity has been rated as medium without mitigation. It is not foreseen that the negative social issues associated with inward migration will continue beyond the closure of the project in both the mitigated and unmitigated scenario. In both the mitigated and unmitigated scenarios, the impacts of inward migration could extend beyond the site boundary to nearby communities. The significance in the unmitigated scenario is medium-low. In the mitigated scenario, impacts associated with inward migration can be reduced.

- **Land Use**

**Issue: Change in Land Use**

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Activities and infrastructure may have an impact on land uses within and surrounding the proposed project area. The land uses on the property for which a prospecting right is applied for is pecan nut production and grazing of livestock and game. Land uses surrounding the application area include: residential (Tswelelang and Wolmaransstad, farmsteads and labourer's houses), recreational (Wolmaransstad Golf Club), alluvial diamond mining and agriculture (livestock and game farming). These land uses within and surrounding the application area may be affected by one or more of the environmental and social impacts discussed above.

In the unmitigated scenario, the severity is high and can be reduced to medium/ low with mitigation that is focussed on prevention and/or control of each of the environmental and social impact type. In the unmitigated scenario the impact on land use will extend beyond project closure. The spatial scale will probably not extend beyond the application area since hazardous excavations will only occur on small areas within the application area, in both the unmitigated and mitigated scenarios. The probability that land uses will be impacted upon by the project is definite. The unmitigated significance is high where environmental and social impacts are uncontrolled. With mitigation this reduces to medium prior to closure and to low post closure.

**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).

The table below provides a list of the potential impacts identified by the EAP or raised by I&APs as well as the possible management and mitigation measures. The level of residual risk after management or mitigation is also estimated.



Table 7: Possible Mitigation Measures and Anticipated Level of Residual Risk

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Earthworks Transportation Water supply and use General site management Rehabilitation Maintenance and aftercare	Hazardous excavations, surface subsidence and infrastructure	<ul style="list-style-type: none"> <li>▪ Access control, barriers and warning signs at hazardous areas</li> <li>▪ Monitoring and maintenance post closure to ensure long-term safety objectives have been achieved and to identify the need for additional intervention.</li> <li>▪ In case of injury or death due to hazardous excavations, an emergency response procedure must be implemented.</li> </ul>	Low
Site preparation Earthworks Processing plant Transport Water supply and use General site management Rehabilitation Maintenance and aftercare	Loss of soil resources through pollution	<ul style="list-style-type: none"> <li>▪ Training of workers to prevent pollution</li> <li>▪ Equipment and vehicle maintenance</li> <li>▪ Fast and effective clean-up of spills</li> <li>▪ Effective waste management</li> <li>▪ In case of major spillage incidents an emergency response procedure must be implemented</li> </ul>	Low
Earthworks Vehicle movement General site management Rehabilitation Maintenance and aftercare	Loss of soil resources through physical destruction	<ul style="list-style-type: none"> <li>▪ Limit site clearance to what is absolutely necessary</li> <li>▪ Develop and implement a soil management plan that addresses soil stripping, stockpiling and use for rehabilitation.</li> </ul>	Low
Site preparation Earthworks Transport Water supply and use General site management Rehabilitation Maintenance and aftercare	Physical destruction of biodiversity	<ul style="list-style-type: none"> <li>▪ Limit site clearance to what is absolutely necessary</li> <li>▪ Conduct surveys in development footprint areas for species suitable for search and rescue operations.</li> <li>▪ Avoid sensitive areas as far as practically possible.</li> <li>▪ Obtain relevant permits prior to removal of protected tree species.</li> <li>▪ Implementation of an alien invasive species programme</li> <li>▪ Implementation of a biodiversity action plan to ensure that the undeveloped areas within the property are properly conserved and maintained.</li> <li>▪ Effective rehabilitation to as close to pre-project conditions as practically possible.</li> </ul>	Medium
Site preparation Earthworks Transport Water supply and use General site management	General disturbance of biodiversity	<ul style="list-style-type: none"> <li>▪ Limit dust emissions and soiling of vegetation</li> <li>▪ Training of employees on the value of biodiversity</li> <li>▪ Zero tolerance for harming and harvesting fauna and flora</li> <li>▪ Limit noise disturbance as far as possible</li> <li>▪ Effective waste management and pollution prevention</li> </ul>	Medium

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Rehabilitation Maintenance and aftercare		<ul style="list-style-type: none"> <li>▪ Effective rehabilitation to as close to pre-project conditions as practically possible</li> <li>▪ Preventing and combatting veld fires through establishment and maintaining firebreaks and through education of employees in order to comply with the National Veld and Forest Fire Act No. 101 of 1998.</li> </ul>	
Site preparation Earthworks Transport Generators (Power supply) Water supply and use General site management Rehabilitation Maintenance and aftercare	Contamination of surface water resources	<ul style="list-style-type: none"> <li>▪ Project infrastructure will be constructed and operated so as to comply with the National Water Act no. 36 of 1998 and Regulation 704 (4 June 1999):               <ul style="list-style-type: none"> <li>○ Clean and dirty water systems will be separate</li> <li>○ Clean run-off will be diverted away from the site</li> <li>○ Dirty water will be contained</li> <li>○ The necessary exemptions and approvals will be obtained for activities and infrastructure located within 100m or within the 1:100 floodline of the relevant drainage channels or surface water bodies.</li> </ul> </li> <li>▪ Conduct surface water monitoring and implement remedial actions as required</li> <li>▪ Effective equipment and vehicle maintenance</li> <li>▪ Fast and effective clean-up of spills</li> <li>▪ Effective waste management</li> <li>▪ Education and training of workers</li> <li>▪ Effective rehabilitation to as close to pre-project conditions as practically possible.</li> </ul>	Medium / Low
Site preparation Earthworks Transport Generators (Power supply) General site management Rehabilitation Maintenance and aftercare	Air pollution	<ul style="list-style-type: none"> <li>▪ Limit disturbed areas</li> <li>▪ Suppress dust effectively on unpaved roads and at the loading and hauling of gravel</li> <li>▪ Monitor pollutants of concern and implement additional mitigation as required.</li> <li>▪ Maintain vehicles and equipment in good working order.</li> </ul>	Medium
Site preparation Earthworks Transport Generators (Power supply) General site management Rehabilitation	Noise pollution	<ul style="list-style-type: none"> <li>▪ Maintain vehicles and equipment in good working order</li> <li>▪ Limit activities outside normal working hours and over weekends and on public holidays.</li> </ul>	Low



ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Site preparation Earthworks Transport Water supply and use Generators (Power supply) General waste General site management Rehabilitation Maintenance and aftercare	Visual impact	<ul style="list-style-type: none"> <li>▪ Limit disturbed areas</li> <li>▪ Suppress dust to prevent a visual dust cloud</li> <li>▪ Con-current rehabilitation</li> <li>▪ Effective waste management</li> <li>▪ Effective rehabilitation of the overall site.</li> </ul>	Medium and low at closure
Transport	Road disturbance and traffic safety	<ul style="list-style-type: none"> <li>▪ Construct safe access point</li> <li>▪ Educate employees (temporary and permanent) about road safety</li> <li>▪ Enforce strict speed limits</li> <li>▪ If a person or animal is injured by transport activities an emergency response procedure must be implemented</li> </ul>	Low
Site preparation Earthworks Transport Water supply and use Generators (Power supply) General waste General site management Rehabilitation Maintenance and aftercare	Loss of heritage/paleontological resources	<ul style="list-style-type: none"> <li>▪ Limit disturbed areas as far as possible</li> <li>▪ Educate workers about the heritage and cultural sites that may be encountered and about the need to conserve these.</li> <li>▪ These resources are protected by the National Heritage Resources Act No. 25 of 1999 and may not be affected (demolished, altered, renovated, removed) without approval. In the event that resources are identified, emergency procedure must be implemented.</li> </ul>	Low
Site preparation Earthworks Transport Water supply and use Generators (Power supply) General waste General site management Rehabilitation Maintenance and aftercare	Economic impact	<ul style="list-style-type: none"> <li>▪ Maximise positive impacts and minimise negative impacts on surrounding land owners and users</li> <li>▪ Employ local people and procure goods and services locally as far as practically possible</li> <li>▪ Ensure that closure planning considerations address the reskilling of employees.</li> </ul>	Medium positive

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Site preparation Earthworks Transport Water supply and use Generators (Power supply) General waste General site management Rehabilitation Maintenance and aftercare	Inward migration	<ul style="list-style-type: none"> <li>▪ Effective communication with local communities to manage expectations with regard to employment and other opportunities.</li> </ul>	Low
Site preparation Earthworks Transport Water supply and use Generators (Power supply) General waste General site management Rehabilitation Maintenance and aftercare	Land use	<ul style="list-style-type: none"> <li>▪ Effectively manage all social and environmental impacts.</li> <li>▪ Effective rehabilitation of the overall site for post closure land use.</li> </ul>	Medium and low at closure

**ix) Motivation where no alternative sites were considered.**

The property as applied for belong to Highlands Farm Trust who is also the applicant. They do not intend to prospect on land that belong to other land owners. Furthermore, alluvial diamonds were found on the property in the past.

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

The prospecting area is preferred due to its possibility of having diamond reserves. The specific areas that will be surveyed during the initial phases of the prospecting process have identical topographical and geological properties as areas on adjacent properties where successful alluvial diamond mining operations existed.

As stated in (ix) above, there will be no alternative site locations taken forward to the impact assessment phase. In terms of the site layout the following parameters will be considered:

- Environmental;
- Streams and rivers;
- Wetlands;
- Flora, fauna and vegetation;
- Social;
- Homesteads
- Farming;
- Technical;
- Topography; and
- Access.

Impacts to groundwater, biodiversity and heritage resources will therefore be:

- 1) Avoided by location of infrastructure within the mining permit area according to best practice;
- 2) Reduced through implementation of mitigation measures;
- 3) Remedied through rehabilitation and post closure monitoring.

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

The impact assessment methodology comprises several steps that assess the proposed activity's impact on the physical, natural, biological, cultural or human environment. Section (vi) above highlights the methodology used to identify and assess the impacts that the proposed activity will have on the receiving environment.

## 1) Baseline assessment

To identify fatal environmental or social flaws of the project, a desktop study where all knowledge sources of the area were assessed were conducted. Site visits were conducted to determine the possible impacts the proposed project may have. The description of the baseline environment and the socio-economic conditions above provides information on receptors and resources that have been identified as having the potential to be significantly affected by the proposed project. It also describes baseline conditions to provide detail to meet the following objectives:

- To identify the sensitivities in the area that will potentially be affected by the proposed activity;
- To provide data to aid the prediction and evaluation of possible impacts of the proposed project;
- To understand public concerns and expectations regarding the proposed project;
- To develop appropriate mitigation measures;
- To provide a benchmark to measure rehabilitation success.

## 2) Public Participation

Public consultation is done to ensure that the concerns of the public are considered and reported in the final BAR. The objective is to ensure the assessment is robust, transparent and has considered the full range of issues or perceptions to an appropriate level of detail and are addressed in the assessment.

An overview of the consultation process is described in **Appendix 6**.

## 3) Assessment of Impacts and Mitigation

Please refer to **Section (vi)** above for the Impact Assessment Methodology used.

**i) Assessment of each identified potentially significant impact and risk**

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

<b>NAME OF ACTIVITY</b>  (E.g. For prospecting – drill site, site camp, ablation facility, accommodation, equipment storage, sample storage, site office, access route, <b>etc...etc...etc</b>  E.g. for mining – excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablation, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, <b>etc...etc...etc.</b> )	<b>POTENTIAL IMPACT</b>  (Including the potential impacts for cumulative impacts)  (e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc...)	<b>ASPECTS AFFECTED</b>	<b>PHASE</b> in which impact is anticipated  (e.g. Construction, commissioning, operational, decommissioning, closure, post-closure)	<b>SIGNIFICANCE</b> if not mitigated	<b>MITIGATION TYPE</b>  (modify, remedy, control or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)  E.g. Modify through alternative method. Control through noise control. Control through management and monitoring through rehabilitation..	<b>SIGNIFICANCE</b> if mitigated
Site clearance and removal of vegetation	Soil erosion	Soils	Construction	High	Manage & Control via erosion control measures	Medium low
	Indigenous species loss	Fauna/Flora			Remedy through rehabilitation Management measures	
	Faunal Habitat loss	Fauna/Flora			Remedy through rehabilitation Management measures.	
	Alien invasive infestation	Fauna/Flora			Control through alien invasive management	
	Dust generation	Air Quality			Dust control measures, spray with water.	
	Loss of land for grazing	Agriculture			Remedy through rehabilitation	
Earthworks	Soil erosion	Soils	Operational	Low	Manage and control through soil erosion control measures.	Very Low

	Loss of topsoil	Soils			Manage stockpiling of topsoil and remedy through rehabilitation	
	Noise generation	Noise			Noise control measures/ daylight hours.	
	Dust generation	Air quality			Dust control measures, spraying with water	
	Groundwater contamination and extraction	Water resources			Monitor and remedy through Emergency Response Plan and Stormwater Mangement Plan	
	Loss of heritage / paleontological resources	Heritage			Emergency procedures must be implemented	
	Visual intrusion and loss of sense of place	Visual			Control by maintaining an acceptable visual landscape. Remedy through rehabilitation	
Transport	Dust generation	Air quality	Operational	Very low	Dust control measures, spraying with water	Very low
	Increased pressure on the road network	Traffic			Monitor and control through traffic management plan	
	Noise generation	Noise			Manage through vehicle maintenance	
Site preparation (Construction of temporary or mobile site infrastructure)	Dust generation	Air quality	Construction	Low	Dust control measures, spraying with water	Very low
	Noise generation	Noise			Noise control measures/ daylight hours.	
	Visual intrusion / loss of sense of place	Visual			Control by maintaining an acceptable visual landscape. Remedy through rehabilitation	
	Increased pressure on the road network	Traffic			Monitor and control through traffic management plan	
	Soil disturbance resulting in alien	Soils/Flora			Control through alien invasive management	

	invader infestation					
Vehicle movement	Dust generation	Air quality	Construction Operational	Medium low	Dust control measures, spraying with water	Low
	Increased pressure on the road network	Traffic			Monitor and control through traffic management plan	
	Noise generation	Noise			Manage through vehicle maintenance and working daylight hours	
Water supply and use	Pressure on groundwater resources	Water	Construction Operational	Medium low	Control through water conservation measures	Low
	Groundwater contamination	Water			Monitor and remedy through emergency procedures and stormwater management plan	
	Decrease in hydrological processes	Water			Control through water conservation measures	
Storage of diesel and lubricants/vehicle maintenance area/generators	Potential water and/or soil contamination	Water/ soil quality	Operational	Medium low	Monitor and remedy through emergency procedures and stormwater management plan	Very low
	Health and safety of employees	Social			Manage through health and safety plan, control with safety rules	
	Air pollution (Fumes)	Air quality			Manage through maintenance of equipment	
	Noise generation	Noise			Manage through plant maintenance/ Daylight working hours	
	Visual intrusion	Visual			Maintain acceptable visual landscape	
Rehabilitation	Infestation with alien invader plant species	Fauna/Flora	Decommissioning	Low	Control of alien invasive plants	Very Low

	Noise generation	Noise			Noise control measures/ daylight working hours	
	Dust generation	Air quality			Dust control measures	
	Increased pressure on the road network	Traffic			Monitor and control through traffic management plan	
Maintenance and aftercare	Revegetation with indigenous species	Natural vegetation	Post-closure	Medium high (+)	N/A	Medium high (+)
	Restoring of faunal habitat	Fauna			N/A	
	Visual intrusions removed and restoring of sense of place	Social			N/A	

Note: Please refer to Sections (v) and (viii) of this report for Impact Assessment done by EAP.



**j) Summary of specialist reports.**

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

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
<p>The study area consists of the following:</p> <ul style="list-style-type: none"> <li>• A pecan nut orchard which will be excluded from prospecting activities.</li> <li>• Fallow crop fields which are already compromised and while alien invasion control is implemented these areas are used for livestock grazing.</li> <li>• On the remainder of the study area impact assessments and specialist studies were done in the process of transforming it in a conservation area with a lodge and game ranching.</li> <li>• Since the applicant himself is conservation orientated, he wants to perform prospecting activities himself in order to minimise damage to the environment in the process. He therefore also decided to only pay for additional specialist studies if the Department of Mineral Resources insisted upon it.</li> <li>• A Heritage study is being done at the moment</li> </ul>			



## **k) Environmental impact statement**

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

Key findings of the environmental impact assessment can be summarised as follows:

- The significance of potential environmental impacts can be reduced to from **medium low – very low** significance through the implementation of mitigation measures.
- Impacts on the socio-economic environment of the community around the mining site (farmers and their employees living on the farms) can be mitigated to **low** significance.
- Cumulative noise, visual and air quality (dust) impacts are considered to be of **low** significance with the implementation of proper mitigation measures. The visual impact can be positively altered after proper rehabilitation because it is currently already compromised through previous mining activities.
- It is anticipated that cumulative impacts on surface water quality, biodiversity and land use will be **moderate to high** prior to mitigation. Mitigation measures for these potential impacts include:
  - Stormwater and erosion control measures should be maintained during the life of the operation and be continued post- closure.
  - Possible contaminants need to be managed through an effective Emergency Response Plan and Stormwater Management Plan and groundwater quality should be monitored to reduce the significance of the impact.
  - The loss of vegetation on the proposed project site should be mitigated by seeding with an indigenous grass seed blend to restore vegetation.

### **(ii) Final Site Map**

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

Each of the phases of the Prospecting Work Programme are dependent on the results of the preceding phase. The location and extent of soil sampling and possible bulk sampling can therefore not be determined at this stage. A final site layout plan could thus not be produced. For the purposes of this report, the overall prospecting area with areas that should be avoided is represented in **Appendix 5**.

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

A summary of the positive and negative potential impacts associated with the project has been outlined in Section i above and **Table 2**. All impacts listed

above are **negative**, apart from those where it has been stated **positive (+)** in brackets.

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

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

The Environmental Management Programme (EMPr) is part of the requirements of the National Environmental Management Act (NEMA) EIA Regulations published in GN R 983, 984 and 985 on 4 December 2014, and NEM:WA Regulations published in GN R 921 on 29 November 2013 as amended on 7 April 2017. The EMPr is to be submitted to DMR as part of the application for Environmental Authorisation for a prospecting right to prospect for alluvial diamonds and diamonds general by Highlands Farm Trust. The objectives of the EMPr will be to provide detailed information that will advise the planning and design of Highlands Farm Trust mining activities to follow best practise.

The objective of Environmental Management is to construct and operate the prospecting operation project such as to:

- Keep the footprint as small as possible;
- Not disturb surrounding land uses; and
- Contributes to the understanding of the environmental impacts of alluvial diamond mining.

The following objectives are recommended for the management of the environment at the proposed mining endeavour:

- Monitoring and control of alien invader plants during the life of the project and post closure;
- Protect topsoil stockpiles from erosion through revegetation to preserve the quality for successful rehabilitation;
- Restrict footprint of mining and infrastructure as far as possible;
- Monitor and prevent pollution of soil and water resources;
- Limit the visual and noise impacts on receptors;
- Limit dust and other emissions to within allowable limits;
- Avoid impact on possible heritage finds;
- Promote health and safety of workers.

**m) Final proposed alternatives.**

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

Each of the phases of the Prospecting Work Programme are dependent on the results of the preceding phase. The location and extent of soil sampling and

possible bulk sampling can therefore not be determined at this stage. The final layout of infrastructure and activities on the overall site can only be determined after the prospecting right is authorised and the first phases of the prospecting work programme is completed.

**n) Aspects for inclusion as conditions of Authorisation.**

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

Aspects that should be included as conditions of the Environmental Authorization are:

- Development of a Recruitment Policy in accordance with the Employment Equity Act (Act 55 of 1998), Basic conditions of Employment Act, 1997 and the Broad-based Socio-economic Empowerment Charter for the South African Mining and Minerals Industry, 2010.
- No-go buffer zones should be kept next to any wetlands that may be present in the prospecting area as follows:
  - A 500m radius from the boundary of any wetland or pan in accordance with GN 509 of 2016 as it relates to NWA (Act 36 of 1998) (Ecological Assessment Report, 2017).

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

(Which relate to the assessment and mitigation measures proposed)

The following assumptions, uncertainties and gaps in knowledge have been made and identified by the EAP in the impact assessment and development of mitigation measures:

- The exact layout of the site infrastructure is uncertain because each of the phases of the Prospecting Work Programme are dependent on the results of the preceding phase. The location and extent of soil sampling and possible bulk sampling can therefore not be determined at this stage. A final site layout plan could thus only be drawn after environmental authorisation is obtained.
- It is important to note that the absence of species on site does not conclude that the species are not present, but that the absence may be due to the disturbance from farming activities.
- Some plant species, which are small and have short flowering periods, may not have been detected even though they were potentially present on site.
- The heritage study was carried out at the surface only and hence any completely buried archaeological sites or paleontological material was not located.

**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.**

Based on the detailed environmental impact assessment undertaken and the management measures proposed, the EAP is of the opinion that the

application for a prospecting right for diamonds alluvial and diamonds general on the specific site can be granted. The site is already partly transformed by previous mining activities and can be left in an improved state after the life of the proposed activity, provided that the applicant adheres to the management and mitigation measures and conduct proper rehabilitation.

## **ii) Conditions that must be included in the authorisation**

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

- If any archaeological or paleontological material or human burials are uncovered during the mining activities, work should immediately be stopped. The find needs to be reported to the heritage authorities and may require inspection by an archaeologist or palaeontologist as appropriate. Such find is the property of the state and may require excavation and curation in an approved institution. The EMPr should make provision for such a possibility.
- Dust fall monitoring should continue from construction throughout the life of the project.
- Surface and groundwater monitoring every quarter.
- Noise should be kept at acceptable levels.
- Implementation of an erosion monitoring programme throughout all phases of the project.
- No-go buffer zones should be kept next to sensitive areas like wetlands and pans.

### **(2) Rehabilitation requirements**

- Reverse backfilling of all excavations with topsoil at the top.
- The slope must be re-graded (sloped) to approximate the pre-project aspect and contours.
- Mobile infrastructure must be removed from site.
- The previous infrastructure footprint area must be ripped a number of times in order to reduce soil compaction. The area must then be covered with topsoil material from stockpiles.
- Once the land has been prepared, seeding and re-vegetation will contribute to establishing a vegetative cover on disturbed soil to control erosion and to restore disturbed areas to beneficial uses as quickly as possible.
- Indigenous species will be used for the re-vegetation. The exact species will be chosen based on research available and then experience as further areas are to be re-vegetated.
- Control alien invader plants that may occur.

**q) Period for which the Environmental Authorisation is required.**

Environmental Authorisation is required for a period of five 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 is provided at the end of the EMPr and is applicable to both the Environmental Impact Assessment Report and the Environmental Management Programme Report.

**s) Financial Provision**

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

**R112 484.00**

**i) Explain how the aforesaid amount was derived.**

The amount was calculated according to the guideline for the Calculation of Quantum for rehabilitation as provided by DMR. The prospecting operation will involve the excavation of trenches in sections, where after processing, each trench will be closed / rehabilitated and the next trench will be excavated. A total of ten trenches each 30m X 10m will be excavated. Concurrent rehabilitation will be done so that by the cessation of activities, only the last trench will have to be rehabilitated. The open cast rehabilitation fee is thus calculated on a trench size of 300m<sup>2</sup> or 0.03 ha in total.

**ii) Confirm that this amount can be provided for 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).

Mr. J.L.G. Firth, trustee of Highlands Farm Trust, (the applicant) has confirmed that this amount can be provided for from operating expenditure.

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

**i) Deviations from the methodology used in determining the significance of potential environmental impacts and risks.**

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation).

There is no deviation from the approved scoping report.

**ii) Motivation for the deviation.**

Not applicable

**u) Other Information required by the competent Authority**

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

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

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

The proposed prospecting operation is on Portions 4 and 6 of the farm Roodepoort 206 HO and the farm Highlands 392 HO which belong to Highlands Farm trust (the applicant) who has been informed and is in agreement with the proposed project.

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

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(j)(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).

There is no evidence of heritage resources present on site and significant impacts are unlikely. Applicable mitigation measures are included in this report.

**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**).

**Note:** Information on the preferred proposed alternative, as well as the motivation for exclusion of other alternatives has been included in Section g) (i), (vii), (ix) and (x). Kindly refer to these sections above.



## 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).

The requirement for the provision of the details and expertise of the EAP are included in Part A, Section 3 (a) and as Appendices 1 & 2

- 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).

The requirement to describe the aspects of the activity that are covered by the environmental management programme is included in detail in **Part A, Section (h)** of this report.

c) **Composite Map**

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

Each of the phases of the Prospecting Work Programme are dependent on the results of the preceding phase. The location and extent of soil sampling and possible bulk sampling and associated structures and infrastructure can therefore not be determined at this stage. A final site layout plan could thus not be produced. For the purposes of this report, a map of the overall prospecting area with the environmental sensitivities that should be avoided with buffers, is presented in **Appendix 5**.

d) **Description of Impact management objectives including management statements**

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

The prospecting operations should be conducted in such a way that once the operations ceased, the site can be used again for agricultural or game ranching activities. Large parts of the study area are fenced off for specialized game farming, among others buffalo and rare game. The applicant is conservation minded, which is also the reason why he applied for a prospecting right. He wants to determine the potential for diamond mining

himself with the least possible damage to the environment. Degraded areas that exist due to historic crop farming activities are mainly made up of indigenous species with some invasive species in disturbed areas.

The main potential environmental impacts of the proposed activity would be:

- Loss of vegetation and faunal habitat;
- Topography and visual alteration;
- Soil erosion;
- Soil and water resources contamination;
- Impact on water quantity and quality;
- Land capability reduction;
- Spread of alien plant species.

Since some of the impacts already exist on the proposed site the rehabilitation objectives after the life of the project should be as follows:

- To rehabilitate the site in accordance to a detailed closure plan and implement an alien invasive management plan to ensure the establishment of indigenous vegetation;
- To restore the visual state of the site to the topography of surrounding uncompromised areas;
- Implement erosion control methods in vulnerable areas;
- Contain and remove waste from site and prevent and clean-up spills that may occur immediately.

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

The following management measures will be implemented:

- **Cultural and heritage**
  - Personnel will be informed about the consequences of unlawful removal of cultural and historic artefacts.
  - A safe distance of at least 50 metres will be maintained between a heritage resource that may be identified and infrastructure associated with prospecting activities.
- **Noise**
  - Construction, operational and decommissioning activities will be limited to daylight hours on Monday to Saturdays and will not be undertaken at all on Sundays and public holidays.
  - Noise abatement equipment, such as mufflers on diesel engines, will be maintained in good condition.
- **Visual**

- Make use of existing vegetation as far as possible to screen the prospecting operations from view; and
- If necessary, the operations can be screened from view by erecting a shade cloth.

- **Dust fall**

- Wet suppression will be applied to ensure that no visible dust is raised by prospecting operations; and
- Low vehicle speeds will be enforced on unpaved surfaces.

- **Disturbance of soil, vegetation and biodiversity**

- Minimize footprint of prospecting operations as far as possible.
- Minimize compaction of soil by using only existing roads as far as possible; and
- Disturbed areas will be re-vegetated with local indigenous species as soon as possible.
- Should any faunal or floral SCC (Species of Conservation Concern) be found, activities should stop until a biodiversity management plan is developed by an expert.
- No trapping or hunting of faunal species allowed.

- **Contamination of soil, surface water and groundwater**

- Proper vehicle maintenance to prevent spills;
- Refueling will be done with care to minimize the chance of spillages;
- A spill kit will be available on each site where prospecting activities are in progress; and
- Any spillages will be cleaned up immediately.
- Provide and maintain proper sanitary facilities.

- **Pumping and treatment of extraneous water**

- Excavations will not be deeper than 4.5 m and the water table will not be affected. The occurrence of extraneous water that will have to be pumped out is not foreseen.

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

Shallow trenches of maximum 4.5m deep will be excavated during prospecting activities and acid mine drainage is not a possibility.

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

Not applicable to this operation.

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

Not applicable to this operation.

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

Not applicable to this operation

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

The washing and screening activities will use between 5000 to 10 000 litres per day which falls within the General Authorisation in terms of water use of the farm portion, therefore it was assumed that a Section 21 (a) water use licence will not be required for the prospecting operation.

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

Although the proposed prospecting activities has a limited water use as indicated under vii) above, a water use licence will be applied for as soon as the location of bulk sampling areas are determined and boreholes are identified for pump tests.

**ix) Impacts to be mitigated in their respective phases**

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

<b>ACTIVITIES</b>  (E.g. For prospecting – drill site, site camp, ablation 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, ablation, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	<b>PHASE</b>  (of operation in which activity will take place.  State: Planning and Design, Pre-construction, Construction, Operational, Rehabilitation, Closure, Post closure)	<b>SIZE AND SCALE OF DISTURBANCE</b>  (volumes, tonnages and hectares or m <sup>2</sup> )	<b>MITIGATION MEASURES</b>  (Describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	<b>COMPLIANCE WITH STANDARDS</b>  (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	<b>TIME PERIOD FOR IMPLEMENTATION</b>  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.
Site clearance and removal of vegetation	Construction	2 ha	Management and monitoring of soil stockpiles. Soils must be stored properly and revegetated to prevent erosion and to enable re-use during rehabilitation.	Manage and control through Soil Management Plan.	Daily during construction and thereafter quarterly reports.
			Since the site is already transformed the collection and storage of plants is not an option. Specialist advice should be gained to formulate a seed mixture of indigenous plants for rehabilitation.	Remedy through rehabilitation.	

			<p>Appropriately deal with fauna encountered on site.</p> <p>Time construction activities to minimise faunal mortality.</p> <p>Prohibit snaring or hunting of fauna.</p>	<p>Remedy through rehabilitation and Conservation Management Measures</p>	
			<p>Any alien invader infestation already on site should be cleared and thereafter controlled.</p>	<p>Control through Alien Invasive Management measures.</p>	
			<p>Commence (and preferably complete) construction during winter, when the risk of disturbing active (including breeding and migratory) animals, should be least</p>	<p>Remedy through rehabilitation and Conservation Management Measures</p>	
			<p>Set up PM<sup>10</sup> Monitoring sites in the area to monitor dust fall, using acceptable method.</p>	<p>Abide to ambient air quality standards and implement dust control measures (spraying with water)</p>	
			<p>Ensure proper rehabilitation to restore soil properties as good as possible.</p>	<p>Rehabilitation measures</p>	
Earthworks	Operational	300m <sup>2</sup> – 3000m <sup>2</sup>	<p>Preserve whatever topsoil that is available on the transformed site in topsoil stockpiles, revegetate as soon as possible to prevent water and aeolian erosion.</p> <p>Ensure that infrastructure is kept visually acceptable and keep a tidy well organised site. Rubble/litter/waste removal and disposal to be done throughout life of operation.</p> <p>Complaints about night lights should be investigated and documented in a register</p>	<p>Store soil resources according to a Soil Management Plan.</p> <p>Keep site visually acceptable.</p>	Daily inspections and quarterly reports.

			Any alien invader infestation already on site should be cleared and thereafter controlled.	Alien invasive vegetation monitoring and control through Alien Invasive Management Plan	
			Measure noise levels routinely to ensure the noise levels are being kept within the acceptable ISO standards.	Noise control measures must be implemented i.e. maintain machinery as defined in South African National Standards (SANS) /daylight working hours.	
			Ensure that excavated and unpaved areas are sprayed with water to minimise dust generation.	Abide to ambient air quality standards and implement dust control measures (spraying with water)	
			Ensure the design of the facility is done in such a way to adequately separate clean and dirty run-off to prevent water pollution. Clean all accidental spills immediately.	Monitor and remedy through emergency procedures and stormwater management plan	
			Report any archaeological/ paleontological finds or burial places of human remains immediately.	Stop work immediately and manage through Emergency Procedures Management Plan.	
			Set up PM <sup>10</sup> Monitoring sites in the area to monitor dust fall, using acceptable method.	Abide to ambient air quality standards and implement dust control measures (spraying with water)	
Transport of employees and removal of waste	Construction Operational Decommissioning	10 km	Ensure traffic and trucking activities are kept to a schedule to avoid congestion	Traffic Management Plan	Quarterly reports
			Set up PM <sup>10</sup> Monitoring sites in the area to monitor dust fall, using acceptable method.	Abide to ambient air quality standards and implement dust control measures (spraying with water)	
			Measure noise levels routinely to ensure the noise levels are being	Noise control measures	

			kept within the acceptable ISO standards.		
Site preparation (Construction of temporary or mobile site infrastructure)	Construction	1 ha 5 km	The Contractor must ensure that all construction workers are provided with PPE such as dust masks for use when necessary.	Abide to ambient air quality standards and implement dust control measures (spraying with water)	Daily, weekly, quarterly
			Ensure that excavated and unpaved areas are sprayed with water to minimise dust generation.	Abide to ambient air quality standards and implement dust control measures.	
			The construction site should be cleaned regularly, and all construction waste must be removed from site and disposed at a licenced waste disposal facility.	Monitor activities and record and report non-compliance by undertaking inspections.	
			Specialist advice should be gained to formulate a seed mixture of indigenous plants for rehabilitation.	Remedy through rehabilitation.	
			Appropriately deal with fauna encountered on site.	Remedy through rehabilitation and Conservation Management Measures	
			Time construction activities to minimise faunal mortality.		
			Prohibit snaring or hunting of fauna.		
			Measure noise levels routinely to ensure the noise levels are being kept within the acceptable ISO standards.	Noise control measures	
			Ensure that infrastructure is kept visually acceptable and keep a tidy well organised site. Rubble/litter/waste removal and disposal to be done throughout life of operation.	Keep site visually acceptable.	
			Ensure traffic and trucking activities are kept to a schedule to avoid congestion	Traffic Management Plan	



Vehicle movement on site	Operational	2 km	Set up PM <sup>10</sup> Monitoring sites in the area to monitor dust fall, using acceptable method.	Abide to ambient air quality standards and implement dust control measures (spraying with water)	Daily and quarterly reports
			Measure noise levels routinely to ensure the noise levels are being kept within the acceptable ISO standards.	Noise control measures	
			Enforce speed limits on site, keep on existing roads.	Traffic Management Plan	
Water supply and use	Construction Operational Decommissioning Post-closure	10 000 litres	Water conservation to be managed during screening, washing and sorting of gravel.	Measure and control through water conservation measures.	Daily through all phases
			Carry out environmental awareness training with emphasis on water usage and conservation.	Control through water conservation measures	
			Ensure that regular audits of water systems are conducted to identify possible water leakages		
Storage of diesel and lubricants/ vehicle maintenance area/ generators	Construction Operational Decommissioning	0.5 ha	Store diesel and other hazardous fluids in containers with inspectable bottoms to monitor leakages.	Manage possible spills through Emergency Procedures Management Plan.	Daily through all phases
			Store hazardous substances in a bunded area to prevent pollution.	Manage possible spills through Emergency Procedures Management Plan.	
			Do vehicle maintenance off-site in workshops with impenetrable floors.	Prevent oil spills on site.	
			Maintain generators to prevent oil leakages and keep exhaust fumes at acceptable levels	Maintain Ambient Air Quality standards through control measures.	
Rehabilitation	Decommissioning Post – Closure	2 ha	Implement Traffic Monitoring Plan by measuring peaks in traffic and avoiding peak times to ensure traffic flow.	Traffic Management Plan	Quarterly / bi - annually

			Erosion protection measures must be implemented on denuded areas on site to reduce erosion and sedimentation of the receiving environment. Revegetation as soon as possible is the most effective to reduce erosion.	Erosion Management and Rehabilitation Plan	
			Decommissioning personnel must wear proper hearing protection, which should be specified as part of the Risk Assessment carried out by the contractor.	EHS standards	
			Ensure that denuded areas are sprayed with water to minimise dust generation.	Abide to ambient air quality standards and implement dust control measures.	
Maintenance and aftercare	Post – Closure	2 ha	Specialist advice should be gained to formulate a seed mixture of indigenous plants for the revegetation of the mining site.	Remedy through rehabilitation.	Annually
			Restoring of faunal habitat through levelling of excavations and waste rock dumps and revegetation with indigenous vegetation.	Remedy through rehabilitation.	
			Removing of visual intrusions and restoring of sense of	Remedy through rehabilitation.	

### e) Impact Management Outcomes

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

<b>ACTIVITY</b> (whether listed or not)  (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, <b>etc...etc...etc.</b> )	<b>POTENTIAL IMPACT</b>  (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc...)	<b>ASPECTS AFFECTED</b>	<b>PHASE</b> In which impact is anticipated  (e.g. Construction, commissioning, operational, decommissioning, closure, post-closure)	<b>MITIGATION TYPE</b>  (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"> <li>• Modify through alternative method.</li> <li>• Control through noise control</li> <li>• Control through management and monitoring</li> <li>• Remedy through rehabilitation.</li> </ul>	<b>STANDARD TO BE ACHIEVED</b>  (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives, etc).
Site clearance and removal of vegetation	Soil erosion	Soils	Construction	Manage & Control via erosion control measures	Impact avoidance. Visual inspections for signs of erosion
	Indigenous species loss	Fauna/Flora		Remedy through rehabilitation Management measures	Impact avoidance through management actions and visual inspections and rehabilitation if needed.
	Faunal Habitat loss	Fauna/Flora		Remedy through rehabilitation Management measures.	Impact avoidance through management actions and visual inspections and rehabilitation if needed.
	Alien invasive infestation	Fauna/Flora		Control through alien invasive management	Impact avoidance. Visual inspections for signs of invasion.
	Dust generation	Air Quality		Dust control measures, spray with water.	Dust fallout may not exceed 1200 mg/m <sup>2</sup> /day averaged over 30 days.
	Loss of land for grazing	Agriculture		Remedy through rehabilitation	Rehabilitate and revegetate disturbed areas to pre-mining conditions.

Earthworks	Soil erosion	Soils	Operational	Manage and control through soil erosion control measures.	Impact avoidance. Visual inspections for signs of erosion
	Loss of topsoil	Soils		Manage stockpiling of topsoil and remedy through rehabilitation	Impact avoidance. Visual inspections for signs of erosion
	Noise generation	Noise		Noise control measures/ daylight hours.	Noise monitoring if needed to ensure noise levels are below 45 dBA.
	Dust generation	Air quality		Dust control measures, spraying with water	Dust fallout may not exceed 1200 mg/m <sup>2</sup> /day averaged over 30 days.
	Groundwater contamination and extraction	Water resources		Monitor and remedy through Emergency Response Plan and Stormwater Mangement Plan	Impact avoidance through management actions and visual inspections and clean-up if needed.
	Loss of heritage / paleontological resources	Heritage		Emergency procedures must be implemented	Impact avoidance through management actions and visual inspections and stop work and notify SA Police Services (in case of human remains) and Heritage Resources North West.
	Visual intrusion and loss of sense of place	Visual		Control by maintaining an acceptable visual landscape. Remedy through rehabilitation	Impact avoidance through management actions and visual inspections and rehabilitation if needed.
Transport	Dust generation	Air quality	Operational	Dust control measures, spraying with water	Dust fallout may not exceed 1200 mg/m <sup>2</sup> /day averaged over 30 days.
	Increased pressure on the road network	Traffic		Monitor and control through traffic management plan	Impact avoidance through management actions.
	Noise generation	Noise		Manage through vehicle maintenance	Noise monitoring if needed to ensure noise levels are below 45 dBA.
Site preparation (Construction of temporary or mobile site infrastructure)	Dust generation	Air quality	Construction	Dust control measures, spraying with water	Dust fallout may not exceed 1200 mg/m <sup>2</sup> /day averaged over 30 days.
	Noise generation	Noise		Noise control measures/ daylight hours.	Noise monitoring if needed to ensure noise levels are below 45 dBA.
	Visual intrusion / loss of sense of place	Visual		Control by maintaining an acceptable visual landscape. Remedy through rehabilitation	Impact avoidance through management actions and visual inspections and rehabilitation if needed.

	Increased pressure on the road network	Traffic		Monitor and control through traffic management plan	Impact avoidance through management actions.
	Soil disturbance resulting in alien invader infestation	Soils/Flora		Control through alien invasive management	Impact avoidance. Visual inspections for signs of invasion.
Vehicle movement	Dust generation	Air quality	Construction Operational	Dust control measures, spraying with water	Dust fallout may not exceed 1200 mg/m <sup>2</sup> /day averaged over 30 days.
	Increased pressure on the road network	Traffic		Monitor and control through traffic management plan	Impact avoidance through management actions.
	Noise generation	Noise		Manage through vehicle maintenance and working daylight hours	Noise monitoring if needed to ensure noise levels are below 45 dBA.
Water supply and use	Pressure on groundwater resources	Water	Construction Operational	Control through water conservation measures	Impact avoidance through management actions.
	Groundwater contamination	Water		Monitor and remedy through emergency procedures and stormwater management plan	Impact avoidance through management actions and visual inspections and clean-up if needed.
	Decrease in hydrological processes	Water		Control through water conservation measures	Impact avoidance through management actions.
Storage of diesel and lubricants/vehicle maintenance area/generators	Potential water and/or soil contamination	Water/ soil quality	Operational	Monitor and remedy through emergency procedures and stormwater management plan	Impact avoidance through management actions and visual inspections and clean-up if needed.
	Health and safety of employees	Social		Manage through health and safety plan, control with safety rules	Impact avoidance through management actions and visual inspections and clean-up if needed.
	Air pollution (Fumes)	Air quality		Manage through maintenance of equipment	The occupational exposure limit of CO <sub>2</sub> is 50 ppm for a 40-hour work week. It is highly unlikely that this level will be reached in the general environment
	Noise generation	Noise		Manage through plant maintenance/ Daylight working hours	Noise monitoring if needed to ensure noise levels are below 45 dBA.

	Visual intrusion	Visual		Maintain acceptable visual landscape	Impact avoidance through management actions and visual inspections and rehabilitation if needed.
Rehabilitation	Infestation with alien invader plant species	Fauna/Flora	Decommissioning	Control of alien invasive plants	Impact avoidance. Visual inspections for signs of invasion.
	Noise generation	Noise		Noise control measures/ daylight working hours	Noise monitoring if needed to ensure noise levels are below 45 dBA.
	Dust generation	Air quality		Dust control measures	Dust fallout may not exceed 1200 mg/m <sup>2</sup> /day averaged over 30 days.
	Increased pressure on the road network	Traffic		Monitor and control through traffic management plan	Impact avoidance through management actions.
Maintenance and aftercare	Revegetation with indigenous species	Natural vegetation	Post-closure	N/A	N/A
	Restoring of faunal habitat	Fauna		N/A	N/A
	Visual intrusions removed and restoring of sense of place	Social		N/A	N/A

**f) Impact Management Actions**

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

<p><b>ACTIVITY</b> 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, <b>etc...etc...etc.</b>)</p>	<p><b>POTENTIAL IMPACT</b>  (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc...)</p>	<p><b>MITIGATION TYPE</b>  (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"> <li>• Modify through alternative method.</li> <li>• Control through noise control</li> <li>• Control through management and monitoring</li> <li>• Remedy through rehabilitation.</li> </ul> </p>	<p><b>TIME PERIOD FOR IMPLEMENTATION</b>  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.</p>	<p><b>COMPLIANCE WITH STANDARDS</b>  (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)</p>
<p>Site clearance and removal of vegetation</p>	<p>Soil erosion</p>	<p>Manage &amp; Control via erosion control measures</p>	<p>Cessation of individual activity</p>	<p>Impact avoidance. Visual inspections for signs of erosion</p>
	<p>Indigenous species loss</p>	<p>Remedy through rehabilitation Management measures</p>	<p>Cessation of alluvial diamond prospecting.</p>	<p>Impact avoidance through management actions and visual inspections and rehabilitation if needed.</p>
	<p>Faunal Habitat loss</p>	<p>Remedy through rehabilitation Management measures.</p>	<p>Cessation of alluvial diamond prospecting.</p>	<p>Impact avoidance through management actions and visual inspections and rehabilitation if needed.</p>
	<p>Alien invasive infestation</p>	<p>Control through alien invasive management</p>	<p>Cessation of alluvial diamond prospecting.</p>	<p>Impact avoidance. Visual inspections for signs of invasion.</p>
	<p>Dust generation</p>	<p>Dust control measures, spray with water.</p>	<p>Cessation of individual activity</p>	<p>Dust fallout may not exceed 1200 mg/m<sup>2</sup>/day averaged over 30 days.</p>
	<p>Loss of land for grazing</p>	<p>Remedy through rehabilitation</p>	<p>Cessation of alluvial diamond prospecting.</p>	<p>Rehabilitate and revegetate disturbed areas to pre-mining conditions.</p>

Earthworks	Soil erosion	Manage and control through soil erosion control measures.	Cessation of individual activity	Impact avoidance. Visual inspections for signs of erosion
	Loss of topsoil	Manage stockpiling of topsoil and remedy through rehabilitation	Cessation of alluvial diamond prospecting.	Impact avoidance. Visual inspections for signs of erosion
	Noise generation	Noise control measures/ daylight hours.	Cessation of individual activity	Noise monitoring if needed to ensure noise levels are below 45 dBA.
	Dust generation	Dust control measures, spraying with water	Cessation of individual activity	Dust fallout may not exceed 1200 mg/m <sup>2</sup> /day averaged over 30 days.
	Groundwater contamination and extraction	Monitor and remedy through Emergency Response Plan and Stormwater Mangement Plan	Cessation of individual activity	Impact avoidance through management actions and visual inspections and clean-up if needed.
	Loss of heritage / paleontological resources	Emergency procedures must be implemented	Cessation of individual activity	Impact avoidance through management actions and visual inspections and stop work and notify SA Police Services (in case of human remains) and Heritage Resources North West.
	Visual intrusion and loss of sense of place	Control by maintaining an acceptable visual landscape. Remedy through rehabilitation	Cessation of alluvial diamond prospecting.	Impact avoidance through management actions and visual inspections and rehabilitation if needed.
Transport	Dust generation	Dust control measures, spraying with water	Cessation of alluvial diamond prospecting.	Dust fallout may not exceed 1200 mg/m <sup>2</sup> /day averaged over 30 days.
	Increased pressure on the road network	Monitor and control through traffic management plan	Cessation of alluvial diamond prospecting.	Impact avoidance through management actions.
	Noise generation	Manage through vehicle maintenance	Cessation of alluvial diamond prospecting.	Noise monitoring if needed to ensure noise levels are below 45 dBA.
Site preparation (Construction of temporary or mobile site infrastructure)	Dust generation	Dust control measures, spraying with water	Cessation of individual activity	Dust fallout may not exceed 1200 mg/m <sup>2</sup> /day averaged over 30 days.
	Noise generation	Noise control measures/ daylight hours.	Cessation of individual activity	Noise monitoring if needed to ensure noise levels are below 45 dBA.
	Visual intrusion / loss of sense of place	Control by maintaining an acceptable visual landscape. Remedy through rehabilitation	Cessation of alluvial diamond prospecting.	Impact avoidance through management actions and visual inspections and rehabilitation if needed.
	Increased pressure on the road network	Monitor and control through traffic management plan	Cessation of individual activity	Impact avoidance through management actions.



	Soil disturbance resulting in alien invader infestation	Control through alien invasive management	Cessation of alluvial diamond prospecting.	Impact avoidance. Visual inspections for signs of invasion.
Vehicle movement	Dust generation	Dust control measures, spraying with water	Cessation of individual activity	Dust fallout may not exceed 1200 mg/m <sup>2</sup> /day averaged over 30 days.
	Increased pressure on the road network	Monitor and control through traffic management plan	Cessation of individual activity	Impact avoidance through management actions.
	Noise generation	Manage through vehicle maintenance and working daylight hours	Cessation of individual activity	Noise monitoring if needed to ensure noise levels are below 45 dBA.
Water supply and use	Pressure on groundwater resources	Control through water conservation measures	Cessation of alluvial diamond prospecting.	Impact avoidance through management actions.
	Groundwater contamination	Monitor and remedy through emergency procedures and stormwater management plan	Cessation of alluvial diamond prospecting.	Impact avoidance through management actions and visual inspections and clean-up if needed.
	Decrease in hydrological processes	Control through water conservation measures	Cessation of alluvial diamond prospecting.	Impact avoidance through management actions.
Storage of diesel and lubricants/vehicle maintenance area/generators	Potential water and/or soil contamination	Monitor and remedy through emergency procedures and stormwater management plan	Cessation of alluvial diamond prospecting.	Impact avoidance through management actions and visual inspections and clean-up if needed.
	Health and safety of employees	Manage through health and safety plan, control with safety rules	Cessation of alluvial diamond prospecting.	Impact avoidance through management actions and visual inspections and clean-up if needed.
	Air pollution (Fumes)	Manage through maintenance of equipment	Cessation of alluvial diamond prospecting.	The occupational exposure limit of CO <sub>2</sub> is 50 ppm for a 40-hour work week. It is highly unlikely that this level will be reached in the general environment
	Noise generation	Manage through plant maintenance/ Daylight working hours	Cessation of alluvial diamond prospecting.	Noise monitoring if needed to ensure noise levels are below 45 dBA.
	Visual intrusion	Maintain acceptable visual landscape	Cessation of alluvial diamond prospecting.	Impact avoidance through management actions and visual inspections and rehabilitation if needed.
Rehabilitation	Infestation with alien invader plant species	Control of alien invasive plants	Cessation of alluvial diamond prospecting.	Impact avoidance. Visual inspections for signs of invasion.
	Noise generation	Noise control measures/ daylight working hours	Cessation of alluvial diamond prospecting.	Noise monitoring if needed to ensure noise levels are below 45 dBA.

	Dust generation	Dust control measures	Cessation of alluvial diamond prospecting.	Dust fallout may not exceed 1200 mg/m <sup>2</sup> /day averaged over 30 days.
	Increased pressure on the road network	Monitor and control through traffic management plan	Cessation of alluvial diamond prospecting.	Impact avoidance through management actions.
Maintenance and aftercare	Revegetation with indigenous species	N/A	Cessation of alluvial diamond prospecting.	N/A
	Restoring of faunal habitat	N/A	Cessation of alluvial diamond prospecting.	N/A
	Visual intrusions removed and restoring of sense of place	N/A	Cessation of alluvial diamond prospecting.	N/A

**i) Financial Provision**

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

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

The applicant, Highlands Farm Trust will be using mobile infrastructure for their prospecting and processing activities, and therefore there would be no need to demolish or break down any infrastructure at closure. The areas disturbed as a result of the prospecting operation will be rehabilitated to the topography, biodiversity and ecological state of the areas near the bulk sampling sites, which will be an improvement of the current state of the areas which is already transformed by previous mining operations. The closure objectives aim to return the affected area to a land use condition as near as possible to the surrounding area. Closure and rehabilitation of excavations will be undertaken during the operational phase. When the activities are completed in a trench, it will already be backfilled and levelled with material taken from the next trench in a roll-over rehabilitation process, to achieve a desired land condition as soon as possible. At the end of the project life cycle, whatever topsoil that the contractor could retrieve, will be spread across the disturbed areas. Thereafter the soil will be ripped to alleviate compaction, fertilised and revegetated. Post-closure monitoring will assist in determining the success of the rehabilitation and establish if the rehabilitation was successful and if additional measures are necessary to restore the area to an acceptable condition.

Rehabilitation measures and objectives will be undertaken in compliance with legislation and policy governing the requirements for rehabilitation such as the National Environmental Management Act 107 of 1998 and the Mineral and Petroleum Resources Development Act 28 of 2002.

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

This EMPr highlights the rehabilitation and management objectives with regards to mitigation of negative environmental impacts associated with the proposed mining operation. The environmental objectives related to the closure of the mining operation contained in this EMPr and EIAR are being subjected to a 30-day review period by Interested and Affected Parties.

**(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.**

The rehabilitation plan for the proposed prospecting operation aims to mitigate the negative impacts associated with the mining activities and to return the transformed land to an acceptable land use standard. The objectives of the plan are to ensure that the condition of the site post- closure will be acceptable and in agreement with the landowner and the competent authority, that there is minimal loss of biodiversity in the area and that rehabilitation restores the land capability from wilderness to grazing capability.

The rehabilitation process will commence during the prospecting operation throughout the life of the project. When the activities are completed in a trench, it will already be backfilled and levelled with material taken from the next trench in a roll-over rehabilitation process, to achieve a desired land condition as soon as possible. Thereafter the final rehabilitation will be undertaken during the mine closure phase. A more detailed closure plan will be developed during the life of the project, prior to the cessation of prospecting activities, adapted to the developed information and environmental impact status of the project to achieve a site-specific closure plan.

Appendix 4 shows an anticipated site layout and aerial extent of the proposed prospecting activities, depicting the anticipated bulk sampling area at the time of closure. The entire 0.5 ha area will be rehabilitated post closure.

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

The Rehabilitation Plan for this project will allow the proposed prospecting operation to achieve the following objectives:

- Comply with relevant legislation and policy requirements with regards to mine rehabilitation.
- Avoid or mitigate impacts which may be harmful to the environment.
- Land rehabilitation to an agreed upon state which will be better than the condition of the site prior to this operation, that will allow sustainable land use and capability.
- Cost effective and efficient closure of mining operations.
- Management and monitoring of the area post closure.

The rehabilitation plan will thus be aligned to the closure objectives and tailored to the project to achieve these objectives. It will include information about the site prior to the prospecting operation and provide information on the maintenance of resources required for the rehabilitation process, as well as detail on how rehabilitation will be undertaken. It will also provide information on the management and monitoring of disturbance to avoid or minimise detrimental impacts, as well as an estimate of the financial closure provision. It will also include information associated with post-closure environmental monitoring of the site to ensure that the rehabilitation plan is followed, and its objectives are achieved.

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

This amount was calculated according to the guideline for the Calculation of the Quantum for rehabilitation as provided by DMR. The mining operation will entail the excavation of trenches in phases, where after processing each trench will be closed and rehabilitated before a new trench will be excavated within the 980-ha area. A total of 10 trenches will be excavated during phase 4 of the prospecting process. No more than one trench of 30m X 10m will have to be rehabilitated by the end of the operation which covers a total of 300m<sup>2</sup> or 0.03 ha. Small areas of disturbance around the trenches is not anticipated to be more than 0.04 ha which bring the total area still to be rehabilitated to 0.07 ha.

At the time of closure, the applicant needs to fence the small slimes area which is not dried out and stabilised since all excavations will be closed. This area will need less than 100m of fencing.

The total disturbed area plus a buffer zone around it that had to be monitored and maintained for two to three years will be no more than 2.5 ha.

**Notes with regards to the calculation of the quantum below:**

- Since this proposed project will be using mobile and temporary structures, the cost of rehabilitating, demolishing and removal of permanent structures does not apply. This ensures that the rehabilitation costs will be kept relatively low compared to other mining endeavours.

**Refer to the table below for the Calculated Quantum of the Financial Provision required for Rehabilitation.**



Applicant: **Highlands Farm Trust**  
 Evaluators: **M. Pienaar**

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	14,71	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	204,96	1	1	0
2 (B)	Demolition of reinforced concrete buildings and structures	m2	0	302,05	1	1	0
3	Rehabilitation of access roads	m2	400	36,68	1	1	14672
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	355,99	1	1	0
4 (B)	Demolition and rehabilitation of non-electrified railway lines	m	0	194,18	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	408,93	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0,07	214 888,54	1	1	15042,1978
7	Sealing of shafts adits and inclines	m3	0	110,03	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	143 259,03	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0,000325	178 426,53	1	1	57,98862225
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	518 235,21	1	1	0
9	Rehabilitation of subsided areas	ha	0	119 957,86	1	1	0
10	General surface rehabilitation	ha		113 485,31	1	1	0
11	River diversions	ha	0	113 485,31	1	1	0
12	Fencing	m	100	126,45	1	1	12645
13	Water management	ha	0	43 150,31	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	2,5	15 102,61	1	1	37756,525
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
<b>Sub Total 1</b>							<b>80173,71142</b>
1	Preliminary and General		9620,845371		<b>weighting factor 2</b>		9620,845371
					1		
2	Contingencies				8017,371142		8017,371142
<b>Subtotal 2</b>							<b>97811,93</b>
<b>VAT (15%)</b>							<b>14671,79</b>
<b>Grand Total</b>							<b>112484</b>





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

Highlands Farm Trust confirms that the financial provision will be provided as determined.



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

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

<b>SOURCE ACTIVITY</b>	<b>IMPACTS REQUIRING MONITORING PROGRAMMES</b>	<b>FUNCTIONAL REQUIREMENTS FOR MONITORING</b>	<b>ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)</b>	<b>MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS</b>
Mining: Construction and Operational Phase	Impacts on soil, air, water, biodiversity, land capability and social impacts	Conduct regular internal audits and inspections of the mining operation and assess against mine permit, Environmental Authorisation and EMPr conditions. Yearly audits and mine performance assessment reports	Applicant and ECO	Monitoring should be undertaken for duration of operations and after completion of each phase. Internal audits and inspections should be undertaken at least monthly. External audits and annual performance report should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the Competent Authority if required.
Mining: Closure and Rehabilitation Phase	Impacts on soil, air, water, biodiversity, land capability and social impacts	Conduct regular internal audits and inspections of the mining operation and assess against mine permit, Environmental Authorisation and EMPr conditions. Yearly audits and mine performance assessment reports	Applicant and ECO	Monitoring should be undertaken for duration of operations and after completion of each phase. Internal audits and inspections should be undertaken at least monthly. External audits and annual performance report should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the Competent Authority if required.
Post – Closure Phase	Impacts on soil, air, water, biodiversity and land capability.	Conduct annual inspections and assess against mine permit, Environmental Authorisation and EMPr conditions.	Applicant	External audits and annual performance report should be undertaken by a suitably qualified auditor on an annual basis. Reports should be available.



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

External audits and annual performance report should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the Competent Authority if required.

**m) Environmental Awareness Plan**

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

For the purposes of the Environmental Awareness Plan the generic roles that need to be defined are those of the:

- Project developer (applicant);
- Environmental Control Officer (ECO);
- Environmental Health and Safety (EHS) Manager; and
- Construction Manager.

Environmental awareness of employees will be provided by implementing environmental awareness training as follows:

- Monthly meetings;
- Environmental Management Programme Training (bi – annually); and
- Induction courses.

The Environmental Awareness Plan should be revised regularly to ensure that relevant environmental concerns are discussed and that the potential impacts of such concerns are minimised. It is the duty of the ECO to implement the Environmental Awareness Plan.

**Monthly meetings**

Monthly meetings are ideal to facilitate awareness of job specific environmental dangers. During these meetings, the following topics will be discussed:

- How the incident occurred;
- Why the incident occurred;
- How the incident was dealt with;
- Can the response undertaken be improved;
- What preventative measures should be implemented; and
- What can be done to reduce the probability of the incident recurring.

**Environmental Management Programme Training**

Twice a year, aspects of the EMP will be selected to form part of a half days training workshop. Examples of topics that may be included in the EMP training include:

- Clean up of oil spills;

- Water conservation
- The importance of alien vegetation removal;
- Concurrent rehabilitation;
- Training on fire hazards; and
- Crime and trespassing.

### **Induction Training**

All new employees will undergo an induction course when they are appointed. Environmental awareness forms part of this induction course.

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

The prospecting operation will implement an incident reporting procedure in order to identify risks timeously and implement actions to avoid or minimise environmental impacts.

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

Financial provision will be reviewed annually. No other specific information requirements have been detailed by the Competent Authority.

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

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Signature of the environmental assessment practitioner

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Name of company

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Date

**-END-**