



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT & ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

Environmental Authorisation Application of Mr Petrus Van Der Walt Vermeulen for the proposed Prospecting Right for the prospecting of Diamonds Alluvial (DA), Diamonds General (D), Diamonds in Kimberlite (DK) and Diamonds (DIA) including associated infrastructure, structure and earthworks on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD.

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PROJECT INFORMATION

Project Name: Application for an Environmental Authorisation for the proposed Prospecting Right application without bulk sampling for the prospecting of Diamond (Alluvial), Diamond (General), Diamonds (Kimberlite) & Diamonds (DIA) including associated infrastructure on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD.

Report Title: Basic Assessment Report & Environmental Management Programme

Prepared By: Milnex CC

Date: 07/10/2022

QUALITY CONTROL:

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Signature:

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The Public Participation Process (PPP) must follow Regulation 41 of NEMA EIA Regulations; thus, the process needs to be transparent. However, due to the Protection of Personal Information Act (POPI Act) which commenced on 01 July 2021, Stakeholders, Landowners, surrounding landowners and registered I&AP' addresses, contact details and comments will not be included in any draft report to be circulated. All this information will form part of the final report to be submitted to the Competent Authority only.

Should you be identified as a Stakeholder, Landowner, Surrounding landowner and you do not wish to receive any further communicate from Milnex CC regarding the application in question, you may request in writing that your details be removed from the Milnex CC database for this application.

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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 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.

BASIC ASSESSMENT REPORT PROCESS

- 1) The environmental outcomes, impacts and residual risks of the proposed activity must be set out in the basic assessment report.

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

SCOPING OF ASSESSMENT AND CONTENT OF BASIC ASSESSMENT REPORT

A) DETAILS OF:

i) THE EAP WHO PREPARED THE REPORT

ii) EXPERTISE OF THE EAP

Name of Practitioner	Qualifications	Contact details
Christiaan Baron	Master's Degree in Environmental Management (refer to Appendix 1) Registered EAP (EAPASA) Reg No: 2020/2639	Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: christiaan@milnex-sa.co.za

Contact details of Milnex CC	Qualifications	Contact details
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Andile Nxumalo	Honours Degree in Environmental Science (refer to Appendix 1)	Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: andile.grant@milnex-sa.co.za

Summary of the EAP's past experience. (Attach the EAP's curriculum vitae as **Appendix 2**)

Milnex CC was contracted by **Mr Petrus Van Der Walt Vermeulen** as the independent environmental consultant to undertake the BAR and EMP process for the proposed Prospecting Right application without bulk sampling for the prospecting of Diamond (Alluvial), Diamond (General), Diamonds (Kimberlite) & Diamonds (DIA) including associated infrastructure on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD. The property is located approximately 28km West of Hopetown in the Northern Cape Province. Milnex CC does not have any interest in secondary developments that may arise out of the authorisation of the proposed project

Milnex CC is a specialist environmental consultancy with extensive consulting experience in the mining industry which provides a holistic environmental management service, including environmental assessment and planning to ensure compliance with relevant environmental legislation. Milnex CC benefits from the pooled resources, diverse skills and experience in the environmental and mining field held by its team that has been actively involved in undertaking environmental studies for a wide variety of mining related projects throughout South Africa. The Milnex CC team has considerable experience in environmental impact assessment and environmental management, especially in the mining industry.

Christiaan Baron & Lizanne Esterhuizen have extensive consulting experience in the Environmental Field. Their key focus is on environmental assessment, advice and management and ensuring compliance to legislation and guidelines. They are currently involved in undertaking EIAs for several projects across the country (refer to **Appendix 2** for CV)

B) DESCRIPTION OF THE PROPERTY.

Farm Name:	Portion 3 of the farm Deelfontein 237 Registration division: Hopetown RD Extent: 2291.7235 hectares Title Deed: T59016/2001CTN Province: Northern Cape
Application area (Ha)	2291.7235 hectares
Magisterial district:	Pixley Ka Seme District Municipality
Local Municipality	Thembelihle Local Municipality
Registration Division	Hopetown
Distance and direction from nearest town	The property is located approximately 28km West of Hopetown in the Northern Cape Province.
21 digit Surveyor General Code for each farm portion	C03300000000023700003
Minerals Applied for	Diamond (Alluvial) Diamond (General) Diamonds (Kimberlite) Diamonds

III. FARM CO-ORDINATES

Farm	Longitude	Latitude
Portion 3 of the farm Deelfontein 237 Registration division: Hopetown RD	23° 50' 2.437" E	29° 28' 34.207" S
	23° 50' 42.941" E	29° 28' 9.987" S
	23° 51' 51.331" E	29° 27' 17.268" S
	23° 52' 13.071" E	29° 27' 27.650" S
	23° 52' 15.851" E	29° 27' 28.983" S
	23° 53' 6.067" E	29° 27' 48.914" S
	23° 53' 52.479" E	29° 27' 19.950" S
	23° 53' 52.020" E	29° 25' 46.948" S
	23° 53' 55.565" E	29° 25' 46.094" S
	23° 54' 36.865" E	29° 25' 38.551" S
	23° 54' 54.342" E	29° 25' 36.999" S
	23° 55' 9.870" E	29° 25' 38.580" S
	23° 55' 14.965" E	29° 25' 40.044" S
	23° 55' 22.075" E	29° 25' 42.085" S
	23° 55' 21.184" E	29° 25' 43.277" S
	23° 55' 19.304" E	29° 25' 46.775" S
	23° 55' 17.601" E	29° 25' 49.711" S
	23° 55' 16.259" E	29° 25' 51.381" S
	23° 55' 14.193" E	29° 25' 55.724" S
	23° 55' 13.104" E	29° 25' 59.807" S
23° 55' 10.727" E	29° 26' 3.719" S	
23° 55' 9.171" E	29° 26' 7.189" S	
23° 55' 5.613" E	29° 26' 12.774" S	
23° 55' 2.709" E	29° 26' 18.090" S	
23° 55' 0.788" E	29° 26' 23.003" S	

	23° 54' 58.481" E	29° 26' 30.032" S
	23° 54' 56.992" E	29° 26' 36.796" S
	23° 54' 56.509" E	29° 26' 42.307" S
	23° 54' 56.709" E	29° 26' 46.560" S
	23° 54' 57.253" E	29° 26' 50.111" S
	23° 54' 58.909" E	29° 26' 54.396" S
	23° 54' 59.001" E	29° 26' 56.805" S
	23° 54' 58.713" E	29° 27' 1.188" S
	23° 54' 57.653" E	29° 27' 5.191" S
	23° 54' 56.867" E	29° 27' 9.948" S
	23° 54' 56.972" E	29° 27' 15.670" S
	23° 54' 58.075" E	29° 27' 20.468" S
	23° 54' 59.540" E	29° 27' 25.842" S
	23° 55' 0.790" E	29° 27' 29.309" S
	23° 55' 1.546" E	29° 27' 33.060" S
	23° 55' 2.228" E	29° 27' 35.628" S
	23° 55' 3.523" E	29° 27' 37.547" S
	23° 55' 5.827" E	29° 27' 40.056" S
	23° 55' 10.835" E	29° 27' 44.327" S
	23° 55' 16.983" E	29° 27' 49.437" S
	23° 55' 11.479" E	29° 27' 51.806" S
	23° 54' 6.643" E	29° 28' 19.701" S
	23° 52' 19.682" E	29° 29' 5.696" S
	23° 51' 35.443" E	29° 29' 52.774" S
	23° 50' 48.940" E	29° 29' 10.248" S

C. LOCALITY MAP (show nearest town, scale not smaller than 1:250000 attached as **Appendix 3**).

A Locality map is attached in **Appendix 3** and on figure 1 below.

D. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY.

i) LISTED AND SPECIFIED ACTIVITIES

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 324, GNR 325 or GNR 326)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
Prospecting near watercourse Drilling It is estimated that 200 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm. Pitting 50 pits: 3m (length) x 2m (breadth) x 4m (depth). Listing Notice 1: GNR 327, Activity 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from: i) a watercourse;	Extent of the proposed portions are 2291.7235 Ha Concurrent backfilling will take place in order to rehabilitate.	X	GNR. 327, Listing Notice 1, Activity 19	
Prospecting Right without bulk sampling: Drilling It is estimated that 200 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm. Pitting 50 pits: 3m (length) x 2m (breadth) x 4m (depth). Listing Notice 1: GNR 327, Activity 20: "Any activity including the operation of that activity which requires a prospecting right in erms of section 16 of the Mineral and	Extent of the proposed portions are 2291.7235 Ha Concurrent backfilling will take place in order to rehabilitate.	X	GNR. 327, Listing Notice 1, Activity 20	-

<p>Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource[.] ; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;</p>				
<p>Clearance of indigenous vegetation:</p> <p>Drilling It is estimated that 200 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm.</p> <p>Pitting 50 pits: 3m (length) x 2m (breadth) x 4m (depth).</p> <p>Listing Notice 1: GNR 327, Activity 27: "The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation."</p>	<p>Extent of the proposed portions are 2291.7235 Ha</p> <p>Concurrent backfilling will take place in order to rehabilitate.</p>	<p>X</p>	<p>GNR. 327, Listing Notice 1, Activity 27</p>	<p>-</p>
<p>Clearance of indigenous vegetation:</p> <p>Drilling It is estimated that 200 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm.</p> <p>Pitting 50 pits: 3m (length) x 2m (breadth) x 4m (depth).</p> <p>Listing Notice 3: GNR 324, Activity 12: "The clearance of an area of 300 square metres or more of indigenous vegetation. (g) Northern Cape (ii) Within critical biodiversity areas identified in bioregional plans;"</p>	<p>Extent of the proposed portions are 2291.7235 Ha</p> <p>Concurrent backfilling will take place in order to rehabilitate.</p>	<p>X</p>	<p>GNR. 324, Listing Notice 3, Activity 12</p>	

Listed activities

<p>Description of the overall activity. (Indicate Mining Right, Mining Permit, Prospecting right, Bulk Sampling, Production Right, Exploration Right, Reconnaissance permit, Technical co-operation permit, Additional listed activity)</p>	<ol style="list-style-type: none"> 1) Listing Notice 1 (GNR 327), Activity 19: <i>“The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from: <ol style="list-style-type: none"> i) a watercourse;” </i> 1) Listing Notice 1 (GNR 327), Activity 20: <i>“Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— <ol style="list-style-type: none"> (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource[.]; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; </i> 2) Listing Notice 1 (GNR 327), Activity 27: <i>“The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.”</i> 3) Listing Notice 3 (GNR 324), Activity 12: <i>“The clearance of an area of 300 square metres or more of indigenous vegetation. (g) Northern Cape: (ii) Within critical biodiversity areas identified in bioregional plans;</i> <p>Prospecting right without bulk sampling for the prospecting of Diamonds Alluvial (DA), Diamonds General (D), Diamonds in Kimberlite (DK) and Diamonds (DIA) including associated infrastructure, structure and earthworks. Application of Prospecting right without bulk sampling.</p>
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ii) DESCRIPTION OF THE ASSOCIATED STRUCTURES AND INFRASTRUCTURE RELATED TO THE DEVELOPMENT

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

Mr Petrus Van Der Walt Vermeulen has embarked on a process for applying for a Prospecting Right without bulk sampling for the prospecting of Diamond (Alluvial), Diamond (General), Diamonds & Diamonds (Kimberlite) on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD. This portions is preferred due to the sites expected mineral resources, and because the farm is owned by the Deelfontein trust, of which the applicant is the trustee. **Mr Petrus Van Der Walt Vermeulen** requires a prospecting right without bulk sampling in terms of NEMA and the Mineral and Petroleum Resources Development Act to prospect for minerals mentioned above within the Thembelihle Local Municipality, Northern Cape Province (refer to a locality map attached in **Appendix 3**).

Access road

Access will be obtained from existing gravel roads off the R3112 that traverses the area

Water Supply

This is a prospecting right application without bulk sampling. It is envisaged that small amounts of water will be utilized to be used as dust suppression & for the cooling of equipment

If Water uses under section 21 a-k of the NWA are triggered, a Water Use Licence Application (WULA) must be lodged with the department of Water & Sanitation (DWS).

Ablution

Chemical toilets shall be used, no french drains and pits shall be permitted.

Storage of dangerous goods

During the prospecting activities, limited quantities of diesel and fuel, oil and lubricants if any will be stored on site. These goods should be placed in a bunded area one and a half times the volume of the total amount of goods to be stored. Less than 30 cubic metres of dangerous good will be stored on site.

-List of equipment's & infrastructure

List of equipment
1 X 400 Kva John Dere Generator
1 x 500 Kva Volvo Generator
1 x 933 Lui Gong Excavators
Volvo drilling machine

Prospecting activities and phases

Please find the Prospecting Work Programme attached as **Appendix 8**.

iii) DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES:

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

Site Visit (Phase 1)

The applicant will appoint Pierre de Jager as geologist to conduct the site visit with him. It is foreseen that more than one site visit will be conducted. The purpose of the site visit shall be to familiarize the parties of the area including the topography and the general geology before invasive prospecting activities shall be commenced with.

During the site visit, the applicant shall assess the roads, the infrastructure that may be used and if it will be necessary to construct any infrastructure needed for the prospecting activities. From a site visit much more details shall be obtained about the process to be followed to properly conduct the prospecting activities than from near desktop studies.

Site visit shall assist the applicant to make a better assessment of the prospecting work to be done during the respective phases where the prospecting work shall be commenced with and what additional equipment may be required to properly conduct the prospecting activities.

The site visit shall also assist the applicant to assess prospecting information of earlier prospecting activities. During this process the applicant shall also review all documentation that has received in relation to the geology of the area.

A site visit will be done within 90 days after the prospecting right was executed.

Desktop Studies (Phase 2)

Desktops studies would be undertaken after the site visit has been done to determine the target areas including the identification of any infrastructure to be built and any potential problems that may need to be addressed during the prospecting activities.

Both these two phases will be Non-Invasive and restricted to a desktop study which will include literature survey, Interpretation of aerial photographs, satellite images and ground validation of targets.

During the desktop studies the applicant with the appointed geologist shall study all available geological information and historical data about the previous prospecting and mining activities.

During desktop studies, a preliminary analysis of the operating environment shall be obtained. The desktop studies may improve in project efficiency and reduced the cost by providing a clearer understanding of the challenges the prospecting activities may entail.

The desktop studies shall be finalized by the compilation and the analysis of pre-existing relevant data. The preliminary operating areas shall be identified for these studies. A working document shall be drafted by the geologist after the finalization of the desktop studies.

Consolidation and interpretation of results data (Phase 5)

The project geologist, Pierre de Jager, shall monitor the program and consolidate and process the data and amend the program depending on the results received after each phase of prospecting. The DMR shall be updated of any amendments made. This shall be a continuous process throughout the prospecting work program.

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

A GIS data base will be constructed capturing all the exploration data. All data shall be consolidated and processed to determine the diamond bearing resource on the property.

iv) DESCRIPTION OF PLANNED INVASIVE ACTIVITIES:

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

Drilling (Phase 3)

The applicant has appointed Pierre de Jager representative of the mineral consultants and as appointed geologist who will assist with the prospecting activities.

It is estimated that 200 boreholes shall be drilled by the appointed contractor. Percussion drilling methods will be used to drill boreholes at varying depths ranging from 90-150m with hole diameters of at least 150mm. The drilling programme shall be done in accordance with procedures and protocols drawn up by the appointed geologist. Drilling shall be carried out by using a Volvo drilling machine. The drill will be under constant observation to determine the depth estimates of the lithological contacts. Each sample shall be logged based upon macroscopic examination of the drill cuttings.

Drilling will commence on the areas that the geologist is of the opinion the geology may prove the presence of diamond bearing indicators. The holes will be drilled on a 100m by 100m grid on the target areas identified during phase 1 and phase 2.

The results shall be noted in a field note book. Observations in the field shall include grainsize, color, degree of roundness (quartzite and chert clasts) and end-of-hole lithology bedrock. These logs will later be summarized and the gravel deposit types will be assigned based upon their stratigraphic and sedimentological characteristics. All the drill holes positions will be surveyed and each borehole will be rehabilitated after completion of drilling.

It is estimated that the drilling will take approximately two years after the prospecting right has been executed and the EMP approved.

Calculations

According to the PWP the diameter of the borehole will be 150mm and 200 boreholes will be drilled. The disturbance of each borehole was calculated at 2m x 2m.

• $2m \times 2m = 4m^2$	(From mm to m)
• $4m^2 \times 200 \text{ boreholes} = 800m^2$	(Total area disturbance for all boreholes)

• $800\text{m}^2 / 10\,000 = 0.08\text{ha}$	(Disturbance from m^2 to ha)
• $0.08\text{ha} / 2\text{ years} = 0.04\text{ha}$	Disturbance per year (12 months)

The total vegetation clearance for 200 boreholes is 0.08ha for 24 months and 0.04 for 12 months.

Pitting (Phase 4)

Invasive prospecting pits may be dug, depending on the results obtained from the previous phases if deemed necessary by the appointed geologist.

These pits will be positioned as determined by the geologist and after the geologist has assessed information obtained from the earlier prospecting activities.

A trial pit / test pit or inspection pit investigation is a highly effective way of obtaining data on the sub surface soil and rock conditions which underlie a prospecting sight. It allows for the various soils and rock types to be locked, the soil to be sampled and a preliminary assessment to be made.

Pits shall be dug, locked, sampled and backfilled.

To dig the pits, the applicant shall make use of the systems of the appointed geologist.

The applicant shall at the end of the pitting process have locked the pits with the following information:

- A description of the soil and rock types from ground level to the base of the pits;
- Record of rock head depth and refusal depth, a list of where the samples will be taken, a record of where ground water seepage will be recorded;
- A general note of the geologist and conditions in the vicinity of the test pit.

Calculations

It is planned that 50 pits will be dug (it may be less depending on the results) at an extent of 3m (length) x 2m (breadth) x 4m (depth).

$(50\text{ pits} / 24\text{ months}) \times 12\text{ months} = 25\text{ pits dug per year}$	
$25\text{ pits} \times (3\text{m} \times 2\text{m}) / 10\,000 = 0.015\text{ Ha disturbed per year}$	Total area to be disturbed per year
$50\text{ pits} \times (3\text{m} \times 2\text{m}) / 10\,000 = 0.03\text{ Ha disturbed}$	Total area disturbed for 24 months

Total disturbance for the difference phases:

Phase	Timeframe	Impact
Phase 3 - Drilling		Vegetation disturbance
24 months (months 7 -30)	1 st year: 12 months	0.04ha
	2 nd year: 12 months	0.04ha
Phase 4 - Pitting		Vegetation clearance
24 months (months 30 - 54)	3 rd year: 12 months	0.015ha
	4 th year: 12 months	0.015ha
Total	48 months	0.11ha

- (i) **DESCRIPTION OF PRE-FEASIBILITY STUDIES** (Activities in this section includes but are not limited to: initial, geological modelling, resource determination, possible future funding models, etc.)

All data will be consolidated and processed to determine the diamond bearing resource on the property. This will be a continuous process throughout the prospecting work program.

E. POLICY AND LEGISLATIVE CONTEXT

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act No. 107 of 1998 as amended.	Department of Environmental Affairs	27 November 1998
Constitution of South Africa Act 108 of 1996	National	18 December 1996
The National Heritage Resources Act (Act No. 25 of 1999)	SAHRA	1999
Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	Department of Mineral Resources & Energy (DMRE)	2002
National Infrastructure Plan	National	
National Environmental Management: Biodiversity Act No. 10 of 2004	Department of Environmental Affairs	7 June 2004
National Environmental Management Waste Act, 2008 (Act No. 59 of 2008)	National & Provincial	1 July 2009
EIA regulations under NEMA	Department of Environmental Affairs	14 December 2014
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	Department of Agriculture Forestry and Fisheries	1 June 1984
National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004).	National and Provincial	11 September 2004
National Water Act, 1998 (Act No. 36 of 1998).	National	20 August 1998
Pixley Ka Seme District Municipality Integrated Development Plan (IDP)	Municipal	
Thembelihle Local Municipality Integrated Development Plan (IDP)	Municipal	
National Forest Act (Act 84 of 1998) (NFA)	National	30 October 1998
National Veld & Forest Fires Act (Act 101 of 1998)	National	27 November 1998

POLICY AND LEGISLATIVE CONTEXT

Title of legislation, policy or guideline:	Reference where applied	How does this development comply with and respond to the legislation and policy context.
Constitution of South Africa Act 108 of 1996	Section 24	<p>The Constitution is the supreme law of the Republic and all law and conduct must be consistent with the Constitution. The Chapter on the Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment. Section 24 of the Constitution of the Republic of South Africa (Act 108 of 1996) states the following:</p> <p><i>“Everyone has the right –</i></p> <p><i>(a) to an environment that is not harmful to their health or well-being; and</i></p> <p><i>(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –</i></p> <p><i>i) prevent pollution and ecological degradation;</i></p> <p><i>ii) promote conservation; and</i></p> <p><i>iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</i></p> <p>The Constitution therefore, compels government to give effect to the people’s environmental right and places government under a legal duty to act as a responsible custodian of the countries environment. It compels government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development.</p>
National Environmental Management Act No. 107 of 1998 as amended.	S24(1) of NEMA S28(1) of NEMA	<p>NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information; polluter pays; subsidiary; waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice.</p> <p>The mandate for EIA lays with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 326, 327, 325, and 324 promulgated in terms of Section 24 of NEMA. The EIA Regulations determine that an Environmental Authorisation is required for certain listed activities, which might have a detrimental effect on the environment.</p>
EIA regulations as amended under NEMA	Listing notice 1 Listing notice 2 Listing Notice 3	<p>The National Environmental Management Act 107 of 1998 (NEMA), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment. These activities are detailed in Listing Notice 1 (as amended by GNR 327 of 7 April 2017), Listing Notice 2 (as amended by GNR325 of 7 April 2017) and Listing Notice 3 (as amended by GNR324 of 7 April 2017). Undertaking activities specified in the Listing Notices are only allowed once Environmental Authorisation has been obtained from the competent authority. Such Environmental Authorisation will only be considered once there has been compliance with the EIA Regulations, 2014. The Environmental Authorisation which may be granted subject to conditions.</p>

Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)	Section 10, 16, 22, 27 and 48	The Minerals and Petroleum Resources Development Act identifies the state as the official custodian of South Africa's Mineral and Petroleum Resources. Therefore, all activities relating to the reconnaissance, prospecting rights, mining rights, mining permits and retention permits are regulated by the State. One of the objectives of the Act is to give effect to section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development.
Mineral and Petroleum Resources Development Regulations, 2014.	Regulations 3, 5, 10 and 14	MPRDA Regulations prescribe how an application for a permit or right must be lodged.
The National Heritage Resources Act (Act No. 25 of 1999)	Section 35 Section 38	The National Heritage Resources Act (Act No 25 of 1999, Section 35) protects South Africa's unique and non-renewable archaeological and palaeontological heritage sites. These sites may not be disturbed without a permit from the relevant heritage resources authority. Section 38 of the NHRA provides guidelines for Cultural Resources Management and proposed developments:
National Environmental Management Waste Act, 2008 (Act No. 59 of 2008)	Category A Category B Category C	<p>Section 24S of NEMA deals with the management of residue stockpiles and residue deposits and provides that Residue stockpiles and residue deposits must be deposited and managed in accordance with the provisions of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), on any site demarcated for that purpose in the environmental management plan or environmental management programme in question.</p> <p>The management of residue stockpiles and residue deposits must be done in accordance with any conditions set out and any identified measures in the environmental authorisation issued in terms of NEMA, an environmental management programme and a waste management licence issued in terms of NEMA (Regulation 3(2)).</p> <p>The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA) regulates waste management in all aspects and created a list of waste management activities that have, or are likely to have, a detrimental effect on the environment, which requires an impact assessment and licensing process. Activities listed in Category A require a Basic Assessment process, activities listed in Category B require a Scoping and EIA process and activities under Category C must comply with the relevant requirements or standards, in order for competent authorities to consider an application in terms of NEM:WA.</p>
National Environmental Management: Biodiversity Act No. 10 of 2004	Chapter 4 Chapter 5	<p>The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is part of a suite of legislation falling under NEMA. The Act provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant protection; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith (SANBI).</p> <p>Chapter 4 of NEMBA deals with threatened and protected ecosystems and species to ensure the maintenance of their ecological integrity, their survival in the wild, the utilisation of biodiversity is managed in an ecologically sustainable way and to regulate international trade in specimens of endangered species. Chapter 5 of NEMA deals with species and organisms posing potential threats to biodiversity. The purpose of this chapter is</p>

		<p>to prevent the introduction and spread of alien species and invasive species, also to manage, control and eradicate alien species and invasive species</p>
<p>National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004).</p>	<p>Section 21</p>	<p>The object of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development.</p> <p>Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1) (a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed development.</p>
<p>National Water Act, 1998 (Act No. 36 of 1998).</p>	<p>Section 21</p>	<p>Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. The intention of the Act is to promote the equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply and sanitation, and environmentally, it provides for the protection of aquatic and associated ecosystems, the reduction and prevention of pollution and degradation of water resources.</p> <p>As this Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, a person can only be entitled to use water if the use is permissible under the Act. Chapter 4 of the Act lays the basis for regulating water use.</p>

National Forest Act (Act 84 of 1998) (NFA)	Regulation 7	<p>The protection, sustainable management and use of forests and trees within South Africa are provided for under the National Forests Act (Act 84 of 1998).</p> <p>Regulation 7 from the Act states the following:</p> <p>Prohibition on destruction of trees in natural forests.</p> <p>(1) No person may -</p> <p>(a) cut, disturb, damage or destroy any indigenous tree in a natural forest; or</p> <p>(b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any tree, or any forest product derived from a tree contemplated in paragraph (a), except in terms of-</p> <p>(i) a licence issued under subsection (4) or section 23; or</p> <p>(ii) an exemption from the provisions of this subsection published by the Minister in the Gazette on the advice of the Council.</p>
National Veld & Forest Fires Act (Act 101 of 1998)	Regulation 13 Chapter 5	<p>The purpose of the Act is to prevent and combat veld, forest and mountain fires throughout the Republic and provides for a variety of institutions, methods and practices for achieving the purpose. Regulations 13 provides the requirement for firebreaks. Chapter 5 places a duty on all owners to acquire equipment and have available personnel to fight fires.</p>
Conservation of Agricultural Resources Act (Act No. 85 of 1983)		<p>The purpose of the Act is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.</p> <p>The objects of this Act are to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants.</p>
National Infrastructure Plan		<p>The National Government adopted a National Infrastructure Plan in 2012. With the plan they aim to transform the South African economic landscape while simultaneously creating significant numbers of new jobs, and strengthening the delivery of basic services.</p> <p>Government will over the three years from 2013/14 invest R827 billion in building and upgrading existing infrastructure.</p> <p>These investments will improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. On the other hand, investments in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to faster economic growth.</p> <p>This mining activity will indirectly contribute to the growing of the South African economy by supplying SANRAL with material to build and upgrade road infrastructure.</p>

District Municipality Integrated Development Plan (IDP)		The IDP and SDFs of the relevant municipalities was examined and relevant information was included in the EIA report.
Local Municipality Integrated Development Plan (IDP)		The IDP and SDFs of the relevant municipalities was examined and relevant information was included in the EIA report.
National Environmental Management: Protected Areas Act 57 of 2003		This Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. It also seeks to provide for the sustainable utilization of protected areas and to promote participation of local communities in the management of protected areas.
National Environmental Management: Waste Act, 2008 (Act No. 59 Of 2008) Regulations regarding the Planning & Management of Residue Stockpiles & Residue Deposits from a Prospecting, Mining, Exploration or Production Operation		The purpose of these Regulations is to regulate the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration or production operation.
Hazardous Substances Act (No. 15 of 1979)		The object of the Act is inter alia to 'provide for the control of substances which may cause injury or ill health to, or death of, human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature or the generation of pressure thereby in certain circumstances; for the control of electronic products; for the division of such substances or products into groups in relation to the degree of danger; for the prohibition and control of such substances.' In terms of the Act, substances are divided into schedules, based on their relative degree of toxicity, and the Act provides for the control of importation, manufacture, sale, use, operation, application, modification, disposal and dumping of substances in each schedule.
Subdivision of Agricultural Land Act (No. 70 of 1970)		This Act regulates the subdivision of agricultural land and its use for purposes other than agriculture. The Directorate of Resource Conservation is responsible for the enforcement thereof. Investigations are done by the Provincial Department in support of the execution of the Act. The Act also deals with aspects associated with rezoning land.
Occupational Health and Safety Act (No. 85 of 1993)		The Occupational Health and Safety Act (No. 85 of 1993) (OHSA) provides a legislative framework for the provision of reasonably healthy and safe conditions in the workplace. It also places extensive legal duties on employees and users of machinery and makes major inroads on employers' and employees' common law rights. The OHSA is applicable and states that any person involved with construction, upgrades or developments for use at work or on any premises shall ensure as far as reasonably practicable that nothing about the manner in which it is installed, erected or constructed makes it unsafe or creates a risk to health when properly used

<p>Mine Health and Safety Act (No. 29 of 1996)</p>	<p>The Mine Health and Safety Act (No. 29 of 1996) (MHSA) aims to protect and promote the health and safety of employees and persons that may be affected by the activities at a mine and outlines both the rights and responsibilities of an employer, as well as the obligations of employees working thereat.</p> <p>The following principles are considered applicable to the Proposed Project and are detailed below:</p> <ul style="list-style-type: none"> • The primary responsibility for ensuring a health and safe working environment in the mining site is placed on the mine owner. The Act sets out in detail the steps that employers must take to identify, assess records and control health and safety hazards in the mine; • The right of workers to participate in health and safety decisions, the right to receive health and safety information, the right to training and the right to withdraw from the workplace in face of danger; • The Act requires the establishment of institutions to promote a culture of health and safety and develop policy, legislation and regulations; and • The responsibility for enforcing MHSA lies with the Mine Health and Safety Inspectorate. The Inspectorate's powers are recast and include the power to impose administrative fines upon employers who contravene the MHSA. <p>The Act also contains innovative approaches to the investigation of accidents, diseases and other occurrences that threaten health and safety.</p>
<p>Government Notice Regulation 704 of 1999</p>	<p>GNR.704 of 1999 under the NWA provides regulations on the use of water for mining and related activities aimed at the protection of water resources (requirements for clean and dirty water separation). GNR.704 requires inter alia the following:</p> <ul style="list-style-type: none"> • Separation of clean (unpolluted) water from dirty water; • Collection and confinement of the water arising within any dirty area into a dirty water system; • Design, construction, maintenance and operation of the clean water and dirty water management systems so that it is not likely for either system to spill into the other more than once in 50 years; • Design, construction, maintenance and operation of any dam that forms part of a dirty water system to have a minimum freeboard of 0.8m above full supply level, unless otherwise specified in terms of Chapter 12 of the Act; and • Design, construction, and maintenance of all water systems in such a manner as to guarantee the serviceability of such conveyances for flows up to and including those arising as a result of the maximum flood with an average period of recurrence of once in 50 years. <p><u>GNR.704 also stipulates that no person in control of a mine or activity may:</u></p> <p>Locate or place any residue deposit, dam, reservoir, together with any associated structure or any other facility within the 1:100 year flood line or within a horizontal distance of 100 m from any watercourse or estuary, borehole or well, excluding boreholes or wells drilled specifically to monitor the pollution of groundwater, or on water-logged ground, or on ground likely to become water-logged, undermined, unstable or cracked;</p> <p>Place or dispose of any residue or substance which causes or is likely to cause pollution of a water resource, in the workings of any underground or opencast mine excavation, prospecting diggings, pit or any other excavation; or</p>

Milnex CC: BAR262PR – BAR & EMP: Environmental Authorisation Application of Mr Petrus Van Der Walt Vermeulen for the proposed Prospecting Right for the prospecting of Diamonds Alluvial (DA), Diamonds General (D), Diamonds in Kimberlite (DK) and Diamonds (DIA) including associated infrastructure, structure and earthworks on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD.

		Use any area or locate any sanitary convenience, fuel depots, reservoir or depots for any substance which causes or is likely to cause pollution of a water resource within the 1:50 year flood line of any watercourse or estuary.
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F. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

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

Economic activity in modern-day South Africa has been centered on mining activities, their ancillary services and supplies. The country's stock exchange in Johannesburg was established in 1887, a decade after the first diamonds were discovered on the banks of the Orange River, and almost simultaneously with the gold rush on the world-famous Witwatersrand.

In many ways, South Africa's political, social and economic landscape has been dominated by mining, given that, for so many years, the sector has been the mainstay of the South African economy. Although gold, diamonds, platinum and coal are the most well-known among the minerals and metals mined, South Africa also hosts chrome, vanadium, titanium and a number of other lesser minerals.

In 2018 the mining sector contributed R351 billion to the South African gross domestic product (GDP). A total of 456,438 people were employed in the mining sector in 2018. Each person employed in the mining sector has up to nine indirect dependents. The mining sector has, for many years, attracted valuable foreign direct investment to South Africa. (Mineral Council, 2021)

Diamonds, arguably the ultimate luxury mineral, comprise an intricate lattice of carbon atoms, a crystalline structure that makes them harder than any other form in nature. This characteristic makes diamonds not only popular in jewellery, but also desirable in high-tech cutting, grinding and polishing tools (Chamber of Mines, South Africa, 12:2016).

According to the Chamber of Mines the country's diamond sector is far from reaching the end of its life even though diamond mining has been taking place in South Africa for almost a century and a half. The primary sources of all of South Africa's diamonds are kimberlites in ancient, vertically dipping volcanic pipes most of which were located in the vicinity of the city of Kimberley and which were initially amenable to open-cast.

Economic growth - South Africa's total reserves remain some of the world's most valuable, with an estimated worth of R20.3-trillion. Overall, the country is estimated to have the world's fifth-largest mining sector in terms of GDP value.

With South Africa's economy built on gold and diamond mining, the sector is an important foreign exchange earner, with gold accounting for more than one-third of exports. In 2009, the country's diamond industry was the fourth largest in the world.

Mining is a cornerstone of the economy, making a significant contribution to economic activity, job creation and foreign exchange earnings. Mining and its related industries are critical to South Africa's socio-economic development.

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.

Location of the site

The property is located approximately 28km West of Hopetown in the Northern Cape Province.

The location of the site is preferred due to the possibility of shallow diamond. The property is also owned by the Deelfontein Trust of which Mr Petrus Van Der Walt is the trustee.

According to **Figure 20 and Figure 21** the proposed area is mostly covered by Low shrubland, Grassland, Ticket/Dense Bush and some bare non vegetated areas. According to the Landcover Map, the area is mostly natural (Figure 20 or 21)

Preferred activity

The prospecting of Diamond (Alluvial), Diamond (General), Diamonds & Diamonds (Kimberlite) is one of the preferred activity for the site. The possible shallow diamond deposits make the site ideal for prospecting. The mine will provide significantly more job opportunities than what is providing currently.

According to **Figure 20 and Figure 21** the proposed area is mostly covered by Low shrubland, Grassland, Ticket/Dense Bush and some bare non vegetated areas. According to the Landcover Map, the area is mostly natural (Figure 20 or 21)

Technology alternatives

In terms of the technologies proposed, these have been chosen based on the long term success of their prospecting history. The prospecting activities proposed in the Prospecting Works Programme (**Appendix 8**) is dependent on the preceding phase as previously discussed, therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

H. A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE, INCLUDING:

i) DETAILS OF THE DEVELOPMENT FOOTPRINT ALTERNATIVES CONSIDERED;

- **Consideration of alternatives**

The DEAT 2006 guidelines on 'assessment of alternatives and impacts' proposes the consideration of four types of alternatives namely, the no-go, site, activity, and technology alternatives. It is however, important to note that the regulation and guidelines specifically state that only 'feasible' and 'reasonable' alternatives should be explored. It also recognizes that the consideration of alternatives is an iterative process of feedback between the developer, the EAP and Interested and affected parties, which in some instances culminates in a single preferred project proposal. The following sections explore each type of alternative in relation to the proposed activity.

- **Location alternatives**

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity. Also, it is expected that the applied for minerals have been deposited on this farm and therefore the applicant would like to commence with their prospecting activities. The property is also owned by the Deelfontein Trust of which Mr Petrus Van Der Walt Vermeulen is a trustee.

According to **Figure 20 and Figure 21** the proposed area is mostly covered by Low shrubland, Grassland, Ticket/Dense Bush and some bare non vegetated areas. According to the Landcover Map, the area is mostly natural (Figure 20 or 21). The property also borders the Orange River on its Eastern boundaries.

Land capability

The proposed development falls within Land in Class VII (7). (refer to Land capability map on **figure 6** and attached as **Appendix 5**).

According to an article on the Grain SA website by Garry Paterson from ARC-Institute for Soil, Climate and Water on the Grain SA website, agriculture rests on three pillars where natural resources are concerned. These are the soil (comprising the growth medium for the plant), the climate conditions (which supply the plant with sufficient water and heat) and the terrain (enabling the crop to be physically planted, to grow and to be harvested sustainably).

The concept of land capability combines the three natural resource elements or factors listed above (soil, climate and terrain) and uses set parameters to determine a specific class for a given area. The basis of the land capability assessment in South Africa is the well-known Land Type Survey, which is a country-wide inventory of natural resources, i.e. soil pattern, macroclimate and terrain type, carried out between 1972 and 2002 by the ARC-Institute for Soil, Climate and Water.

Each unique land type is allocated to one of eight land capability classes. These classes are based on the original USDA land capability system, whereby Classes I and II comprise areas with little or no limitations to rainfed agriculture, Classes III and IV comprise those areas which are still considered arable, but with moderate to severe restrictions. Classes V to VIII comprise non-arable land with increasingly serious restrictions, either in terms of restricted soil, steep terrain, rockiness and/or an unfavourable climatic regime. (Garry Paterson, ARC-Institute for Soil, Climate and Water, November 2014.)

- **Activity alternatives**

The environmental impact assessment process also needs to consider if the development of Diamond (Alluvial), Diamond (General), Diamonds & Diamonds (Kimberlite). prospecting would be the most appropriate land use for the particular site.

Prospecting of other commodities – from the surface and desktop assessment there are no indications that there are other commodities to be mined on the site except Diamond (Alluvial), Diamond (General), Diamonds & Diamonds (Kimberlite).

- **Design and layout alternatives**

The purpose of prospecting it to investigate an area of land to identifying an actual or probable mineral deposit. The location of activities will be determined based on the location of diamondiferous gravel.

All the infrastructure will be temporary and/or mobile.

- **Operational alternatives**

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

The objective of the prospecting work programme is to target all minerals in question seams available with a view of increasing the geological confidence factor to assess its bulk sampling potential.

- **No-go alternative**

This alternative considers the option of 'do nothing' and maintaining the status quo. The description provided in section H of this report could be considered the baseline conditions (status quo) to persist should the no-go alternative be preferred. Should the proposed activity not proceed, the site will remain unchanged.

- **Technology Alternatives**

In terms of the technologies proposed, these have been chosen based on the long term success of their prospecting history. The prospecting activities proposed in the Prospecting Works Programme (**Appendix 8**) is dependent on the preceding phase as previously discussed, therefore no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

The preferred technology for the proposed mining activity, will be to drill boreholes, dig pits, lock, sample and backfill them. Please find the Prospecting Work Programme attached as **Appendix 8**.

Reverse Circulation Drilling (RC drilling)

Drill Structure

RC drilling is usually a large piece of apparatus, that requires a lot of space, not just for the rig itself, but the supporting vehicles and the pit for collecting waste runoff.

The drill cutting is transferred to the surface inside drill rods, which are linked together to create a 'drill string'. Drill bits attached to the end of the hammer are made from tungsten-steel, and are usually around 13-20cm in diameter. These also have metal nodules attached at the end to allow cutting through particularly tough rock. Most RC drilling uses a dual-tube drill rods, with one tube inside another. The tubes inside overlap and provide a path for drilled rock from the ground to the surface. Inner tubes can be sealed together, meaning that the RC drill can sample up to very large depths, often around 500m.

Another type of RC drilling is 'centre sample' drilling. This is a modern variation, in which a central hammer, with a hollow centre, allows the sample to immediately enter the drill pipe, without the need to travel past the hammer (AZOMining, 2012)

Sample Extraction

The samples produced from RC drilling are dry chips of the drilled rock. To create the sample, the hammer acts like a pneumatic piston and pushes a tungsten-steel drill bit on to the rock, breaking it up. Before the drill bit hits the rock, it is dried out using an air compressor, so that the rock chips are dry at the surface.

Water is often used down the hole to cool the drill bit and reduce dust, as well as assisting with the transportation of sample bits to the surface. Air is blown down the drill rods to create a pressure difference, allowing the sample chips and water to rise through the inner tube. The sample then reaches a bell at ground level, which transports the sample to a cyclone where it dries out and is deposited into sacks (AZOMining, 2012).

Applications

RC drilling is a technique used in most stages of mine development.

As it is cheaper than diamond core drilling, it is often used in first stage exploration mining to delineate a potentially extractable ore body. It is also preferable to RAB or air-core drilling when trying to reach great depths, but RC drilling is slower and more expensive than either of these two methods.

RC drilling is also consistently used during in-pit grade control and the development stage of an ore body (AZOMining, 2012).

Pros & Cons of the alternative RC drilling

Advantages	Disadvantages
Direct drilling cost reductions in the range of 25% to 40%.	Less geological information from sample.
Faster completion of drill programs with quicker delivery of results.	Holes can deviate (Spiral Stabiliser Subs keep holes straighter)
Reduced man-hours at the drill with decreased exposure to potential accidents.	Diamond drill can usually drill to greater depth although depths up to 800m have been achieved with.
Reduced contractor activity in the mine reduces mine support burden.	
Indirect cost reductions gained from a simplified sampling process.	

Diamond Core Drilling

Diamond drilling allows the removal of solid cylinders of rock (core) from deep within the earth.

Drill Structure

Diamond core drilling is so called because it uses a 'diamond bit'. This drill bit is composed of group of small, industrial grade diamonds set into a metallic, soft matrix. As the ground is drilled, this matrix will wear away and expose more diamonds.

This is then attached to a drill rod, which is around 10 foot in length, and then more sections of pipe can be attached to the top of this, so a greater depth can be drilled. The depth that is drilled to is estimated by the number of rods attached to the top of the drill rod.

Inside the drill rod, a core tube is attached to a cable via a latching mechanism. The core tube is lifted to the surface using the cable, so the solid core can be removed.

There are two primary types of diamond drilling-rotary drilling and wineline drilling. Rotary drilling is used primarily for bore hole drilling, whereas wineline drilling is used for solid core sampling.

There are five standard tube sizes associated with wire line drilling. These are as follows:

- AQ (Hole diameter: 48mm)
- BQ (60mm)
- NQ (75.5mm)
- HQ (96mm)
- PQ (122.6mm)

The drill size used depends on the desired core diameter and the desired depth of drilling, and the wider the diameter of the tube, the more power that is required to drive the drilling (AZOMining, 2012).

Core Extraction

To extract core, the drill rod rotates the diamond bit, spinning it into the ground. As the drill bit bores through the rock, solid rock is taken into the circular opening at the end of the bit, into the core tube, and can then be recovered at the surface as it piles up. Once the core is recovered at the surface it is broken along natural fractures and stored in core trays to await analysis. A standard core tray can hold around 10 feet of core.

For optimum core extraction, the driller must listen to the drill to evaluate subsurface conditions. To keep drilling efficient, the rotation speed, pressure and water circulation must be strictly monitored.

Sometimes when drilling in highly fractured zones, overheating can occur due to a stuck bit. This issue is usually counteracted by the injection of mud or sawdust to plug fractures in the rock.

Application

Diamond core finds its primary function in the exploration mining sector. It is usually one of the last stages of exploration, during which the orebody is delineated in three dimensions. This will determine whether the prospect is economically viable. Using a diamond drill rig, long vertical sections of core can be extracted from deep in the ground, which can then be analysed at the surface by geologists.

The core can then be analysed using a wide range of petrologic, structural and mineralogical techniques to determine whether the potential mining site is economically viable.

Extracted core is first washed and macroscopic features are logged by an exploration geologist. The core is then cut and representative samples are sent for chemical analysis (AZOMining, 2012).

Pros & Cons of the alternative Diamond Core Drilling

Advantages	Disadvantages
Highly accurate cutting	Drill bits are often not very big and they are mostly able to cut through only stone, rock and cement.
A reduced risk of inadvertently causing structural damage	There is a powerful kick back from the machinery so caution needs to be applied when using diamond core drilling.
Less debris is produced	While dust will not accumulate in large quantities some dust is likely to go into the drilling machine which can have an effect on its functioning and effectiveness.
Suitable for just about any working environment	
Very little noise and no dust	

Equipment is lightweight and portable	
Can be done remotely which limits the safety hazards.	
Drill to great depth	

Percussion rotary air blast (RAB)

Percussion rotary air blast drilling is a commonly used drilling technique used for exploratory drilling i.e. when minerals are being searched for. Percussion rotary air blast drilling is also often used for water bore drilling and blasthole drilling of mines.

This drilling technique makes use of pneumatic pressure to drive the steel drill bit into the ground in order to create a hole. It is a hammer like process that is easily able to penetrate rock in order to find mineral and ore deposits. The drill bits used are hollow. The debris which results from the **drilling process** shoots out of the earth and lands next to the machine. The unwanted material will land on the surface, next to the machine, by the use of air compression that is forced into the mine shaft. This is method of drilling is not always the best method to use when it comes to exploratory drilling as the materials to be sampled can be damaged when the materials are blasted from the earth. The percussion rotary air blast drilling procedure can usually be completed within a day.

Percussion rotary air blast drilling is the perfect method to be used when the exploratory drilling needs to be done on hard material such as rock. The percussion rotary air blast drilling method can penetrate up to 25 metres. If a mining company simply wants to have a small sample of the product which they are mining, then this method is simple and cost effective to be use. When there is a rock layer sitting on top of the soil which needs to be analysed for mineral presence, percussion rotary air blast drilling can be used to break away the top layer of rock so that the underneath soil can be explored.

Pros & Cons of the alternative Percussion rotary air blast (RAB):

Advantages	Disadvantages
Can be completed very quickly and easily through almost every different type of rock, this is the biggest advantage to percussion rotary air blast drilling.	The biggest disadvantages to percussion rotary air blast drilling are that for the effective use of the machinery, an experienced operator needs to be employed and while the machine can break through almost all types of rock, it cannot break through rock which is reinforced by steel.
Simple to operate and maintain	Slow, compared with other methods
Suitable for a wide variety of rock	Equipment can be heavy
Operation is possible above and below the water-table	Problems can occur with unstable rock formations.
Possible to drill to considerable depths	Water is needed for dry holes to help remove cuttings.

According to the PWP (**Appendix 8**) the Percussion drilling methods will be used.

ii) DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

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

The Public Participation Process (PPP) must follow Regulation 41 of NEMA EIA Regulations; thus, the process needs to be transparent. However, due to the Protection of Personal Information Act (POPI Act) which commenced on 01 July 2021, Stakeholders, Landowners, surrounding landowners and registered I&AP' addresses, contact details and comments will not be included in any draft report to be circulated. All this information will form part of the final report to be submitted to the Competent Authority only.

Should you be identified as a Stakeholder, Landowner, Surrounding landowner and you do not wish to receive any further communicate from Milnex CC regarding the application in question, you may request in writing that your details be removed from the Milnex CC database for this application.

PUBLIC PARTICIPATION PLAN

Below is a plan Milnex CC used for this application in order to ensure that reasonable opportunity was provided for public participation and that all administrative actions were reasonable for the Basic Assessment Report (Draft BAR & EMPR)

Public Participation Plan for the application was as follows:

CONSULTATION METHOD	DESCRIPTION
Written Notice	<ul style="list-style-type: none"> Registered letters will be sent to Stakeholders, Landowner, Surrounding Landowners and registered I&As. Postal services will be used and hands will be sanitised while touching each letters Where applicable and email addresses are available, notification letter will be sent via emails
Availability of the documents	<p>Draft Basic Assessment Report (Draft BAR & EMPR) can be accessed using the following manner:</p> <ul style="list-style-type: none"> A dropbox link which will be made available during circulation Sent via emails Pick-up at the Milnex office in Schweizer-Reneke, 4 Botha Street, Schweizer-Reneke, between 7:30AM and 5PM, Monday to Thursdays and between 7:30AM and 4PM on Fridays will be made available. Prior arrangement should be made so that the documents may be packaged and sanitised for pick up
Landowner consultation	<ul style="list-style-type: none"> Consultation with the landowner for their consent on the application (Consent letter)
Fixing of Notice Boards	<ul style="list-style-type: none"> Notice boards will be fixed at a place conspicuous to and accessible by the public at the boundary. Notices will be sanitised after placement
Placing of an advertisement	<ul style="list-style-type: none"> Advertisement will be placed in one local newspaper
Meetings	<ul style="list-style-type: none"> A preferred method of a meeting is online to avoid contact and any spread of the Covid-19 virus. Online/virtually methods used include Zoom or Microsoft Teams. This Meetings will be conducted upon request. This will be conducted virtually via Zoom or Microsoft Teams If there is a need, the meetings can be arranged for people less than 50 people on site (Covid regulations to be observed and no one will be allowed without a mask)

ADVERTISEMENT AND NOTICES

An advertisement was placed in English in the local newspaper (**NoordkaapBulletin**) notifying the public of the EIA process and requesting Interested and Affected Parties (I&As) to register with, and submit their comments to Milnex CC. I&As were given the opportunity to raise comments within 30 days of the advertisement. (see **Appendix 6**)

SITE NOTICES

Site notices was placed (as anticipated on the coordinates below) on site in English to inform surrounding communities and immediately adjacent landowners of the proposed development. I&As will be given the opportunity to raise comments. Photographic evidence of the site notices will be included in **Appendix 6**. Below are the coordinates where the site notices were placed.

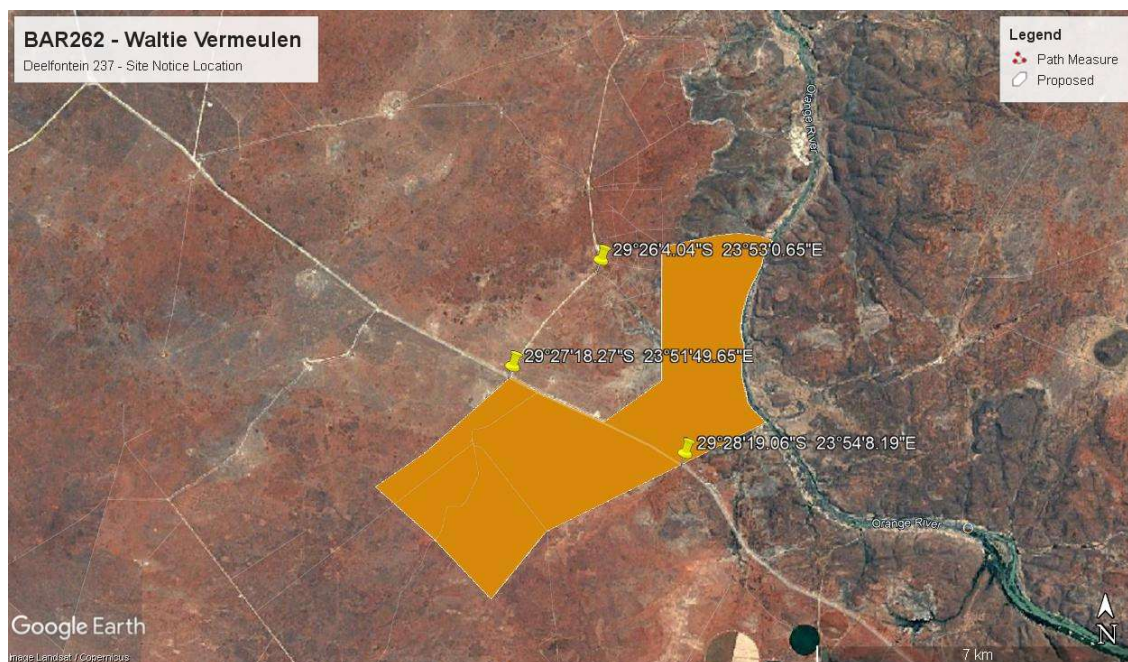


Figure 3: Site notices

Direct notification and circulation of Basic Assessment Report to identified I&AP, stakeholder, landowners, surrounding landowners, and occupiers.

Identified I&APs, including key Stakeholders representing various sectors, Landowners, Surrounding landowners and Occupiers are directly informed of the proposed development and the availability of the **Basic Assessment Report** via registered post or email on **13 May 2022** and were requested to submit comments by **13 June 2022**. A copy of the report is also available at the Milnex offices in Schweizer-Reneke, 4 Botha Street, Schweizer-Reneke and Potchefstroom (Waterberry Street, Waterberry Square, 1st floor, Office 5B, Potchefstroom), between 7:30AM and 5PM, Monday to Friday. For a complete list of stakeholder details and for proof of registered post see **Appendix 6**. The consultees included:

Table 1: List of Stakeholders, Landowners, & surrounding landowners

Stakeholders
Department of Agriculture, Environmental Affairs, Land Reform and Rural Development (DAELRRD)
Department of Co-operative Governance, Human Settlements and Traditional Affairs (COGHSTA)
Department of Economic Development and Tourism
Department of Roads and Public Works (DRPW)
Department of Transport, Safety and Liaison (DTSL)
Department of Social Development (DSD)
Northern Cape Tourism Authority
Northern Cape Heritage Resources Authority (NCHRA)
Department of Mineral Resources and Energy (DMRE)
Department of Water and Sanitation (DWS)
Northern Cape Economic Development, Trade and Investment Promotion Agency (NCEDA)
Commission on Restitution of Land Rights.
Landowner
Deelfontein Trust
Surrounding landowners
Petrus Christiaan van Wyk
Administrateur in Boedel van wyle Louis Albert Bertrand

Klipdale Trust Zelda Leonie Swiegers
Charles Peter Mathewson
JD Ferreira Familie Trust Leopold Ignatius Ferreira
Jurie Badenhorst Trust
Namakwa Boerdery No 5 Sonet Engela Bosman
P Low Trust Charlize Helene Louw & Pieter Louw
Other Stakeholders
Agricultural Extension Services Marc Caplan

It is expected from I&APs to provide their inputs and comments within 30 days after receipt of the notification or Basic Assessment Report. When the comment period ends, all comments received will be included in the final Basic Assessment Report & EMP Report.

Public Meeting

Please note that the Stakeholders & Interested and Affected Parties (I&APs) were informed about the proposed project with the use of press advertisement, registered letters and site notices. It was mentioned that due to COVID-19, any meetings will be conducted virtually via Zoom or Microsoft Teams upon request by the I&APs.

No meeting was requested by stakeholders and/or I&APs as of yet.

Issues Raised by Interested and Affected Parties

Comments received during this period are attached as comment & response report as well as populated in the table of summary of issues raised (See **Appendix 6** for comments and response form).

The Public Participation Process (PPP) must follow Regulation 41 of NEMA EIA Regulations; thus, the process needs to be transparent. However, due to the Protection of Personal Information Act (POPI Act) which commenced on 01 July 2021, Stakeholders, Landowners, surrounding landowners and registered I&AP' addresses, contact details and comments will not be included in any draft report to be circulated. All this information will form part of the final report to be submitted to the Competent Authority only.

Should you be identified as a Stakeholder, Landowner, Surrounding landowner and you do not wish to receive any further communique from Milnex CC regarding the application in question, you may request in writing that your details be removed from the Milnex CC database for this application.

iii) **SUMMARY OF ISSUES RAISED BY I&APS**

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

Interested and Affected Parties		Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issue and or response where 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.				
Organisation	Contact person			
Landowner				
Deelfontein 3/237	Deelfontein Trust Anne Rhoda Vermeulen Petrus van der Walt Vermeulen			
Surrounding Landowners				
Farm 0/270	Petrus Christiaan van Wyk			
Summerhill 0(RE)/203	Administrateur in Boedel van wyle Louis Albert Bertrand			
Eksdale 3/204	Klipdale Trust Zelda Leonie Swiegers			
Eksdale 5(RE)/204	Charles Peter Mathewson			
Farm 3&8/77	JD Ferreira Familie Trust Leopold Ignatius Ferreira			
Dolf's Doorns 4/76	Jurie Badenhorst Trust			
Darnys Bosch 1(RE)/46	Namakwa Boerdery No 5 Sonet Engela Bosman			
Darnys Bosch 2(RE)/46	P Louw Trust			

Milnex CC: BAR262PR – BAR & EMP: Environmental Authorisation Application of Mr Petrus Van Der Walt Vermeulen for the proposed Prospecting Right for the prospecting of Diamonds Alluvial (DA), Diamonds General (D), Diamonds in Kimberlite (DK) and Diamonds (DIA including associated infrastructure, structure and earthworks on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD.

	Charlize Helene Louw & Pieter Louw			
The Municipality in which jurisdiction the development is located				
Thembelihle Local Municipality	Municipal Manager: Mr Michael Jack			
Municipal councilor of the ward in which the site is located				
Thembelihle Local Municipality Ward 2 Councillor	To whom it may concern			
Organs of state having jurisdiction				
Department of Agriculture, Environmental Affairs, Land Reform and Rural Development (DAELRRD)	Head of Department: Mr Lerato wa Modise			
Department of Co-operative Governance, Human Settlements and Traditional Affairs (COGHSTA)	Andile Mbolekwa			
Department of Economic Development and Tourism (DEDT)	Head of Department: Mr T Mabija			
Department of Roads and Public Works (DRPW)	Head of Department: Mr Kholekile Nogwili			
Department of Transport, Safety and Liaison (DTSL)	Head of Department To whom it may concern			
Department of Social Development (DSD)	Head of Department To whom it may concern			
Northern Cape Tourism Authority	Communications Officers: Mr Tebogo Velemba (Marketing and Communications Officer)			
Northern Cape Heritage Resources Authority (NCHRA)	Senior Management: Mrs Rose Kelebogile (Senior Admin) and Mr Ratha Andrew Timothy (Manager)			

Department of Mineral Resources and Energy (DMRE)	Regional Manager: Mr Ndlelenhle Zindela			
	Secretary: Ms Ntombi Mayekiso			
	Jeanette Moabi			
	Machalla Ramaboea			

Milnex CC: BAR262PR – BAR & EMP: Environmental Authorisation Application of Mr Petrus Van Der Walt Vermeulen for the proposed Prospecting Right for the prospecting of Diamonds Alluvial (DA), Diamonds General (D), Diamonds in Kimberlite (DK) and Diamonds (DIA including associated infrastructure, structure and earthworks on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD.

Department of Water and Sanitation (DWS)	Mr Khutjo Kwena Sekwaila (WUL Manager)			
Northern Cape Economic Development, Trade and Investment Promotion Agency (NCEDA)	Communications Officer: Mr Alungile Ganuganu (Project Officer)			
Commission on Restitution of Land Rights.	Chief Director: Ms. M. Du Toit			
	Pabalelo Mokale			
	Phumla Thabatha Natashia romain			

Milnex CC: BAR262PR – BAR & EMP: Environmental Authorisation Application of Mr Petrus Van Der Walt Vermeulen for the proposed Prospecting Right for the prospecting of Diamonds Alluvial (DA), Diamonds General (D), Diamonds in Kimberlite (DK) and Diamonds (DIA including associated infrastructure, structure and earthworks on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD.

Other–				
Pixley Ka Seme District Municipality	Municipal Manager: Mr Rodney Pieterse			
WESSA	Graham Avery			
Agricultural Extension Services (AES)	Marc Caplan			

iv) **THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES**

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.

DEA Screening Report

According to the DEA Screening Report the Environmental Sensitivity of the proposed area is as follows:

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area according to the DEA Screening Tool.

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	12/12/20/2682	Solar PV	Approved	0
2	14/12/16/3/3/2/283	Solar PV	Approved	12.6
3	14/12/16/3/3/1/825	Solar PV	Approved	15.9

According to the DEA Screening Tool the proposed development area Environmental sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
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Agriculture Theme		X		
Animal Species Theme			X	
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme		X		
Civil Aviation Theme				X
Defence Theme				X
Paleontology Theme		X		
Plant Species Theme				X
Terrestrial Biodiversity Theme	X			

Type of environment affected by the proposed activity.

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

Geology and Soils

The oldest and predominant rock type occurring on all farms concerned are the Archaean (2.7 Ga) lithologies of the Ventersdorp Supergroup. The oldest of the Ventersdorp lithologies, a small exposure of which outcrops on the farm Hereford 202, includes the silicified volcanoclastic rocks of the Hereford formation, which is believed to be the local equivalent of the Makwassie Formation. Unconformably overlying this unit are the conglomerates, sandstones and subordinate dark shales of the Bothaville Formation. The Allanridge Formation, the youngest of the Ventersdorp Supergroup rocks, outcrops over a large portion of the review area, particularly along the Orange river, and comprises largely dark-green, amygdaloidal andesite.

Intrusive into this suite of largely andesitic lavas and subordinate, interbedded sedimentary rocks are granite intrusives of the Keimoes suite. This acidic, intrusive phase is related to the Namaqualand Metamorphic province.

Group glacial deposits of the Karoo Supergroup. These comprise largely tillites, diamictites and varved shales. Outcrops of these lower Karoo lithologies are very limited in extent and are largely preserved along the western margin of the Orange River, with small outcrops exposed in adjacent pre-Karoo valleys to the east of the Orange River. These lacial lithologies are conformably overlain by the shales of the Prince Albert and Whitehill Formations of the Ecca Group. Similarly to the Dwyka Group, these exposures are very limited in extent, with only exposure in this area occurring on the farm Eskdale 204.

Overlying most of the farms are Quaternary deposits of alluvium, windblown sand and calcrete. Deposits of calcrete are characteristic of this comparatively flat region, which has a low rainfall pattern. It is present as nodules in the superficial cover of soil and sand, or as a more or less continuous layer just below, which may crop out here and there. Much of the sand cover is dominated by windblown Recent Red Hutton Sands.

Surface drainage in the area is affected by the Orange River, which occurs on the western margin of all farms concerned. This has resulted in the formation of alluvium and sheetwash deposits, which are largely restricted to areas immediately adjacent to the river. Although no gravel deposits are visible at surface, the Orange River is often associated with alluvial gravel deposits that occur either immediately adjacent to the river or as higher level terrace deposits. These gravels, if present, may be covered by alluvium and windblown sand.

Ecological habitat and landscape features

The result obtained by plotting the coordinates are as follow:

The proposed area falls within vegetation units: Kimberley Thornveld, Northern Upper Karoo, Upper Gariep Alluvial Vegetation & Vaalbos Rocky Schrubland, see the description below:

Kimberley Thornveld

Distribution North-West, Free State and Northern Cape Provinces: Most of the Kimberley, Hartswater, Bloemhof and Hoopstad Districts as well as substantial parts of the Warrenton, Christiana, Taung, Boshof and to some extent the Barkly West Districts. Also includes pediment areas in the Herbert and Jacobsdal Districts. Altitude 1 050–1 400 m (Mucina & Rutherford, 2006).

Vegetation & Landscape Features Plains often slightly irregular with well-developed tree layer with *Acacia erioloba*, *A. tortilis*, *A. karroo* and *Boscia albitrunca* and well-developed shrub layer with occasional dense stands of *Tarchonanthus camphoratus* and *A. mellifera*. Grass layer open with much uncovered soil (Mucina & Rutherford, 2006).

Geology & Soils Andesitic lavas of the Allanridge Formation in the north and west and fine-grained sediments of the Karoo Supergroup in the south and east. Deep (0.6–1.2 m) sandy to loamy soils of the Hutton soil form (Ae and Ah land types) on slightly undulating sandy plains (Mucina & Rutherford, 2006).

Climate Summer and autumn rainfall and very dry winters. MAP from about 300 mm in the southwest to about 500 mm in the northeast. Frost frequent in winter. Mean monthly maximum and minimum temperatures for Kimberley 37.5°C and –4.1°C for January and July, respectively. Corresponding values for Vaalharts-Agr 37.4°C and –3.9°C, respectively. See also climate diagram for SVk 4 Kimberley Thornveld (Mucina & Rutherford, 2006).

Important Taxa Tall Tree: *Acacia erioloba* (d). Small Trees: *Acacia karroo* (d), *A. mellifera* subsp. *detinens* (d), *A. tortilis* subsp. *hete-racantha* (d), *Rhus lancea*. Tall Shrubs: *Tarchonanthus camphoratus* (d), *Diospyros pallens*, *Ehretia rigida* subsp. *rigida*, *Euclea crispa* subsp. *ovata*, *Grewia flava*, *Lycium arenicola*, *L. hirsutum*, *Rhus tridactyla*. Low Shrubs: *Acacia hebeclada* subsp. *hebeclada* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum zeyheri*, *Hermannia comosa*, *Lycium pilifolium*,

Melolobium microphyllum, Pavonia burchellii, Peliostomum leucorrhizum, Plinthus sericeus, Wahlenbergia nodosa. Succulent Shrubs: Aloe hereroensis var. hereroensis, Lycium cinereum. Graminoids: Eragrostis lehmanniana (d), Aristida canescens, A. congesta, A. mollissima subsp. argentea, Cymbopogon pospischilii, Digitaria argyrograpta, D. eriantha subsp. eriantha, Enneapogon cenchroides, E. scoparius, Eragrostis rigidior, Heteropogon contortus, Themeda triandra. Herbs: Barleria macrostegia, Dicoma schinzii, Harpagophytum procumbens subsp. procumbens, Helichrysum cerastioides, Hermestaedia odorata, Hibiscus marlothianus, Jamesbrittenia aurantiaca, Lippia scaberrima, Osteospermum muricatum, Vahlia capensis subsp. vulgaris. Succulent Herbs: Aloe grandidentata, Piaranthus decipiens (Mucina & Rutherford, 2006).

Biogeographically Important Taxa (GWRiqualand West endemic, Kalahari endemic) Low Shrub: Blepharis marginata. Succulent Shrub: Euphorbia bergii. Graminoid: Panicum kalaharensis. Herbs: Helichrysum Arenicola, Neuradopsis bechuanensis. Succulent Herbs: Lithops aucampiae subsp. aucampiae, Tridentea marientalensis subsp. marientalensis (Mucina & Rutherford, 2006).

Conservation Least threatened. Target 16%. Only 2% statutorily conserved in Vaalbos National Park as well as in Sandveld, Bloemhof Dam and S.A. Lombard Nature Reserves. Some 18% already transformed, mostly by cultivation. Erosion is very low. Area is mostly used for cattle farming or game ranching. Overgrazing leads to encroachment of Acacia mellifera subsp. detinens (Mucina & Rutherford, 2006).

Northern Upper Karoo

Distribution Northern Cape and Free State Provinces: Northern regions of the Upper Karoo plateau from Prieska, Vosburg and Carnarvon in the west to Philipstown, Petrusville and Petrusburg in the east. Bordered in the north by Niekerkshoop, Douglas and Petrusburg and in the south by Carnarvon, Pampoenpoort and De Aar. A few patches occur in GRIQUALAND WEST. Altitude varies mostly from 1 000–1 500 m (Mucina & Rutherford, 2006).

Vegetation & Landscape Features Shrubland dominated by dwarf karoo shrubs, grasses and *Acacia mellifera* subsp. *detinens* and some other low trees (especially on sandy soils in the northern parts and vicinity of the Orange River). Flat to gently sloping, with isolated hills of Upper Karoo Hardeveld in the south and Vaalbos Rocky Shrubland in the northeast and with many interspersed pans (Mucina & Rutherford, 2006).

Geology & Soils Shales of the Volksrust Formation and to a lesser extent the Prince Albert Formation (both of the Ecce Group) as well as Dwyka Group diamictites form the underlying geology. Jurassic Karoo Dolerite sills and sheets support this vegetation complex in places. Wide stretches of land are covered by superficial deposits including calcretes of the Kalahari Group. Soils are variable from shallow to deep, red-yellow, apedal, freely drained soils to very shallow Glenrosa and Mispah forms. Mainly Ae, Ag and Fc land types (Mucina & Rutherford, 2006).

Climate Rainfall peaks in autumn (March). MAP ranges from about 190 mm in the west to 400 mm in the northeast. Mean maximum and minimum monthly temperatures for Britstown are 37.9°C and –3.6°C for January and July, respectively. Corresponding values are 37.1°C and –4.8°C for De Aar and 39.0°C and –2.3°C for Kareekloof (northwest of Strydenburg). See also climate diagram for NKu 3 Northern Upper Karoo (Figure 7.2) (Mucina & Rutherford, 2006).

Important Taxa Small Trees: *Acacia mellifera* subsp. *detinens*, *Boscia albitrunca*. Tall Shrubs: *Lycium cinereum* (d), *L. horridum*, *L. oxycarpum*, *L. schizocalyx*, *Rhigozum trichotomum*. Low Shrubs: *Chrysocoma ciliata* (d), *Gnidia polycephala* (d), *Pentzia calcarea* (d), *P. globosa* (d), *P. incana* (d), *P. spinescens* (d), *Rosenia humilis* (d), *Amphiglossa triflora*, *Aptosimum marlothii*, *A. spinescens*, *Asparagus glaucus*, *Barleria rigida*, *Berkheya annectens*, *Eriocephalus ericoides* subsp. *ericoides*, *E. glandulosus*, *E. spinescens*, *Euryops asparagoides*, *Felicia muricata*, *Helichrysum lucilloides*, *Hermannia spinosa*, *Leucas capensis*, *Limeum aethiopicum*, *Melolobium candicans*, *Microloma armatum*, *Osteospermum leptolobum*, *O. spinescens*, *Pegolettia retrofracta*, *Pentzia lanata*, *Phyllanthus maderaspatensis*, *Plinthus karoicus*, *Pteronia glauca*, *P. sordida*, *Selago geniculata*, *S. saxatilis*, *Tetragonia arbuscula*, *Zygophyllum lichtensteinianum*. Succulent Shrubs: *Hertia pallens*, *Salsola calluna*, *S. glabrescens*, *S. rabieana*, *S. tuberculata*, *Zygophyllum flexuosum*. Semiparasitic Shrub: *Thesium hystrix* (d). Herbs: *Chamaesyce inaequilatera*, *Convolvulus sagittatus*, *Dicoma capensis*, *Gazania krebsiana*, *Hermannia comosa*, *Indigofera alternans*, *Lessertia pauciflora*, *Radyera urens*, *Sesamum capense*, *Sutera pinnatifida*, *Tribulus terrestris*, *Vahlia capensis*. Succulent Herb: *Psilocaulon coriarium*. Geophytic Herb: *Moraea pallida*. Graminoids: *Aristida adscensionis* (d), *A. congesta* (d), *A. diffusa* (d), *Enneapogon desvauxii* (d), *Eragrostis lehmanniana* (d), *E. obtusa* (d), *E. truncata* (d), *Sporobolus fimbriatus* (d), *Stipagrostis obtusa* (d), *Eragrostis bicolor*, *E. porosa*, *Fingerhuthia africana*, *Heteropogon contortus*, *Stipagrostis ciliata*, *Themeda triandra*, *Tragus berteronianus*, *T. koelerioides*, *T. racemosus* (Mucina & Rutherford, 2006).

Biogeographically Important Taxa Herb (western distribution limit): *Convolvulus boedeckerianus*. Tall Shrub (southern limit of distribution): *Gymnosporia szyszowiczii* subsp. *Namibiensis* (Mucina & Rutherford, 2006).

Endemic Taxa Succulent Shrubs: *Lithops hookeri*, *Stomatium pluridens*. Low Shrubs: *Atriplex spongiosa*, *Galenia exigua*. Herb: *Manulea deserticola* (Mucina & Rutherford, 2006).

Conservation Least threatened. Target 21%. None conserved in statutory conservation areas. About 4% has been cleared for cultivation (the highest proportion of any type in the Nama-Karoo) or irreversibly transformed by building of dams (Houwater, Kalkfontein and Smart Syndicate Dams). Areas of human settlements are increasing in the northeastern part of this vegetation type (Hoffman et al. 1999). Erosion is moderate (46.2%), very low (32%) and low (20%). *Prosopis glandulosa*, regarded as one of the 12 agriculturally most important invasive alien plants in South Africa, is widely distributed in this vegetation type (Hoffman et al. 1999). *Prosopis* occurs in generally isolated patches, with densities ranging from very scattered to medium (associated with the lower Vaal River drainage system and the confluence with the Orange River) to localised closed woodland on the western border of the unit with Bushmanland Basin Shrubland (Mucina & Rutherford, 2006).

Remark This Karoo unit is found on floristic and ecological gradients between the Nama-Karoo, arid Kalahari savanna and arid highveld grasslands (Mucina & Rutherford, 2006).

Upper Gariep Alluvial Vegetation

Distribution Free State and Northern Cape Provinces: Broad alluvia of the Orange River, lower Caledon as well as lower stretches of the Vaal, Riet and Modder Rivers as far as Groblershoop. These river stretches are surrounded by vegetation units of broad transitional regions between the dry facies of the Savanna and Grassland and northern regions of the Nama-Karoo Biome. Altitude ranging from 1 000–1 500 m (Mucina & Rutherford, 2006).

Vegetation & Landscape Features Flat alluvial terraces supporting complex of riparian thickets (gallery forests) dominated by native *Acacia karoo* and *Diospyros lycioides*, flooded grasslands, reed beds and ephemeral herblands populating mainly sand banks within the river and on its banks (Mucina & Rutherford, 2006).

Geology, Soil & Hydrology Recent alluvial deposits underlain mostly by Karoo Supergroup sediments and tillites, supporting soils typical of la group land types. Subject to flooding, especially in summer (Mucina & Rutherford, 2006).

Climate Bimodal (equinoctial) climate with a major peak in March and with a lesser peak in November–December. The overall MAP is 325 mm (range 230–600 mm for Prieska and Wepener, respectively). MAT for the entire area averages 17°C (range 19.3–15.4°C for Prieska and Aliwal North, respectively). See also climate diagram for AZa 4 Upper Gariep Alluvial Vegetation (Figure 13.2) (Mucina & Rutherford, 2006).

Important Taxa Riparian thickets Small Trees: *Acacia karoo* (d), *Celtis africana* (d), *Salix mucronata* subsp. *mucronata* (d). Tall Shrubs: *Diospyros lycioides* (d), *Melianthus comosus* (d), *Rhus pyroides*. Low Shrubs: *Asparagus setaceus*, *A. suaveolens*. Woody Climber: *Clematis brachiata*. Succulent Shrubs: *Lycium arenicola*, *L. hirsutum*. Herb: *Rubia cordifolia*. Flooded grasslands & herblands Graminoid: *Melica decumbens* (d). Herbs: *Cineraria dregeana*, *C. lobata* (Mucina & Rutherford, 2006).

Conservation Vulnerable. Target 31%. Only about 3% statutorily conserved in Tussen Die Riviere, Gariep Dam and Oviston Nature Reserves. More than 20% transformed for cultivation (vegetables, grapes) and building of dams. Exotic woody species such as *Salix babylonica*, *Eucalyptus camaldulensis*, *E. sideroxylon*, *Prosopis* and *Populus* species have become common dominants in patches of heavily disturbed alluvial vegetation (Mucina & Rutherford, 2006).

Vaalbos Rocky Shrubland

Distribution Northern Cape and Free State Provinces: Extends along solitary hills and scattered ridges east of the confluence of the Orange and Vaal Rivers, mainly in the Kimberley and Herbert Districts and west of a line bounded by the western Free State towns of Luckhoff, Petrusburg, Dealesville, Bultfontein and Hertzogville. Altitude 1 000–1 400 m (Mucina & Rutherford, 2006).

Vegetation & Landscape Features Slopes and elevated hills and ridges within plains of mainly SVk 4 Kimberley Thornveld, also in the vicinity of NKu 3 Northern Upper Karoo. Evergreen shrub communities dominated by *Tarchonanthus camphoratus*, *Olea europaea* subsp. *africana*, *Euclea crispa*, *Diospyros lycioides*, *Rhus burchellii* and *Buddleja saligna*. Sheltered, cool sites include trees such as *R. lancea*, *Celtis africana* and *Ziziphus mucronata*. On the footslopes of the dolerite hills, where calcrete-rich soils occur, shrubs and small trees of *Acacia tortilis* and *Z. mucronata* can be dominant (Mucina & Rutherford, 2006).

Geology & Soils A highly fragmented area on Ecca and Dwyka Group sediments and Karoo dolerites as well as Ventersdorp Supergroup lavas (Allanridge Formation). Extensive dolerite sills which form ridges, and plateaus and slopes of koppies and small escarpments mark the erosion terraces. These dolerite sills cover alternating layers of mudstone and sandstone of sedimentary origin. The lb land type is typical of these rock- and boulder-covered slopes. Prominent soil forms are the stony Mispah and gravel-rich Glenrosa forms derived from Jurassic dolerite, calcrete-rich soils cover the lowlands (Kimberley and Plooyburg forms) (Mucina & Rutherford, 2006).

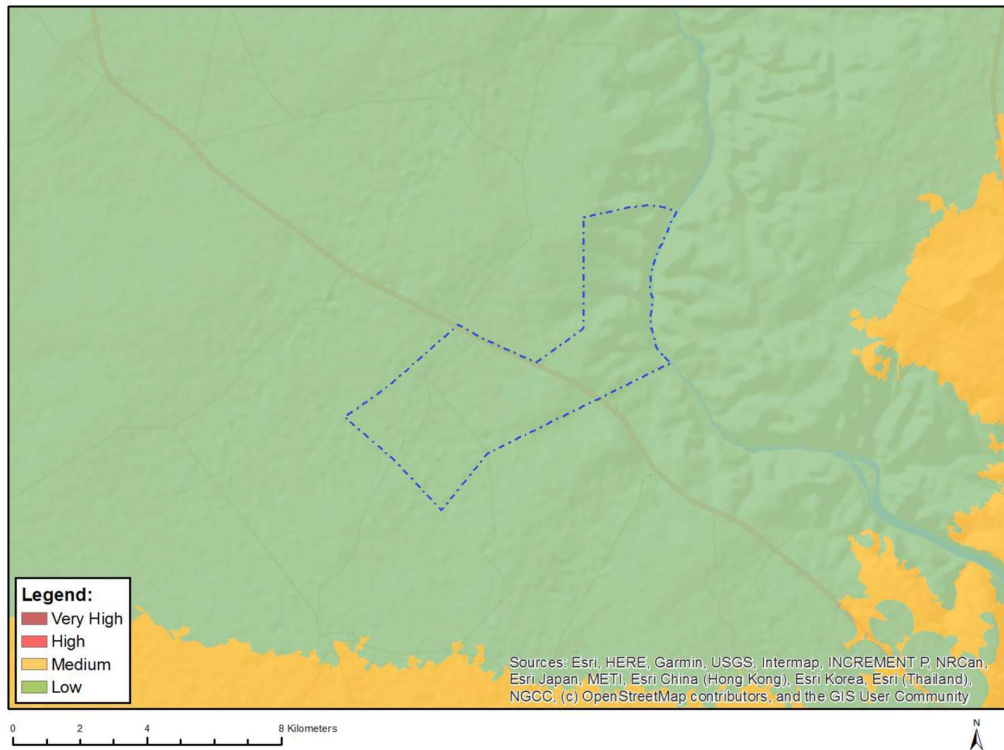


Figure 5: Plant Species Combined Sensitivity

According to the Terrestrial Biodiversity & Wetland Impact Assessment Report (Appendix 12), the below table represents dominant plant species observed on the study site.

Plant species list			
Trees and Shrubs			
Scientific Name	Common Name	Status	Invader category (NEMBA 2020)
<i>Amphiglossa triflora</i>	Yellowthorn daisy	IUCN 3.1 redlist	
<i>Asparagus burchellii</i>	Wild asparagus	Least concern, endemic	
<i>Asparagus suaveolens</i>	Wild asparagus	Least concern	
<i>P</i>Boscia albitrunca	Sheperd's tree	Least concern	
<i>Diospyros lycioides</i>	Bushveld Bluebush	Least concern	
<i>Hermannia spp</i>	Doll's rose	Least concern	
<i>Lasiosiphon polycephalus</i>	Bessembossie	Least concern	
<i>Lycium spp</i>	Box thorns	Least concern	
<i>Melolobium canescens</i>	Heuningbossie	Least concern	
<i>Peliostomum leucorrhizum</i>	Veld violet	Least concern	
<i>Pentzia incana</i>	African sheepbush	Least concern	
<i>Rhigozum trichotomum</i>	Three thorn	Least concern	
<i>Searsia lancea</i>	Karree	Least concern	
<i>Senegalia mellifera</i>	Black thorn	Least concern	
<i>*Solanum mauritianum</i>	Bugweed	Exotic, declared invader	1b
<i>Tarhonanthus camphoratus</i>	Camphor bush	Least concern	
<i>P</i>Vachelia erioloba	Camel thorn	Least concern	
<i>P</i>Vachellia haematoxylon	Grey Camel Thorn	Least concern	
<i>Vachelia karoo</i>	Sweet thorn tree	Least concern	
<i>Ziziphus mucronata</i>	Buffalo-thorn	Least concern	
<i>Ziziphus zeyheriana</i>	Dwarf Buffalo-thorn	Least concern	

Graminoids			
<i>Aristida congesta</i>	Spreading Three-awn	Least concern	
<i>Asparagus burchellii</i>	Wild asparagus	Least concern, endemic	
<i>Cenchrus ciliaris</i>	Foxtail Buffalo grass	Least concern	
<i>Cynodon dactylon</i>	Couch Grass	Least concern	
<i>Enneapogon cenchroides</i>	Furgrass	Least concern	
<i>Eragrostis spp</i>	Lovegrass	Least concern	
<i>Fingerhuthia africana</i>	Thimble grass	Least concern	
<i>Heteropogon contortus</i>	Spear grass	Least concern	
<i>Hyparrhenia hitra</i>	Thatching grass	Least concern	
<i>Panicum coloratum</i>	Small buffalo grass	Least concern	
<i>Pogonarthria squarrosa</i>	Herringbone grass	Least concern	
<i>Setaria verticillata</i>	Hooked bristlegrass	Least concern	
<i>Stipagrostis ciliata</i>	Bushman grass	Least concern	
<i>Stipagrostis obtusa</i>	Small bushman grass	Least concern	
Herbs			
<i>Aptosimum lineare</i>		Least concern	
<i>Aptosimum spinescens</i>	Kankerbossie	Least concern	
<i>Barleria macrostegia</i>	Tongklapper	Least concern	
Geophytes			
<i>Boophone disticha</i>	Tumble weed	Least concern	
Forbs and Succulents			
# <i>Agave americana</i>	Century plant	Naturalised Invader	3 (Western cape)
# <i>Aloe claviflora</i>	Kraal aloe	IUCN 3.1 redlist	
* <i>Bidens pilosa</i>	Blackjack	Exotic	
* <i>Datura stramonium</i>	Downy Thorn Apple	Exotic, declared invader	1b
# <i>Erigeron bonariensis</i>	Asthmaweed	Naturalised Invader weed	
* <i>Opuntia ficus-indica</i>	Sweet prickly pear	Exotic, declared invader	1b
# <i>Schkuria pinnata</i>	Dwarf Mexican marigold	Naturalised exotic	
* <i>Xanthium strumarium</i>	Large Cocklebur	Exotic, declared invader	1b

30% of *Aloe claviflora* and *Boophone disticha* plants should be relocated in areas to be disturbed as they are provincially protected.

Three protected tree species were recorded namely: *Boscia albitrunca*, *Vachellia erioloba* and *Vachellia haematoxylon*. If any of these trees are to be removed a protected tree license will have to be obtained.

See the full report under **Appendix 12**.

Agricultural / land capability

According to an article on the Grain SA website by Garry Paterson from ARC-Institute for Soil, Climate and Water on the Grain SA website, agriculture rests on three pillars where natural resources are concerned. These are the soil (comprising the growth medium for the plant), the climate conditions (which supply the plant with sufficient water and heat) and the terrain (enabling the crop to be physically planted, to grow and to be harvested sustainably).

The concept of land capability combines the three natural resource elements or factors listed above (soil, climate and terrain) and uses set parameters to determine a specific class for a given area. The basis of the land capability assessment in South Africa is the well-known Land Type Survey, which is a country-wide inventory of natural resources, i.e. soil pattern, macroclimate and terrain type, carried out between 1972 and 2002 by the ARC-Institute for Soil, Climate and Water.

Each unique land type is allocated to one of eight land capability classes. These classes are based on the original USDA land capability system, whereby Classes I and II comprise areas with little or no limitations to rainfed agriculture, Classes III and IV comprise those areas which are still considered arable, but with moderate to severe restrictions. Classes V to VIII comprise non-arable land with increasingly serious restrictions, either in terms of restricted soil, steep terrain, rockiness and/or an unfavourable climatic regime. (Garry Paterson, ARC-Institute for Soil, Climate and Water, November 2014.)

The proposed area falls within Land in Class VII (7). (refer to Land capability map on **figure 6** and attached as **Appendix 5**).

Threatened Ecosystems

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Driver et al. 2011). Datasets have been developed by SANBI (2016) in order to outline threatened ecosystems, with the primary objective of limiting the rate of ecosystem extinctions. Four established categories group these ecosystems namely: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) and Protected.

According to **Figure 8**, the area does not fall within a threatened ecosystem

Protected Areas

Formally protected areas are protected either by national or provincial legislation. Based on the SANBI (2010) Protected Areas Map (**Figure 8**), the proposed area does not fall within a formally protected area.

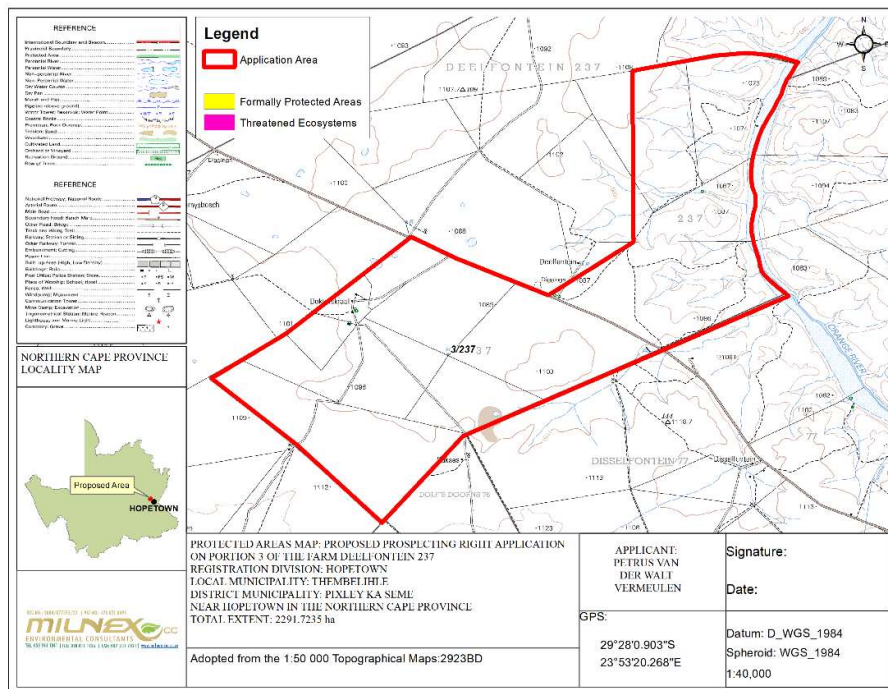


Figure 8: Threatened Ecosystems and Formally Protected Area.

Critical Biodiversity Area

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic areas of high biodiversity value that need to be conserved and maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services (MTPA, 2014). According to the National Environmental Management Act (NEMA) (Act no. 107 of 1998) certain activities have strict guidelines or are prohibited within CBAs and ESAs. Refer to the listed activities under the NEMA: Environmental Impact Assessment Regulations of 2014 (GNR 982) as promulgated in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) [as amended] for a comprehensive breakdown. The following terms are used to categorise the various land used types according to their biodiversity and environmental importance:

- Critical Biodiversity Area One (CBA1);
- Critical Biodiversity Area Two (CBA2);
- Ecological Support Area (ESA);

- Other Natural Areas (ONA); and
- Protected Area (PA).

Based on the desktop information, sections of the study site overlap with CBA1, CBA2 and ESA. These areas were mostly covered with natural vegetation and were flagged in the screening report as areas possessing very high terrestrial biodiversity sensitivity. The depression wetlands are classed as ESA and the south-western section of the study site is classed as Other Natural Areas. According to a matrix of recommended land use zones and associated activities in relation to the CBA map categories (DENC, 2008), prospecting is not permitted, and actively discouraged in CBA 1 areas. In CBA 2, ESA areas, prospecting is restricted to compulsory, site specific conditions and controls. When these conditions are unavoidable, prospecting is usually not permitted.

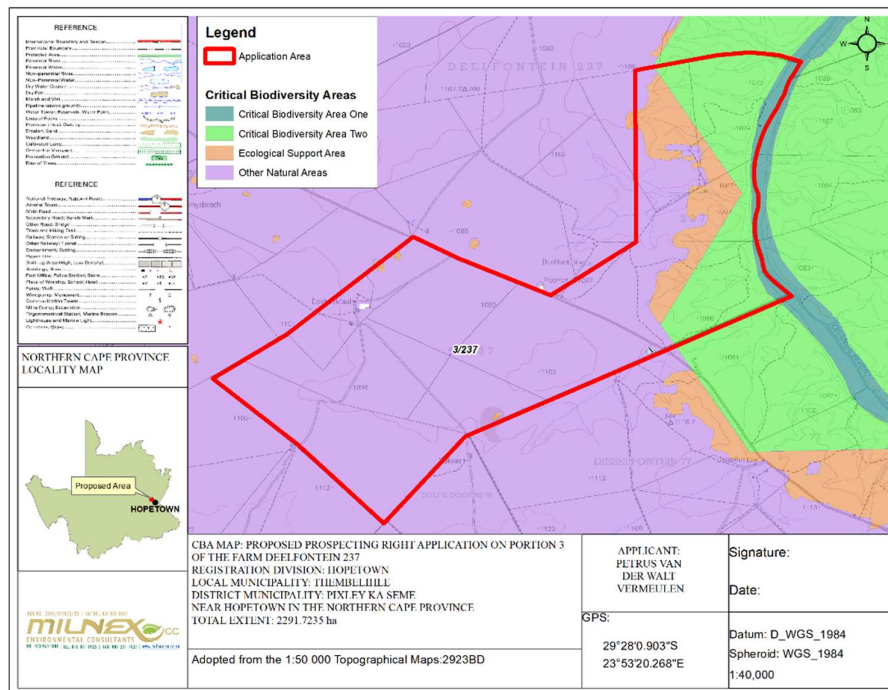


Figure 9: Critical Biodiversity Areas (CBAs) associated with the study site.

According to the DEA Screening Report most of the proposed area falls partly within a Very High Terrestrial Biodiversity sensitivity, the other portion as depicted falls within a low sensitivity. Please see **Appendix 7** for the colour map.

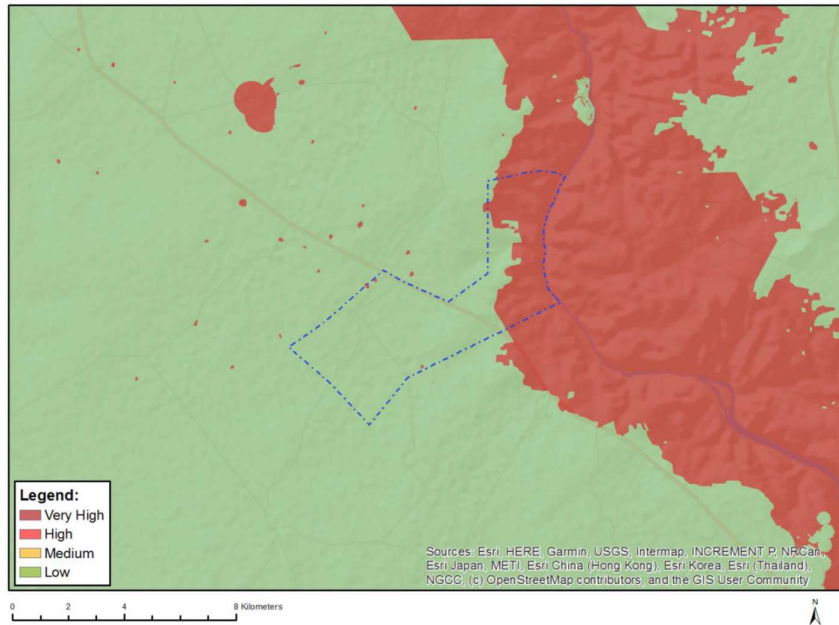


Figure 10: Terrestrial Biodiversity Combined Sensitivity

According to the DEA Screening Report the proposed area falls mostly within low Aquatic Biodiversity theme sensitivity and to a very small extent within a Very High along the Orange-river. Please see **Appendix 7** for the colour map.

The study site falls within the D33H Quaternary Catchment and forms part of the Upper Orange Water Management Area (WMA) (DWS, 2016). The Upper Orange WMA covers a total catchment area of 102 840 km², with its major rivers being the Modder, Riet, Caledon and the Orange. The Orange River is situated on the north-eastern border of the study site, which is classed as Largely Modified (CLASS D).

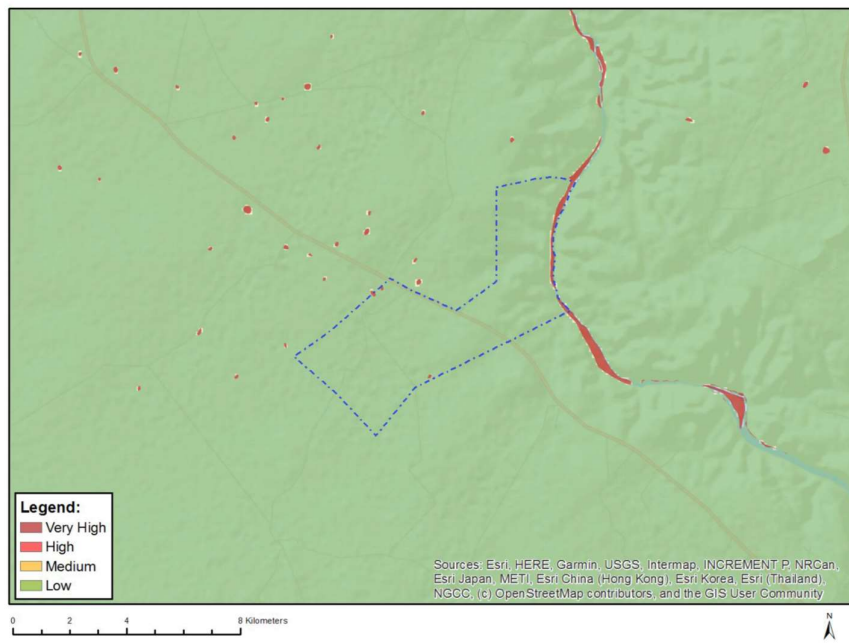


Figure 11: Aquatic Biodiversity Combined Sensitivity

Map of relative Animal Species theme sensitivity according to the DEA Screening Tool, which illustrates the Animal Species theme sensitivity is mostly low, with some areas that fall within a low sensitivity. Please see **Appendix 7** for the colour map.

A post-screening site visit was therefore conducted to determine the accuracy of the generated information, and if the studies recommended should be conducted. After the site visit it was concluded the the animal species theme is classified as a high sensitivity.

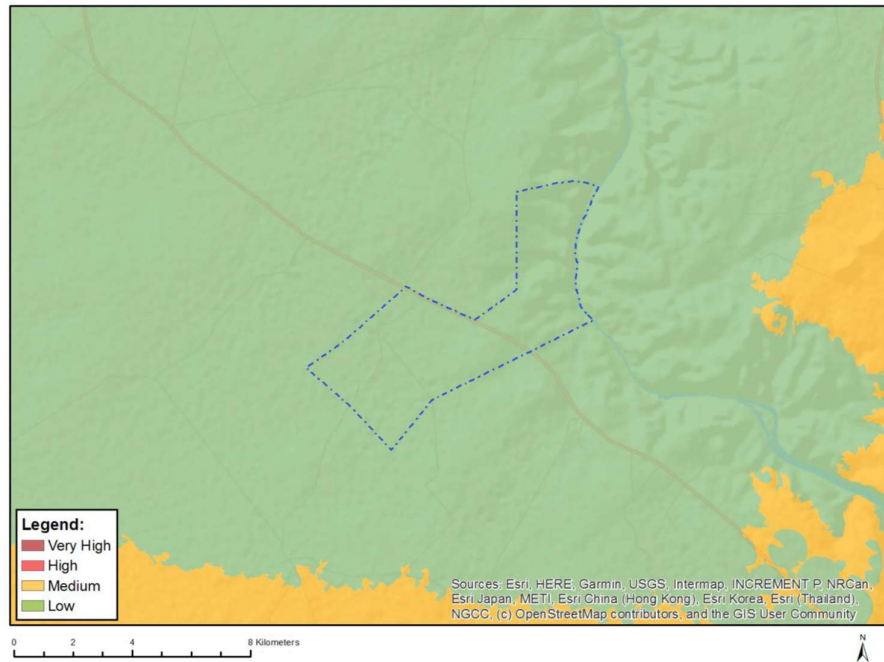


Figure 12: Animal Species theme sensitivity

The table below lists the mammal species possibly occurring on the proposed site according to the Animal Demography Unit (2019) alongside the designated statuses of those species in the South African Red list of Mammals (2012) and the Threatened or Protected Species (ToPS) List (NEMBA, 10 of 2004). Several species potentially occurring on site are protected under NEMBA (See species in bold).

The DFFE screening tool report did not flag any SCC that may potentially occur on site. Most of the mammals listed below were observed on site and have a high likelihood of occurrence within the study area due to the presence and abundance of suitable habitat. Most of the listed mammals are dependent on savannah woodlands and open grasslands for grazing. Evidence of occurrence was noted in the form of spoor, droppings, burrows, bones and carcasses.

Family	Scientific Name	Common Name	Red List Category	ToPS
Bovidae	<i>Aepyceros melampus</i>	Impala	Least Concern	
Bovidae	<i>Raphicerus campestris</i>	Steenbok	Least Concern (2016)	
Bovidae	<i>Tragelaphus strepsiceros</i>	Greater Kudu	Least Concern (2016)	
Canidae	<i>Canis mesomelas</i>	Black-backed Jackal	Least Concern (2016)	
Cercopithecidae	<i>Chlorocebus pygerythrus</i>	Vervet Monkey	Least Concern (2016)	
Felidae	<i>Caracal caracal</i>	Caracal	Least Concern (2016)	
Felidae	<i>Felis nigripes</i>	Black-footed Cat	Vulnerable (2016)	Protected
Felidae	<i>Felis silvestris</i>	Wildcat	Least Concern (2016)	

Felidae	<i>Leptailurus serval</i>	Serval	Near Threatened (2016)	Protected
Herpestidae	<i>Cynictis penicillata</i>	Yellow Mongoose	Least Concern (2016)	
Herpestidae	<i>Suricata suricatta</i>	Meerkat	Least Concern (2016)	
Herpestidae	<i>Mungos mungo</i>	Banded Mongoose	Least Concern (2016)	
Hyaenidae	<i>Proteles cristata</i>	Aardwolf	Least Concern (2016)	
Mustelidae	<i>Mellivora capensis</i>	Honey Badger	Least Concern (2016)	Protected
Mustelidae	<i>Aonyx capensis</i>	African clawless otter	Near Threatened (2016)	
Orycteropodidae	<i>Orycteropus afer</i>	Aardvark	Least Concern (2016)	
Sciuridae	<i>Xerus inauris</i>	South African Ground Squirrel	Least Concern	
Suidae	<i>Phacochoerus africanus</i>	Common Warthog	Least Concern (2016)	
Hysticidae	<i>Hystrix africaeaustralis</i>	Cape Porcupine	Least Concern (2016)	
Viverridae	<i>Civettictis civetta</i>	African Civet	Least Concern (2016)	
Viverridae	<i>Genetta genetta</i>	Common Genet	Least Concern (2016)	

See the full report under **Appendix 12**.

Biodiversity Priority Areas for Mining

The Mining and Biodiversity Guideline was developed in 2013 for the purpose of mainstreaming biodiversity management practices into the mining sector (DEA, DMR, Chamber of Mines, SAMBF & SANBI 2013). This Guideline provides explicit direction in terms of where mining-related impacts are legally prohibited, where biodiversity priority areas may present high risks for mining projects, and where biodiversity may limit the potential for mining. The Guideline distinguishes between four categories of biodiversity priority areas in relation to their importance from a biodiversity and ecosystem service perspective as well as the implications for mining in these areas (**Table 2**).

Table: Four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining.

Category	Biodiversity Priority Areas	Risks for Mining	Implications for Mining
A. Legally Protected	<ul style="list-style-type: none"> Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves) Areas declared under Section 49 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) 	Mining Prohibited	<p>Mining projects cannot commence as mining is legally prohibited. Although mining is prohibited in Protected Areas, it may be allowed in Protected Environments if both the Minister of Mineral Resources and Minister of Environmental Affairs approve it.</p> <p>In cases where mining activities were conducted lawfully in protected areas before Section 48 of the Protected Areas Act (No. 57 of 2003) came into effect, the Minister of Environmental Affairs may, after consulting with the Minister of Mineral Resources, allow such mining activities to continue, subject to prescribed conditions that reduce environmental impacts.</p>
B. Highest Biodiversity Importance	<ul style="list-style-type: none"> Critically endangered and endangered ecosystems Critical Biodiversity Areas (or equivalent areas) from 	Highest Risk for Mining	<p>Environmental screening, environmental impact assessment (EIA) and their associated biodiversity specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to</p>

	<p>provincial spatial biodiversity plans</p> <ul style="list-style-type: none"> • River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1km buffer around these FEPAs • Ramsar Sites 		<p>apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licences, and environmental authorisations.</p> <p>If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being.</p> <p>An EIA should include the strategic assessment of optimum, sustainable land use for an area and will determine the significance of the impact on biodiversity.</p> <p>This assessment should fully consider the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country.</p> <p>Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p>
<p>C. High Biodiversity Importance</p>	<ul style="list-style-type: none"> • Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves) • Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas) • Other identified priorities from provincial spatial biodiversity plans • High water yield areas • Coastal Protection Zone • Estuarine functional zone <p>*Note that the status of buffer areas of World Heritage Sites is subject to a current intra-governmental process</p>	<p>High Risk for Mining</p>	<p>These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and for maintaining important ecosystem services for communities or the country.</p> <p>An EIA should include an assessment of optimum, sustainable land use for an area and will determine the significance of the impact on biodiversity.</p> <p>Mining options may be limited in these areas, and limitations for mining projects are possible.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p>
<p>D. Moderate Biodiversity Importance</p>	<ul style="list-style-type: none"> • Ecological support areas • Vulnerable ecosystems • Focus areas for protected area expansion (land-based and offshore protection) 	<p>Moderate Risk for Mining</p>	<p>These areas are of moderate biodiversity value.</p> <p>EIAs and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, identifying features (e.g. threatened (land-based and offshore protection) species) not included in the existing datasets, and on</p>

			<p>providing site-specific information to guide the application of the mitigation hierarchy.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p>
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Based on **Figure 13**, the proposed area overlaps with non of the above categories.

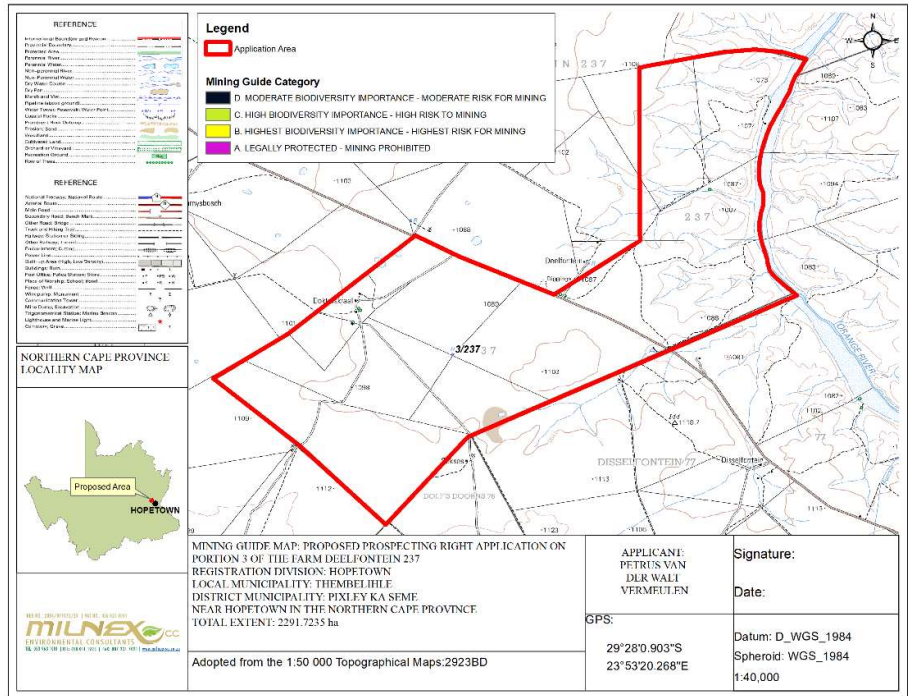


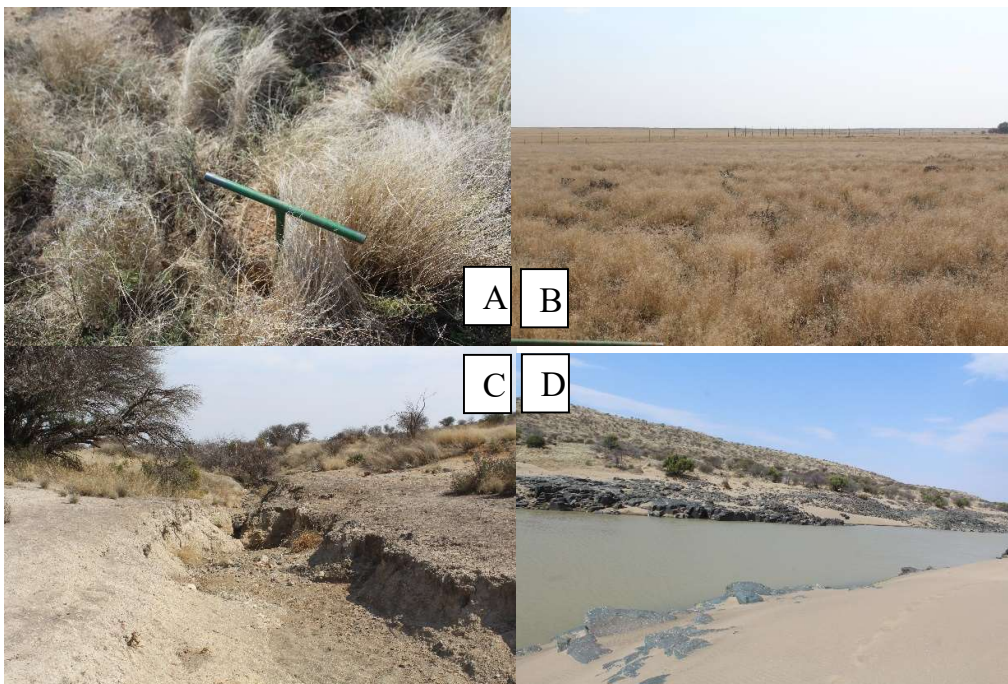
Figure 13: Biodiversity priority areas, in accordance with the Mining of Biodiversity Guidelines, associated with the study site.

Wetland Areas

In terms of Section 1 of the National Water Act (No. 36 of 1998) (NWA), wetlands are legally defined as: “land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil” (NWA 1998).

Wetlands are defined by the presence of unique soils and vegetation that do not occur in terrestrial and purely aquatic environments (Edwards *et al.* 2018). Wetland soils are referred to as hydric soils that develop under anaerobic conditions (condition where oxygen is virtually absent from the soil). Wetlands are also typically characterized by relatively large and dense stands of plants sticking out of shallow water or wet soil. Plants adapted to such waterlogged conditions are referred to as hydrophytes. Wetlands are distinct from true aquatic ecosystems like river ecosystems, which are characterized by fast flowing water within channels, and lake ecosystems, that are flooded to great depth; both of which are not primarily characterized by the occurrence of hydric soils and hydrophytes.

A wide variety of wetland types are present in South Africa, and can be classified into six broad types, namely floodplain wetlands, unchannelled valley bottom wetlands, channelled valley bottom wetlands, seeps, depressions and wetland flats. Owing to the large variations in climate and topography across South Africa, vegetation and habitat associated with these



Wetlands assessed on site. **A:** Grass Depression. **B:** Grass Depression. **C:** Eroding drainage channel. **D:** Orange River floodplain

Numerous Depressions outside the development areas, and Non-perennial drainage areas were also identified. However, based on the development type, and the distance of the wetlands from the study site, they are not deemed to be at risk. Furthermore, the drainage areas do not receive and retain enough water to support riparian characteristics throughout the year.

The ephemeral depression (Pans) assessed on site was noted to be dry most of the year. Therefore, physical structure and soil characteristics were the main indicators used.

The study focused on features which were potentially most at risk as a result of the prospecting and associated activities. The potential impacts of activities such as commercial farming, drought, erosion and clearing of natural vegetation within the greater catchment were taken into consideration during the assessment.

Description of the assessed wetland areas on site.

Feature	Depression	Floodplain
Catchment Features and Current Impacts	The catchment area of this wetland is endorheic, meaning there is no outflow and surface water drains from the catchment towards the lowest part of the Depression. At the time of the field survey, no surface water was observed in the assessed wetlands. Major impacts in the catchment area, consist of livestock and game farming, and access roads along the wetland system.	The catchment area of this assessed unit is exorheic meaning there is outflow and surface water drains from the catchment towards the lowest part of the Floodplain. At the time of the field survey surface water was observed in the assessed wetland. Major impacts in the catchment area consist of prospecting and mining along the major river systems.
Wetland Type	Depression (grass pan)	Floodplain wetland (Orange river)
Downstream Features	None - depressions are endorheic systems	Mining and Agricultural activities.

Vegetation Characteristics	Vegetation is dominated by a mix of graminoid species	Vegetation was sparsely distributed along the length of the wetland and dominated by species of tall and short trees, shrubs and grasses (<i>Celtis africana</i> , <i>Ziziphus mucronata</i> , <i>Senegalia mellifera</i> , <i>Vachellia karoo</i> and <i>Searsia lancea</i>)
Algae Presence	None.	None.
Aquatic Faunal Impacts	No major impacts were observed on site, as the study site was in a natural state with no major anthropogenic activities occurring near the wetland areas.	The greatest impact would be from an increased sediment load as a result of erosion from the upstream mining activities.
Depth Characteristics	The depression was dry	Not assessed
Flow Conditions	The depression was dry	Not assessed
Water Clarity	The depression was dry	High turbidity.
Water Odour	The depression was dry	No odour.
Erosion Impacts	High erosion potential as the pan floor and bank are poorly vegetated.	High erosion potential as the wetland floor and banks are almost completely stripped of natural vegetation.
Soil characteristics	Redoximorphic features such as mottling were present at the edges/borders of the wetlands. The pans were observed to present a white coloured substrate with the dried-up clays being white due to the presence of precipitated salts.	Alluvial deposits and Redoximorphic features such as mottling were present at the edges/borders of the floodplain

Three modules, namely hydrology, geomorphology and vegetation, were assessed as a single unit for the HGM Units and subsequently an area weighted score was obtained for the HGM Units. The potential impacts of activities such as agriculture, drought, prospecting, mining, altered hydrological functions and clearing of natural vegetation within the greater catchment were taken into consideration during the assessment. The results are summarised below;

Wetland	Hydrology Module		Geomorphology Module		Water Quality		Vegetation Module		Overall PES Score
	Impact Score	Trajectory of Change	Impact Score	Trajectory of Change	Impact Score	Trajectory of Change	Impact Score	Trajectory of Change	
Depressions	A	→	A	→	A	→	C	→	B
FP	C	→	B	→	A	→	C	→	B

The overall PES Category for the assessed wetlands is a B, which means the systems are largely natural with few modifications, but with some loss of natural habitats. Minimal change in ecosystem processes and loss of natural habitat has occurred but the natural habitat remains intact. The loss of natural habitat within the Floodplain is largely attributed to the historic and current mining activities that are occurring upstream of the wetland system. The wetland is currently in a modified state due to the lack of mitigation measures and rehabilitation being implemented. This resulted in increased sediment loads being transported downstream, affecting the system. Major impacts within the Depressions result from grazing and a dirt road traversing the wetland area. With that being noted, no other major impacts were observed within the study area and associated wetlands. The study area can be considered to be in a natural state. A potential decrease in the PES is likely to occur over the next few years if the prospecting activities occur within the exclusion zones, if further road construction takes place, and if further degradation of the catchment area occurs.

See full Report in **Appendix 12**

Milnex CC: BAR262PR – BAR & EMP: Environmental Authorisation Application of Mr Petrus Van Der Walt Vermeulen for the proposed Prospecting Right for the prospecting of Diamonds Alluvial (DA), Diamonds General (D), Diamonds in Kimberlite (DK) and Diamonds (DIA including associated infrastructure, structure and earthworks on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD.

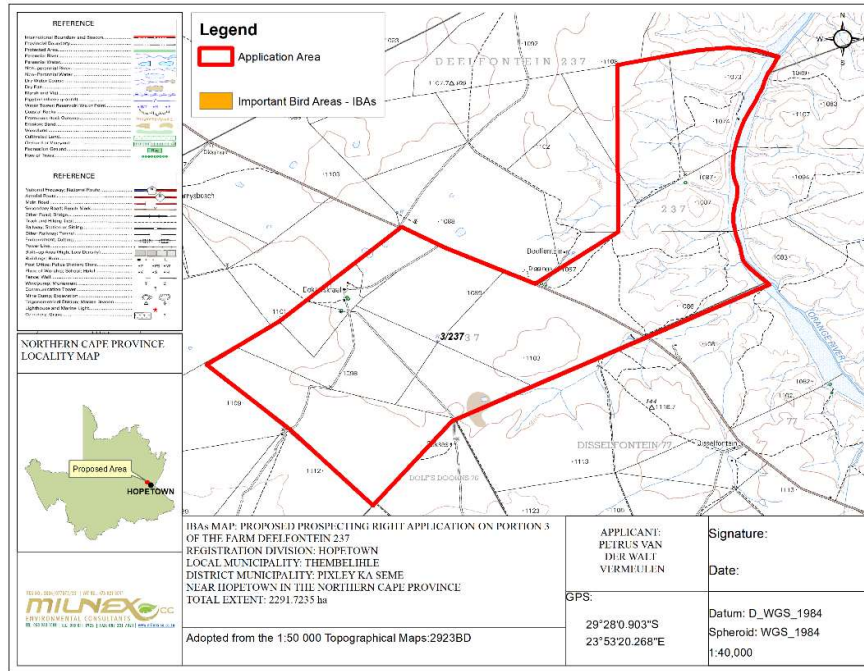


Figure 16: Important Bird and Biodiversity Areas associated with the study site.

Many avifaunal species are adaptable as they are habitat generalists and can therefore accommodate a certain degree of habitat degradation and transformation (Harrison *et al.*, 1997). Other species are extremely habitat specific and have to rely on certain habitat units for breeding, hunting or foraging and roosting. It is the survival of these species that become threatened as they cannot adapt to habitat changes. Habitat-specific species are sensitive to environmental change, with destruction of habitat being the leading cause of species decline worldwide (Barnes, 2000).

It is widely accepted that vegetation structure, rather than the actual plant species, influences bird species' distribution and abundance (Harrison *et al.*, 1997). Therefore, the vegetation description used in the Bird Atlas does not focus on lists of plant species, but rather on factors which are relevant to bird distribution. After generating a screening report of the study site, it was observed that the Near threatened *Neotis ludwigii* (Ludwig's Bustard) is expected to occur within the region.

Ludwig's Bustards are adapted to flat, open, semi-arid shrublands of the succulent Karoo, Nama karoo and Namib. Depending on rainfall, these birds can be found in cultivated fields and pastures. Suitable breeding and feeding habitats influencing distribution were observed on site and described as grass and low shrubland (Taylor *et al.*, 2015). Birds which potentially occur in the study area and enjoy conservation status in the IUCN Red List are presented in the table below.

Scientific Name	Common Name	Red Data List Category	Likelihood of Occurrence
<i>Sagittarius serpentarius</i>	Secretary bird	EN	Occurs on site
<i>Circus maurus</i>	Black Harrier	EN	High likelihood
<i>Neotis Ludwigii</i>	Ludwig's Bustard	EN	Anecdotal occurrence
<i>Oxyura maccoa</i>	Maccoa Duck	VU	Possible
<i>Gyps africanus</i>	White-backed Vulture	CR	Possible
<i>Torgos tracheliotos</i>	Lappet-faced Vulture	EN	Possible
<i>Gyps coprotheres</i>	Cape Vulture	EN	High likelihood
<i>Polemaetus bellicosus</i>	Martial Eagle	EN	Possible

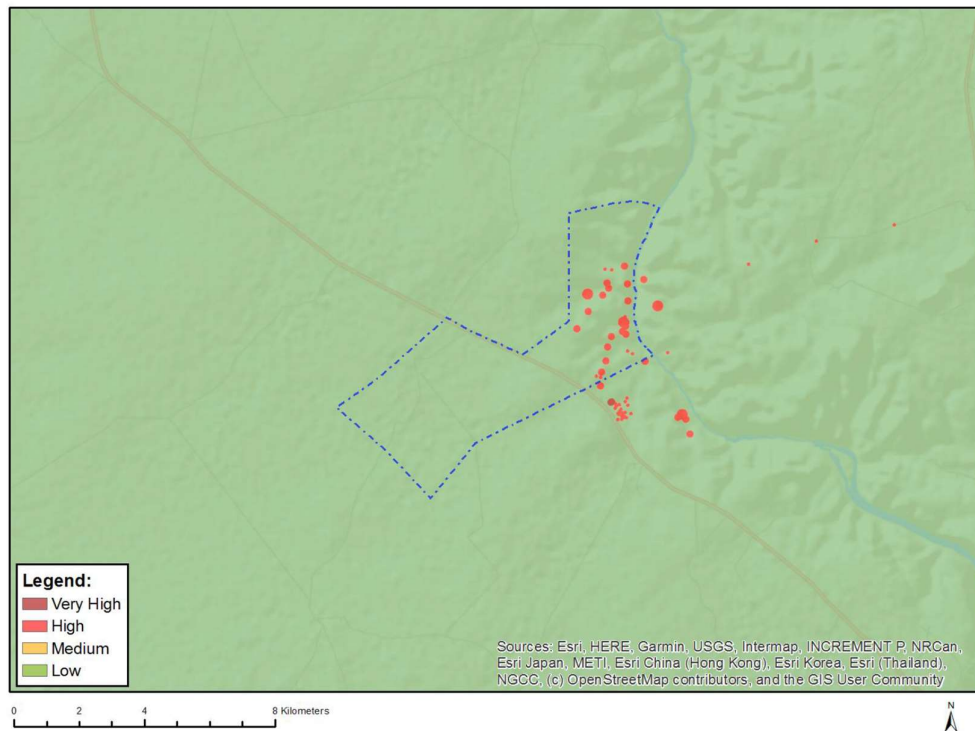
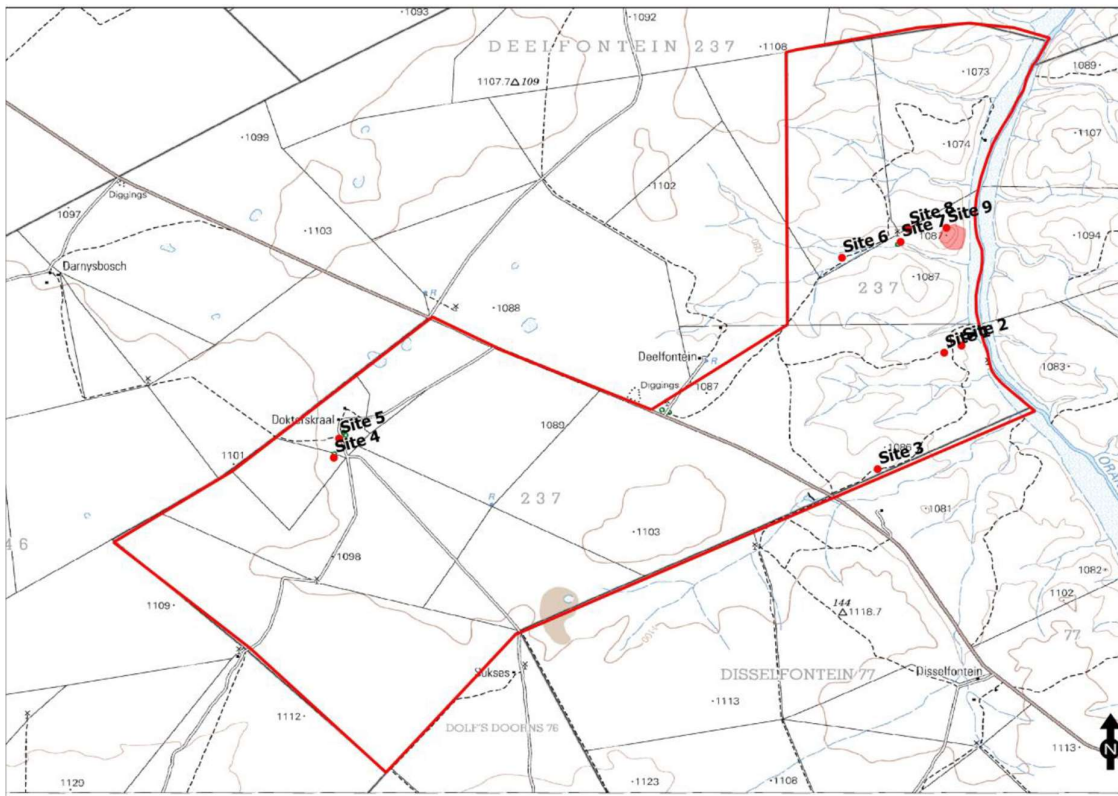


Figure 18: Archaeological and Cultural Heritage Combined Sensitivity

A total of nine sites were recorded during the survey which include one graveyard (Site 6) and six historical farmhouse complexes and other historical structures (Sites 1, 3, 4, 5, 7 and 8) and two large rock art sites (Sites 2 and 9). The historical farmhouses and other associated structures mostly date to the late 1800s to early 1900s and are associated with early farming activities. However, some of the headstones in the graveyard date to early 1800s which indicate a possible earlier occupation window in area. Early maps confirm that by the late 19th century the farms were already well established. Please note that the Doctor's Kraal complex is associated with a veterinary service that was provided probably from the 1890s. Although most sites correlate or overlap, note that the survey conducted by Van Ryneveld (2013a) recorded a total of 27 sites. This adds to the high density of the distribution of heritage sites on the farm.

See figure below indicating the sites that were recorded



See the location, significance of findings, impacts and proposed mitigation in the table below:

Site No	Coordinates	Site Type	Field Rating of Significance	Impact	Proposed Mitigation
1	29.458193°S 23.912786°E	Historical livestock enclosures	Generally protected C: Low significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
2	29.457519°S 23.914426°E	Rock Art (engravings)	Generally protected A: High significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
3	29.469229°S 23.906471°E	Historical livestock enclosures	Generally protected C: Low significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
4	29.468153°S 23.854902°E	Historical livestock enclosure	Generally protected B: Medium significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
5	29.466334°S 23.855395°E	Historical farmhouse complex	Generally protected B: Medium significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
6	29.449192°E 23.903092°E	Graveyard	Generally protected A: High significance	High	<ul style="list-style-type: none"> Fenced off and gate installed Maintain a buffer zone of 50 metres during prospecting phase
7	29.447688°S 23.908647°E	Historical livestock enclosures (with spring)	Generally protected C: Low significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
8	29.446466°S 23.909378°E	Historical farm house complex with enclosures	Generally protected C: Low significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase
9	29.446350°S 23.912996°E	Rock art (engravings)	Generally protected A: High significance	High	<ul style="list-style-type: none"> Maintain a buffer zone of 50 metres during prospecting phase

In this regard please note the following proposed mitigation measures:

- ▣ Take note of the position of the existing heritage sites;
- ▣ A buffer zone of 50 metres should be maintained;

- ▣ The graveyard should be fenced off with a gate installed; and
- ▣ Care should be taken to prevent any indirect impacts on the historical structures.

It is therefore recommended, from a cultural heritage perspective that the proposed prospecting initiatives may proceed, dependent on adherence to the proposed mitigation measures. Also, please note:

If the exhumation and reburial of the graveyards are envisaged it will entail social consultation and permit application. Other legislative measures which may be pertinent include the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003, Ordinance on Exhumations (Ordinance No. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place. Note that unmarked graves are by default regarded as older than 60 years and therefore falls under the NHRA (Act No. 25 of 1999, Section 36).

Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place (cf. NHRA (Act No. 25 of 1999), Section 36 (6)).

According to the DEA Screening Report a certain area of the proposed area falls within high Paleontology Theme Sensitivity. The rest of the area falls within a medium and low sensitive area. Please see map colour map under **Appendix 7**.

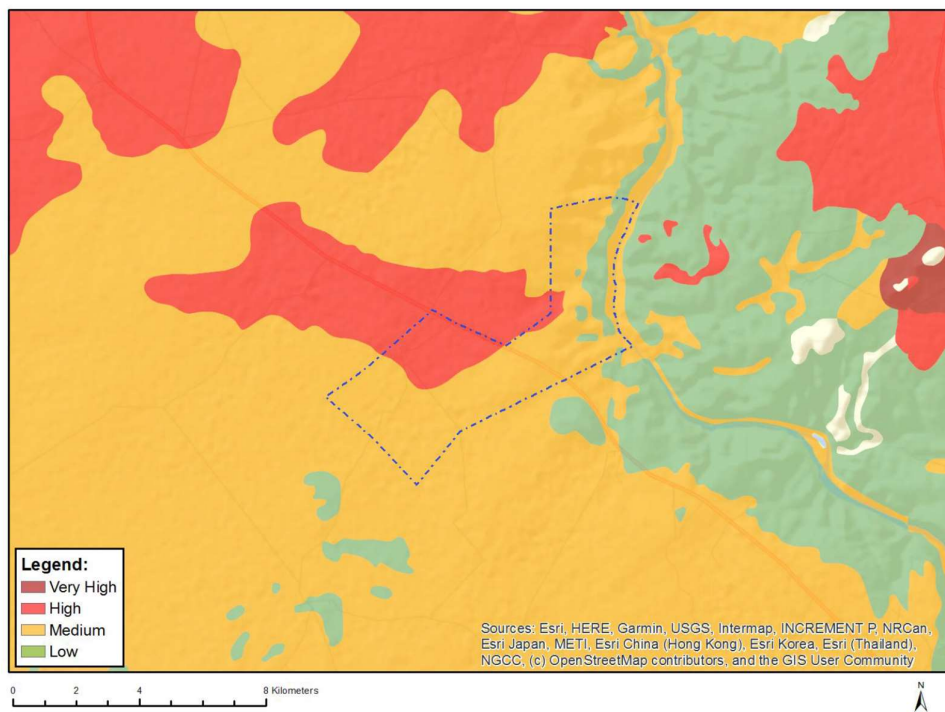
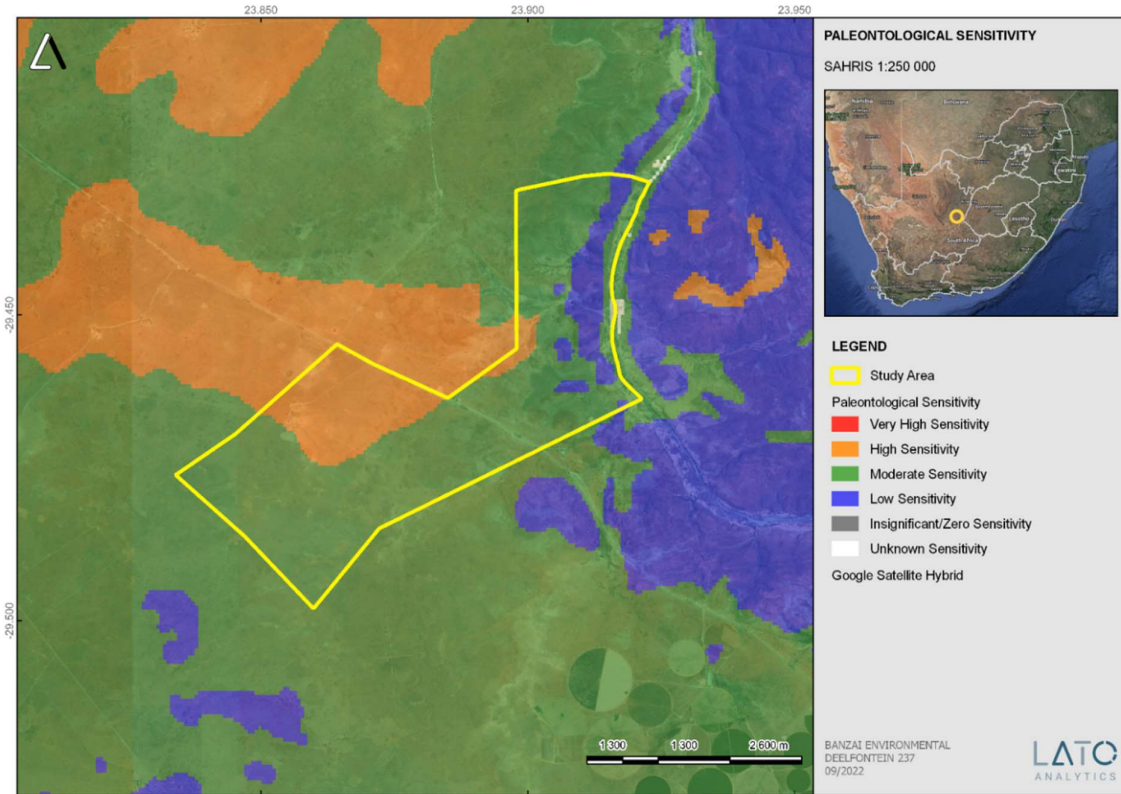


Figure 19: Relative Paleontology Theme Sensitivity

According to the SAHRIS Palaeosensitivity map the proposed development is underlain by sediments with a High (orange), Moderate (green), Low (blue) Palaeontological Significance.



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

Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA)**. According to Section 3 of the Act, all Heritage resources include “**all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**”.

If such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately and work must stop.

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.

Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.

- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

Description of the socio-economic environment

- **Socio-economic conditions**

The Pixley Ka Seme District Municipality is a Category C municipality situated in the south-east of the Northern Cape Province. It shares its borders with three other provinces, namely the Free State to the east, the Eastern Cape to the south-east, and the Western Cape to the south-west. It is the second-largest district of the five in the province, but makes up almost a third of its geographical area. The district is comprised of eight local municipalities: Ubuntu, Umsobomvu, Emthanjeni, Kareeberg, Renosterberg, Thembelihle, Siyathemba and Siyancuma. Its main town is De Aar. Traffic flows through the region, linking the major industrial areas of the country. The area has a low rainfall, while the largest river in South Africa flows through it. Two of the major dams in South Africa, the Vanderkloof and Gariiep Dams, are situated on the borders of the district municipality

Thembelihle Local Municipality

Key Statistics Summary

Demographic Information

	2016	2011
Population	16 230	15 701
Age Structure		
Population under 15	25.0%	30.9%
Population 15 to 64	68.5%	62.8%
Population over 65	6.5%	6.4%
Dependency Ratio		
Per 100 (15-64)	46.0	59.3
Sex Ratio		
Males per 100 females	104.6	103.3
Population Growth		
Per annum	0.75%	n/a
Labour Market		
Unemployment rate (official)	n/a	28.4%
Youth unemployment rate (official) 15-34	n/a	35.2%
Education (aged 20 +)		
No schooling	10.8%	15.1%
Matric	22.2%	19.9%
Higher education	5.0%	6.6%

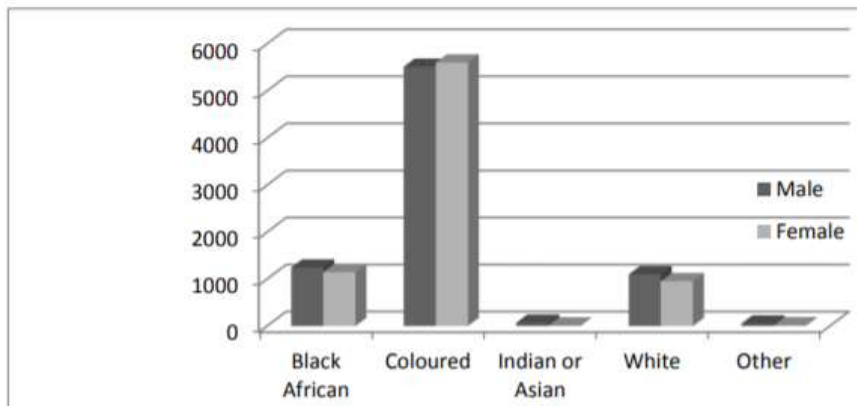
Household Dynamics		
Households	4 736	4 140
Average household size	3.4	3.7
Female headed households	32.4%	32.3%
Formal dwellings	77.4%	77.5%
Housing owned	51.0%	51.4%
Household Services		
Flush toilet connected to sewerage	66.4%	60.0%
Weekly refuse removal	59.4%	68.4%
Piped water inside dwelling	39.9%	33.5%
Electricity for lighting	84.2%	75.2%

The chart below shows the population growth from 2011 to 2016 in the Thembelihle Local Municipality.

Population Census 2011

	Male	Female	Grand Total
Black African	1245	1146	2391
Coloured	5511	5601	11112
Indian or Asian	69	12	81
White	1101	954	2055
Other	51	15	66
Grand Total	7977	7728	15705

The population has grown from 15 705 in 2011 to 16 230 in 2016, which represents a population growth of 0.75% per annum. See the below figure for the demographics of the municipality.



Employment status across population groups

	Black African		Coloured		Indian or Asian		White		Other		Grand Total
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
Employed	468	243	1332	906	36	3	483	345	42	3	3861
Unemployed	111	126	600	672	-	-	12	6	-	-	1527
Discouraged work-seeker	33	57	195	381	3	-	3	12	-	-	684
Other not economically active	264	333	1203	1470	18	3	186	291	6	6	3780
Age less than 15 years	-	-	-	-	-	-	-	-	-	-	-
Not applicable	372	387	2178	2172	12	6	420	294	-	-	5841
Grand Total	1248	1146	5508	5601	69	12	1104	948	48	9	15693

Piped Water by Source of Water for households

Piped Water by Source of Water for Household : NC076: THEMBELIHLE

	Regional/local water scheme (operated by municipality or other water services provider)	Borehole	Spring	Rain water tank	Dam/pool/stagnant water	River/stream	Water vendor	Water tanker	Other
Piped (tap) water inside dwelling/institution	1131	174	-	3	3	75	-	6	-
Piped (tap) water inside yard	1254	480	-	-	15	33	-	30	-
Piped (tap) water on community stand: distance less than 200m from dwelling/institution	396	57	3	-	6	3	3	-	-
Piped (tap) water on community stand: distance between 200m and 500m from dwelling/institution	288	3	-	-	-	-	-	-	-
Piped (tap) water on community stand: distance between 500m and 1000m (1km) from dwelling/institution	39	21	-	-	-	-	-	-	-
Piped (tap) water on community stand: distance greater than 1000m (1km) from dwelling/institution	6	93	-	-	-	-	-	-	-
No access to piped (tap) water	3	3	-	-	-	3	-	3	3
Unspecified	-	-	-	-	-	-	-	-	-

Toilet facilities

Toilet facilities

for Household weighted, NC076: Thembelihle

None	429
Flush toilet (connected to sewerage system)	2484
Flush toilet (with septic tank)	222
Chemical toilet	18
Pit toilet with ventilation (VIP)	456
Pit toilet without ventilation	486
Bucket toilet	9
Other	36
Unspecified	-
Not applicable	-
Grand Total	4140

Type of dwelling by refuse removal

	Removed by local authority/private company at least once a week	Removed by local authority/private company less often	Communal refuse dump	Own refuse dump	No rubbish disposal	Other	Unspecified	Not applicable
House or brick/concrete block structure on a separate stand or yard or on a farm	2385	33	72	534	45	21	-	-
Traditional dwelling/hut/structure made of traditional materials	9	-	-	-	-	3	-	-
Flat or apartment in a block of flats	30	-	-	6	3	-	-	-
Cluster house in complex	3	-	-	-	-	-	-	-
Townhouse (semi-detached house in a complex)	3	-	-	-	-	-	-	-
Semi-detached house	-	-	-	-	3	-	-	-
House/flat/room in backyard	15	-	6	3	-	-	-	-
Informal dwelling (shack; in backyard)	54	-	-	3	3	-	-	-
Informal dwelling (shack; not in backyard; e.g. in an informal/squatter settlement or on a	252	-	111	18	420	12	-	-

Thembelihle FINAL IDP / MAY / for wider municipal area 2016/2017 Page 18

farm)								
Room/flatlet on a property or larger dwelling/servants quarters/granny flat	45	-	-	3	-	-	-	-
Caravan/tent	6	-	-	-	-	-	-	-
Other	33	-	3	-	-	-	-	-
Unspecified	-	-	-	-	-	-	-	-
Not applicable	-	-	-	-	-	-	-	-

Description of the current land uses.

According to Figure 20 and Figure 21 the proposed area is mostly covered by Low shrubland, Grassland, Ticklet/Dense Bush and some bare non vegetated areas. According to the Landcover Map, the area is mostly natural (Figure 20 or 21)

Milnex CC: BAR262PR – BAR & EMP: Environmental Authorisation Application of Mr Petrus Van Der Walt Vermeulen for the proposed Prospecting Right for the prospecting of Diamonds Alluvial (DA), Diamonds General (D), Diamonds in Kimberlite (DK) and Diamonds (DIA) including associated infrastructure, structure and earthworks on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD.

If applicable a Water Use License Application will be launched for conducting prospecting operations.

All infrastructure will be temporary and/or mobile.

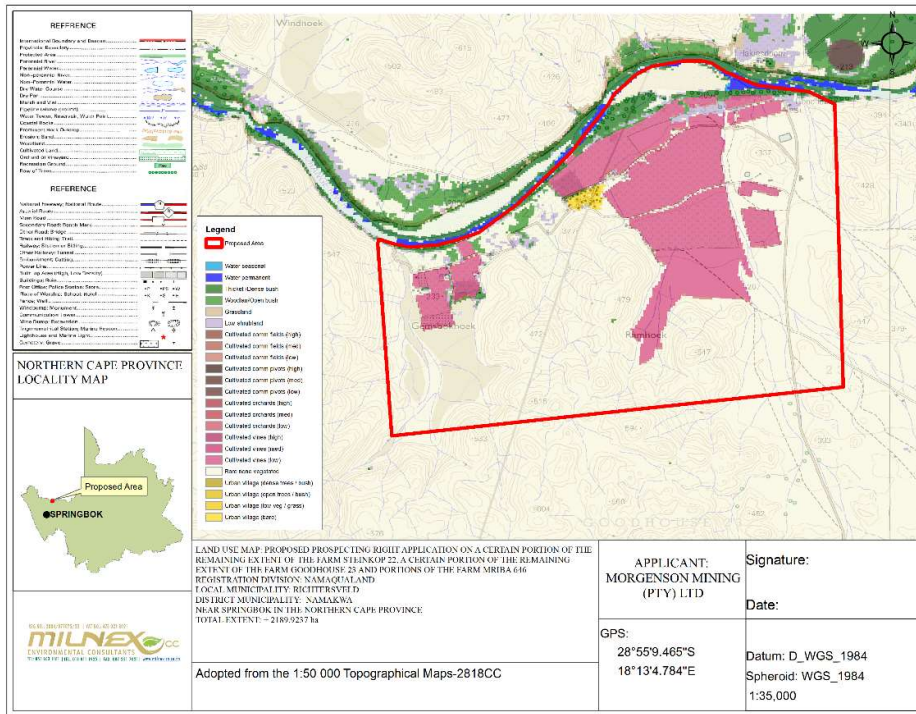


Figure 20: Land use map associated with study site and surrounding areas.

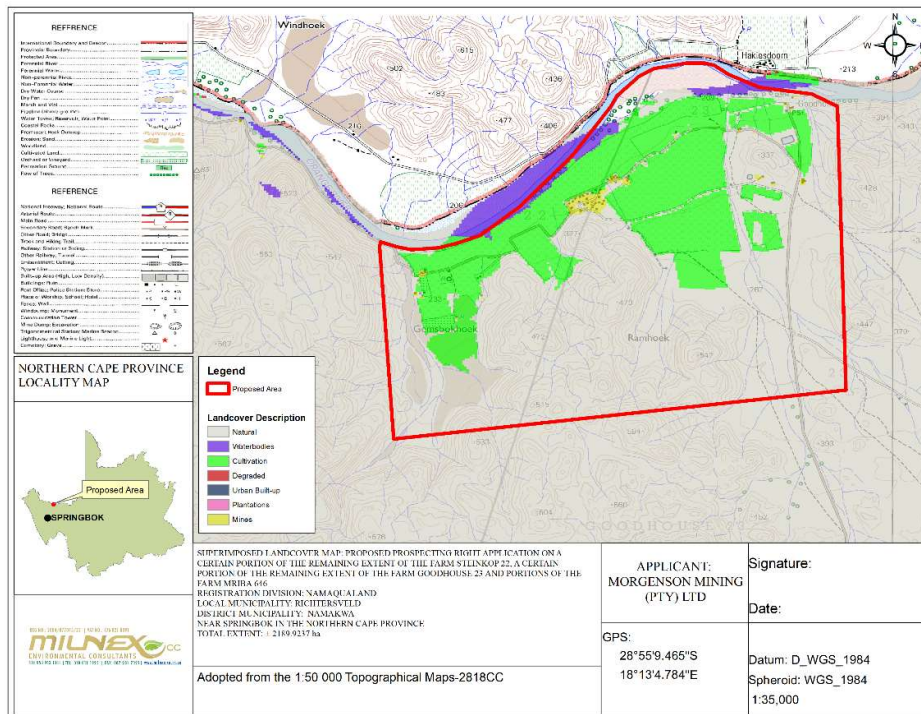


Figure 21: Landcover map associated with study site and surrounding areas.

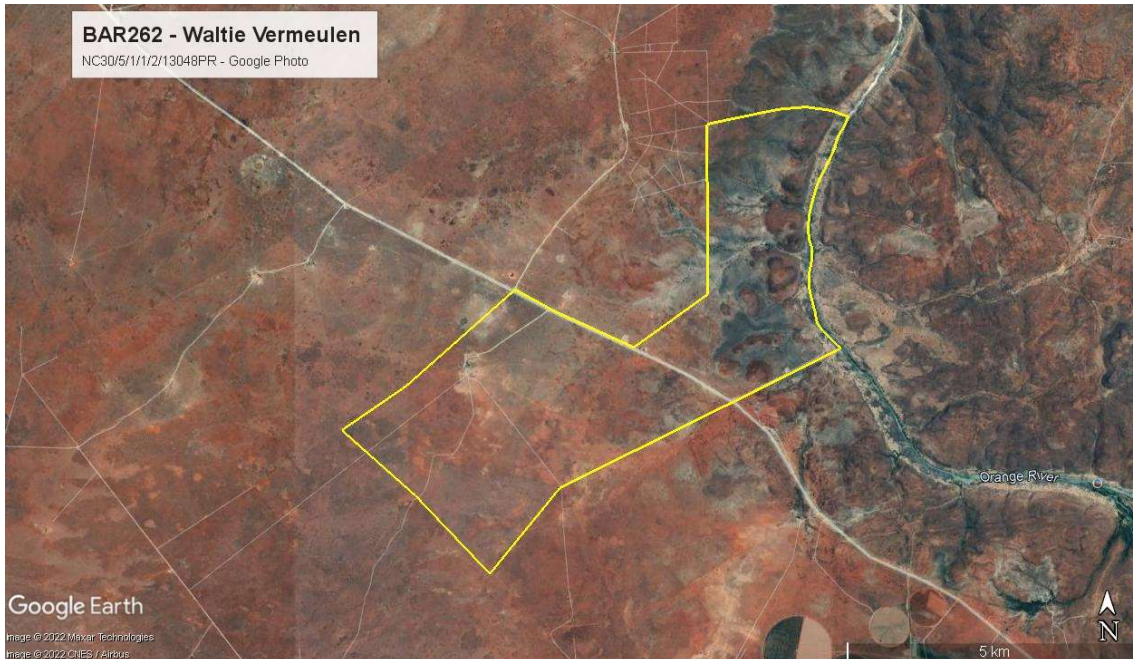


Figure 22: Google earth map of the proposed area.

v) **IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTENT, DURATION AND PROBABILITY OF THE IMPACTS, INCLUDING THE DEGREE TO WHICH THESE IMPACTS -**

- (aa) can be reversed;
- (bb) may cause irreplaceable loss of resources; and
- (cc) can be avoided, managed or mitigated;

Significance of potential impacts

The following sections present the outcome of the significance rating exercise. The results suggest that the prospecting activities will have an impact on the natural vegetation and the agricultural activities, if not properly mitigated.

INITIAL CLEARANCE AND SITE PREPARATION PHASE

Direct impacts: During this phase minor negative impacts are foreseen over the short term. The latter refers to a period of weeks. The site preparation may result in the loss or fragmentation of Ecological habitats, soil erosion, hydrology, and temporary noise disturbance, generation of waste, visual intrusions, increase in heavy vehicle traffic, and risk to safety, livestock and farm infrastructure, and increased risk of veld fires. The abovementioned impacts are discussed in more detail below:

- **Ecological Impacts**

The proposed area falls within vegetation units: Kimberley Thornveld, Northern Upper Karoo, Upper Gariep Alluvial Vegetation & Vaalbos Rocky Schrubland, see the description below:

Kimberley Thornveld

Conservation Least threatened. Target 16%. Only 2% statutorily conserved in Vaalbos National Park as well as in Sandveld, Bloemhof Dam and S.A. Lombard Nature Reserves. Some 18% already transformed, mostly by cultivation. Erosion is very low. Area is mostly used for cattle farming or game ranching. Overgrazing leads to encroachment of *Acacia mellifera* subsp. *detinens* (Mucina & Rutherford, 2006).

Northern Upper Karoo

Conservation Least threatened. Target 21%. None conserved in statutory conservation areas. About 4% has been cleared for cultivation (the highest proportion of any type in the Nama-Karoo) or irreversibly transformed by building of dams (Houwater, Kalkfontein and Smart Syndicate Dams). Areas of human settlements are increasing in the northeastern part of this vegetation type (Hoffman et al. 1999). Erosion is moderate (46.2%), very low (32%) and low (20%). *Prosopis glandulosa*, regarded as one of the 12 agriculturally most important invasive alien plants in South Africa, is widely distributed in this vegetation type (Hoffman et al. 1999). *Prosopis* occurs in generally isolated patches, with densities ranging from very scattered to medium (associated with the lower Vaal River drainage system and the confluence with the Orange River) to localised closed woodland on the western border of the unit with Bushmanland Basin Shrubland (Mucina & Rutherford, 2006).

Upper Gariep Alluvial Vegetation

Conservation Least threatened. Target 16%. Less than 2% statutorily conserved in the Vaalbos National Park. Only about 2% already transformed (Mucina & Rutherford, 2006).

Vaalbos Rocky Schrubland

Conservation Least threatened. Target 16%. Less than 2% statutorily conserved in the Vaalbos National Park. Only about 2% already transformed (Mucina & Rutherford, 2006).

DEA Screening Report findings:

- *Plant Species theme sensitivity*: Low throughout the study area
- *Aquatic Biodiversity sensitivity*: Very High on the proposed area where water bodies have been identified and low throughout most of the study area
- *Terrestrial Biodiversity sensitivity*: Very High on eastern part of the proposed area and low throughout the rest of the area
- *Animal Species sensitivity*: Medium throughout the area

PWP

The Prospecting Work Programme (PWP) states 200 boreholes will be drilled [impact: 2m (length) x 2m (breath)] and 50 pits [3m (length) x 2m (breath) x 4m (depth)] will be dug. This calculates to a disturbance of ± 0.11 ha

The whole application area is 2291.7235 ha thus the 0.11ha disturbance is very small compared to the size of the application area.

- Loss destruction or fragmentation of habitats – According to **Figure 20 and Figure 21** the proposed area is mostly covered by Low scrubland, Grassland, Ticket/Dense Bush and some bare non vegetated areas. According to the Landcover Map, the area is mostly natural (Figure 20 or 21)

PWP

The Prospecting Work Programme (PWP) states 200 boreholes will be drilled [impact: 2m (length) x 2m (breath)] and 50 pits [3m (length) x 2m (breath) x 4m (depth)] will be dug. This calculates to a disturbance of ± 0.11 ha

The whole application area is 2291.7235 ha thus the 0.11ha disturbance is very small compared to the size of the application area.

Potential Environmental Impact	Environmental Impact Before Mitigation					Significance	Environmental Impact After Mitigation					Significance
	Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration		Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration	
Changing the physical structure within a water resource (habitat)	4	1	2	1	1	20 Very Low	4	1	2	1	1	20 Very Low
Alteration of the amount of sediment entering the water resource and associated change in turbidity	4	1	2	1	1	20 Very Low	4	1	2	1	1	20 Very Low
Alteration of water quality	4	1	1	1	1	15 Very Low	4	1	1	1	1	15 Very Low
Loss of terrestrial habitat	4	2	3	1	1	30 Low	4	2	3	1	1	30 Low
Loss of Aquatic Biota	4	1	1	1	1	15 Very Low	4	1	1	1	1	15 Very Low
Loss of Terrestrial Fauna	4	2	1	1	1	18 Very Low	4	2	1	1	1	18 Very Low
Loss of Terrestrial Flora	4	2	2	1	1	24 Very Low	4	2	2	1	1	24 Very Low
Introduction and spread of alien vegetation	4	2	3	1	1	30 Low	4	2	3	1	1	30 Low

Please note that the Impact Assessment Methodology for the Ecological Impacts differ from the methodology discussed in this Basic Assessment Report. The reason for this is that the methodology uses for the Terrestrial Biodiversity and Wetland assessment best suits this specific aspect.

Mitigation measures are discussed in **Part B of the Basic Assessment Report**

Please find methodology used on page 66-70 of the full Report, attached in **Appendix 12**

- **Loss of topsoil** – Topsoil may be lost due to poor topsoil management (burial, erosion, etc.) during construction related soil profile disturbance (levelling, excavations, disposal of spoils from excavations etc.) The effect will be the loss of soil fertility on disturbed areas after rehabilitation.

Loss of topsoil	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Geographical extent	Site (1)	Site (1)
Probability	Probable (3)	Possible (2)
Duration	Medium term (2)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (1)
Cumulative impact	Medium cumulative impacts (3)	
Significance	Negative low (28)	Negative low (10)

<p>Can impacts be mitigated?</p>	<p>The following mitigation or management measures are provided:</p> <ul style="list-style-type: none"> • If an activity will mechanically disturb below surface in any way, then any available topsoil should first be stripped from the entire surface and stockpiled for re-spreading during rehabilitation. • Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them. • Dispose of all subsurface spoils from excavations where they will not impact on undisturbed land. • During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface. • Erosion must be controlled where necessary on top soiled areas. <p>Establish an effective record keeping system for each area where soil is disturbed for constructional purposes. These records should be included in environmental performance reports, and should include all the records below.</p> <ul style="list-style-type: none"> • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation of constructional (or operational) activities at the particular site. • Photograph the area on cessation of constructional activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time. <p>Section (f) of the EMPr also provide mitigation measures related to topsoil management.</p>
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- Soil erosion – Soil erosion due to alteration of the land surface run-off characteristics. Alteration of run-off characteristics may be caused by construction related land surface disturbance, vegetation removal and the establishment of roads. Erosion will cause loss and deterioration of soil resources. This will result in grazing and cultivation areas being lost.

Soil erosion	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Geographical extent	Site (1)	Site (1)
Probability	Possible (2)	Possible (2)
Duration	Long term (3)	Medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Barely reversible (3)	Completely reversible (1)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal (2)
Cumulative impact	Medium cumulative impact (3).	
Significance	Negative Medium (30)	Negative low (22)
Can impacts be mitigated?	<p>The following mitigation or management measures are provided:</p> <ul style="list-style-type: none"> • Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water 	

	<p>from all hardened surfaces and prevents potential down slope erosion.</p> <ul style="list-style-type: none"> • Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly. <p>Include periodical site inspection in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence any erosion on site or downstream – refer to section (f) of the EMPr..</p>
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- Temporary noise disturbance - Preparation activities will result in the generation of noise over a period of months. Sources of noise are likely to include vehicles, the use of machinery such as excavators & and people working on the site. The noise impact is unlikely to be significant; but activities should be limited to normal working days and hours (6:00 – 18:00). Agricultural activities in the area also contribute to noise disturbance.

Temporary noise disturbance	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Probable (3)	Possible (2)
Duration	Short term (1)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Negligible cumulative impact (1).	
Significance	Negative low (18)	Negative low (8)
Can impacts be mitigated?	Yes, management actions related to noise pollution are included in section (f) of the EMPr.	

- Generation of waste - general waste, construction waste, sewage and grey water - The workers on site are likely to generate general waste such as food wastes, packaging, bottles, etc. Construction waste is likely to consist of packaging, scrap metals, waste cement, etc (if any). The applicant will need to ensure that general and construction waste is appropriately disposed of i.e. taken to the nearest licensed landfill. Sufficient ablution facilities must be provided, in the form of portable/VIP toilets.

Generation of waste	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2) - An additional demand for landfill space could result in significant cumulative impacts if services become unstable or unavailable, which in turn would negatively impact on the local community	
Significance	Negative low (20)	Negative low (7)

Can impacts be mitigated?	Yes, it is therefore important that all management actions and mitigation measures included in section (f) of the EMP are implemented.
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Impacts on heritage & Paleontological objects –

Heritage objects

According to the DEA Screening Report the Archaeological and Cultural Heritage Theme Sensitivity is low and the Paleontology Theme Sensitivity falls mostly within medium sensitivity.

Survey: A graveyard (Site 6), six historical farmhouse complexes and other historical structures (Sites 1, 3, 4, 5, 7 and 8) and two large rock art sites (Sites 2 and 9)		
	Without mitigation	With mitigation
Prospecting Phase		
<i>Probability</i>	Definite (5)	Very Improbable (1)
<i>Duration</i>	Permanent (5)	Short term (2)
<i>Extent</i>	Limited to the site (1)	Limited to the site (1)
<i>Magnitude</i>	Very High (10)	Minor (2)
Significance of Impact	80 (High)	5 (Low)
<i>Status (positive or negative)</i>	Negative	Positive
Reversibility	Low	Low
<i>Irreplaceable loss of resources?</i>	Yes	None
<i>Cumulative impacts and indirect impacts</i>	Prospecting phase may cause excessive vibrations.	
<i>Can impacts be mitigated?</i>	Yes, buffer zones (50 metres) should be maintained during prospecting developments	

Paleontological objects

	Site	Probability	Duration	Magnitude	Reversibility	Irreplicable Loss	Cumulative Effect	Significance
	1	2	4	1	4	4	2	17

Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA)**. According to Section 3 of the Act, all Heritage resources include “**all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**”.

If such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately and work must stop.

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.
- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.

Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.

- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

Indirect impacts: The nuisance aspects generally associated with the installation of infrastructure or ground preparation will also be applicable to this development, which relates primarily to the increase in vehicle traffic associated with prospecting practices, the influx of job seekers to the area, risk to safety, livestock and farm infrastructure, and increased risk of veld fires.

- Increase in vehicle traffic – The movement of heavy vehicles have the potential to damage local farm roads and create dust and safety impacts for other road users in the area. Access will be obtained from existing gravel roads off the R3112. The volume of traffic along this road is **Low** and the movement of heavy vehicles along this road is likely to damage the road surface and impact on other road users.

Increase in vehicle traffic	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2). If damage to roads is not repaired, then this will affect the surrounding road users, and result in higher maintenance costs for vehicles of the road users. The costs will be borne by road users who were not responsible for the damage.	
Significance	Negative Low (20)	Negative low (9)
Can impacts be mitigated?	<p>The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include:</p> <ul style="list-style-type: none"> • The contractor must ensure that damage caused by construction on the off-gravel roads. The costs associated with the repair must be borne by the contractor; • Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers; • All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits. <p>Also refer section (f) of the EMP. For mitigation measures related to traffic.</p>	

- Risk to safety, livestock / game and infrastructure - The presence on and movement of workers on and off the site poses a potential safety threat to the natural area and the communities in the vicinity of the site. In addition, infrastructure, such as fences and gates, may be damaged and livestock losses may also result from gates being left open and/or fences being damaged or livestock theft linked either directly or indirectly to the presence of mine workers on the site.

Risk to safety, livestock and infrastructure	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)
Probability	Possible (2)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)

Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Low cumulative effects (2), provided losses are compensated for.	
Significance	Negative low (22)	Negative low (9)
Can impacts be mitigated?	<p>Key mitigation measures include:</p> <ul style="list-style-type: none"> • Mr Petrus Van Der Walt Vermeulen should enter into an agreement with the landowner / local farmers in the area whereby damages to farm property etc. during the construction phase will be compensated for. The agreement should be signed before the construction phase commences; • The construction area should be fenced off prior to the commencement of the construction phase. The movement of construction workers on the site should be confined to the fenced off area; • Contractors appointed by Mr Petrus Van Der Walt Vermeulen should provide daily transport for low and semi-skilled workers to and from the site. This would reduce the potential risk of trespassing on the remainder of the farm and adjacent properties. • Mr Petrus Van Der Walt Vermeulen should hold contractors liable for compensating landowner/local farmers in full for any crop losses / livestock losses and/or damage to infrastructure that can be linked to construction workers. This should be contained in the Code of Conduct to be signed between the proponent, the contractors and neighbouring landowners. The agreement should also cover losses and costs associated with fires caused by construction workers or construction related activities (see below); • The Environmental Management Programme (EMPr) should outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested. • Contractors appointed Mr Petrus Van Der Walt Vermeulen must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms. • Contractors appointed by Mr Petrus Van Der Walt Vermeulen must ensure that construction workers who are found guilty of trespassing, stealing livestock and/or damaging infrastructure are dismissed and charged. This should be contained in the Code of Conduct. All dismissals must be in accordance with South African labour legislation; 	

- Increased risk of veld fires - The presence of construction workers and construction-related activities on the site poses an increased risk of grass fires that could in turn pose a threat to livestock, crops, wildlife, farmsteads and the communities in the area. In the process, infrastructure may also be damaged or destroyed and human lives threatened. The potential risk of grass fires was heightened by the windy conditions in the area, especially during the dry, windy winter months from May to October. In terms of potential mitigation measures, a fire-break should be constructed around the perimeter of the site prior to the commencement of the construction phase. In addition, fire-fighting equipment should be provided on site during the different phase of prospect.

Increased risk of veld fires	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)

Probability	Possible (2)	Possible (2)
Duration	Long term (3)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Irreversible (4)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	Negligible cumulative effects (1), provided losses are compensated for.	
Significance	Negative medium (45)	Negative low (20)
Can impacts be mitigated?	<p>The mitigation measures include:</p> <ul style="list-style-type: none"> • A fire-break should be constructed around the perimeter of the site prior to the commencement of the construction phase; • Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas; • Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy winter months; • Contractor to provide adequate firefighting equipment on-site, including a fire fighting vehicle; • Contractor to provide fire-fighting training to selected construction staff; • No construction staff, with the exception of security staff, to be accommodated on site over night; • As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the firefighting costs borne by farmers and local authorities. 	

OPERATIONAL PHASE

Direct impacts: During the operational phase the study area will serve as a prospecting area and the impacts are generally associated with Ecological disturbances, soil erosion, change in land use, impacts associated with the, increase in storm water runoff, increased consumption of water, visual intrusion, the generation of general waste, leakage of hazardous materials, and the change in the sense of place. The operational phase will also have a direct positive impact through the provision of permanent employment opportunities and facilitating a positive economic growth. The abovementioned impacts are discussed in more detail below:

Potential Environmental Impact	Environmental Impact Before Mitigation					Significance	Environmental Impact After Mitigation					Significance
	Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration		Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration	
Changing the physical structure within a water resource (habitat)	5	4	2	2	4	72 Medium-Low	4	4	2	1	4	56 Medium-Low

Alteration of the amount of sediment entering the water resource and associated change in turbidity	5	4	2	2	4	72 Medium-Low	3	4	2	1	4	49 Low
Alteration of water quality	4	2	1	2	4	42 Low	3	2	1	1	4	30 Low
Loss of terrestrial habitat	5	4	4	2	5	99 Medium-High	4	4	3	1	4	64 Medium-Low
Loss of Aquatic Biota	3	4	3	2	4	63 Medium-Low	2	4	3	1	4	48 Low
Loss of Terrestrial Fauna	4	4	3	2	4	72 Medium-Low	3	4	3	1	4	56 Medium-Low
Loss of Terrestrial Flora	5	4	4	2	4	90 Medium-High	4	4	3	1	4	64 Medium-Low
Introduction and spread of alien vegetation	4	4	4	2	5	88 Medium-High	2	4	2	1	4	42 Low

Please note that the Impact Assessment Methodology for the Ecological Impacts differ from the methodology discussed in this Basic Assessment Report. The reason for this is that the methodology uses for the Terrestrial Biodiversity and Wetland assessment best suits this specific aspect.

Mitigation measures are discussed in **Part B of the Basic Assessment Report**

Please find methodology used on page 66-70 of the full Report, attached in **Appendix 12**

- Soil erosion – The largest risk factor for soil erosion will be during the operational phase when the prospecting activity ensues and soil is left bare until rehabilitation is initiated. Erosion will be localised within the site. This will ultimately lead to the irretrievable commitment of this resource. The measurable effect of reducing erosion by utilizing mitigation measures may reduce possible erosion significantly.

Soil erosion	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Site (1)
Probability	Probable (3)	Possible (2)
Duration	Long term (3)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Low cumulative effects (2), should these impacts occur, there will be a cumulative impact on the air and water resources in the study area in terms of pollution.	
Significance	Negative low (28)	Negative Low (9)
Can impacts be mitigated?	Yes, to avoid soil erosion it will be a good practice to not remove all the vegetation at once but to only clear the area as it becomes necessary and to implement concurrent rehabilitation. <ul style="list-style-type: none"> • The following mitigation or management measures are provided: Implement an effective system of run-off control, where it is required, that 	

	<p>collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion.</p> <ul style="list-style-type: none"> • Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly <p>Also refer to section (f) of the EMPr.</p>
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- Change in land-use – The use of the area for the operation of the prospecting activity will not disturb existing activities on most of the portions as both (existing activities and prospecting activities) can be done concurrently.

Change in land use	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Low cumulative effects (2) – the right holder should enter into a surface use agreement with the landowner to compensate for any financial losses.	
Significance	Negative low (22)	Negative low (10)
Can impacts be mitigated?	<p>The proponent should establish a Rehabilitation Fund to be used to rehabilitate the area once the proposed facility has been decommissioned. The fund should be funded by revenue generated during the operational phase of the project. The motivation for the establishment of a Rehabilitation Fund is based on the experience in the mining sector where many mines on closure have not set aside sufficient funds for closure and decommissioning.</p> <p>Also refer to section (f) of the EMPr.</p>	

- Generation of alternative land use income – Income generated through the potential prospecting without bulk sampling of the minerals applied for will provide the community with increased cash flow and rural livelihood and thereby improve the financial sustainability of farming on site.

Generation of alternative land use income	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Positive	Positive
Geographical extent	Local (2)	Local (2)
Probability	Probable (3)	Probable (3)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3)	
Significance	Positive low (26)	Positive Low (26)
Can impacts be mitigated?	No mitigation required.	

- Increase in storm water runoff – The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion, especially where vegetation will be cleared. Not all the vegetation should be removed at once.

Increase in storm water runoff	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Barely reversible (3)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3) - Should these impacts occur, there will be a cumulative impacts on the wider area.	
Significance	Negative Low (26)	Negative low (9)
Can impacts be mitigated?	Yes. It is therefore important that all management actions and mitigation measures included in section (f) of the EMPr. are implemented to ensure that these impacts do not occur	

- Increased consumption of water – Additional water requirements related to the potable water supply for employees and workers. Water will also be used for dust suppression.

Increased consumption of water	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Probable (3)
Duration	Medium term (3)	Medium term (3)
Magnitude	Low (1)	Low (1)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Marginal loss of resources (2)	Marginal loss of resources (2)
Cumulative impact	Medium cumulative impacts (3) - An additional demand on water sources could result in a significant cumulative impact with regards to the availability of water.	
Significance	Negative low (18)	Negative Medium (17)
Can impacts be mitigated?	Yes, management actions and mitigation measures related to the use of water are included in section (f) of the EMPr.	

- Generation of waste – Workers will be present on site from 6:00 – 18:00, Monday to Saturday. Sources of general waste will be waste food, packaging, paper, etc. General waste will be stored on site in a skip bin with a lid, when the skip bin is full the content must be removed to a license landfill site.

Generation of waste	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Possible (2)
Duration	Medium term (2)	Short term (1)
Magnitude	medium (2)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Marginal of resource (2)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2) - An additional demand for landfill space could result in significant cumulative impacts with regards to the availability of landfill space.	
Significance	Negative low (22)	Negative low (9)
Can impacts be mitigated?	Yes, management actions related to waste management are included in section (f) of the EMPr.	

- Leakage of hazardous materials - The proposed prospecting activity will make use of machinery that use fuel and oil. Leakage of these oils and fuel can contaminate water supplies and must be prevented by constructing oil and diesel permeable bunds to ensure that any spills are suitably attenuated and not released into the environment.

Leakage of hazardous materials	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	The impact would result in negligible to no cumulative effects (1) if mitigation measures and management plans are put in place.	
Significance	Negative low (20)	Negative low (6)
Can impacts be mitigated?	Yes. It is therefore important that all management actions and mitigation measures included in the section (f) of EMP are implemented to ensure that these impacts do not occur.	

- Noise disturbance - Prospecting activities may result in the generation of noise over a period of 5 years. Sources of noise are likely to include vehicles, the use of machinery such as backactors, drill rigs and people working on the site; but prospecting activities should be limited to normal working days and some Saturdays and hours (6:00 – 18:00).

Temporary noise disturbance	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2).	
Significance	Negative low (24)	Negative low (10)
Can impacts be mitigated?	Yes, management actions related to noise pollution are included in section (f) of the EMP.	

Indirect impacts: The operational phase will have an indirect negative impact through the change in the sense of place and an indirect positive impact through the provision of additional electrical infrastructure.

- Potential impact on tourism – There are no tourist facilities in close proximity to the proposed area.

Potential impacts on tourism	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Unlikely (1)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	N/A	N/A
Cumulative impact	N/A	

Significance	Negative low (12)	Negative low (6)
Can impacts be mitigated?	No mitigation required	

DECOMMISSIONING PHASE (MINE CLOSURE AND REHABILITATION)

Direct impacts: Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live. If infrastructures are removed after a 5 year period, the site will be returned to its natural state. Therefore, the physical environment will benefit from the closure of the prospecting area.

Potential Environmental Impact	Environmental Impact Before Mitigation					Significance	Environmental Impact After Mitigation					Significance
	Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration		Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration	
Loss of terrestrial habitat	5	4	4	2	5	99 Medium-High	4	4	3	1	4	64 Medium-Low
Changing the physical structure within a water resource (habitat)	5	4	2	2	4	72 Medium-Low	4	4	2	1	4	56 Medium-Low
Introduction and spread of alien vegetation	4	4	4	2	5	88 Medium-High	2	4	2	1	4	42 Low

Please note that the Impact Assessment Methodology for the Ecological Impacts differ from the methodology discussed in this Basic Assessment Report. The reason for this is that the methodology uses for the Terrestrial Biodiversity and Wetland assessment best suits this specific aspect.

Mitigation measures are discussed in **Part B of the Basic Assessment Report**

Please find methodology used on page 66-70 of the full Report, attached in **Appendix 12**

- Rehabilitation of the physical environment – The physical environment will benefit from the closure of the prospecting area since the site will be restored to its pre-prospecting state. The areas that were prospected must be rehabilitated in such a way that it can support the existing pre-prospecting activity of that specific area. Existing pre-prospecting activities include agricultural activities (livestock grazing & crop production).

Rehabilitation of the physical environment	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Positive	Positive
Extent	Site (1)	Site (1)
Probability	Definite (4)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	High (3)	High (3)
Reversibility	N/A	N/A

Irreplaceable loss of resources	N/A	N/A
Cumulative impact	The impact would result in negligible to no cumulative effects (1)	
Significance	Positive low (27)	Positive low (27)
Can impacts be mitigated?	No mitigation measures required.	

- Loss of employment - The decommissioning of the facility has the potential to have a negative social impact on the local community as it will create job losses.

Loss of employment	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Possible (2)
Duration	Permanent (4)	Long term (3)
Magnitude	Medium (2)	Medium (2)
Reversibility	N/A	N/A
Irreplaceable loss of resources	Significant loss of resource (3)	Significant loss of resource (3)
Cumulative impact	Medium cumulative effects (3)	
Significance	Negative low (28)	Negative low (26)
Can impacts be mitigated?	The following mitigation measures are recommended: <ul style="list-style-type: none"> • All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning; • Mr Petrus Van Der Walt Vermeulen should establish an Environmental Rehabilitation Trust Fund to cover the costs of decommissioning and rehabilitation of disturbed areas. 	

Indirect impacts: No indirect impacts are anticipated from the decommissioning phase of the proposed development.

vi) **METHODOLOGY USED IN DETERMINING AND RANKING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS**

Method of environmental assessment

The environmental assessment aims to identify the various possible environmental impacts that could result from the proposed development. Different impacts need to be evaluated in terms of its significance and in doing so highlight the most critical issues to be addressed.

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in the Table below.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Impact Rating System

Impact assessment must take account of the nature, scale and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the following project phases:

- Construction
- Operation
- Decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact should be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance should also be included. The rating system is applied to the potential impacts on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each impact the following criteria is used:

Table: The rating system

NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).

4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula:

(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.

The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

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)

- Ecological Impacts
- Increased ambient noise levels resulting from increased traffic movement during all prospecting phases.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by communities, landowners and other stakeholders.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on ecosystem functioning.
- Potential decrease in water levels due to abstraction.
- Increased vehicle activity with in the area resulting in the possible destruction and disturbance of fauna and flora.
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime.
- Potential visual impacts caused by prospecting activities without bulk sampling.
- Prospecting will be undertaken by specialist sub - contractors and it is not anticipated that employment opportunities for local and / or regional communities will result from the prospecting activities.
- Prospecting activities may result in localised visual impacts.

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).

Negative impacts on vegetation, soil and the water resources associated with the prospecting activity have been identified through the BAR & EMPr process. Mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B must be implemented in order to minimise these potential impacts.

Noise

Site activities must take place during the day (06:00 – 18:00) to avoid night time noise disturbances and night time collisions with fauna.

Visual impact

Dust suppression measures must be implemented.

Soil

- Disturbances to soil should be limited as far as possible.
- Erosion control measures should be implemented if necessary.
- Oils and lubricants must be stored in lined containment structures.
- Drip trays should be used where necessary.
- Waste bins should be provided and waste should be removed and disposed of at a licensed landfill site.
- Rehabilitation should be done concurrently.

Water

- Before any water is abstracted, a geo-hydro study should be conducted in order to determine the specific yield.
- Oils and lubricants must be stored in lined containment structures.
- Drip trays should be used where necessary.
- Erosion control measures should be implemented if necessary.

Ecological

- Footprint should be kept as minimal as possible
- Mitigation measures in Part B & the Ecological Report should be implemented

ix) MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED.

As discussed in the previous section, the possibility to encounter further Diamond (Alluvial), Diamond (General), Diamonds (Kimberlite) & Diamonds (DIA) on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD, was identified.

x) STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION WITHIN THE OVERALL SITE.

(Provide a statement motivating the final site layout that is proposed)

The site is preferred due to its possibility of having Diamond (Alluvial), Diamond (General), Diamonds & Diamonds (Kimberlite).

I. FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE (IN RESPECT OF THE FINAL SITE LAYOUT PLAN) THROUGH THE LIFE OF THE ACTIVITY.

i. A description of all environmental issues and risks that are identified during the environmental impact assessment process

Process for the identification of key issues

The methodology for the identification of key issues aims, as far as possible, to provide a user-friendly analysis of information to allow for easy interpretation.

- **Checklist:** The checklist consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts.
- **Matrix:** The matrix analysis provides a holistic indication of the relationship and interaction between the various activities, development phases and the impact thereof on the environment. The method aims at providing a first order cause and effect relationship between the environment and the proposed activity. The matrix is designed to indicate the relationship between the different stressors and receptors which leads to specific impacts. The matrix also indicates the specialist studies, which will be submitted as part of the Environmental Impact Report in order to address the potentially most significant impacts.

Checklist analysis

The site visit was conducted to ensure a proper analysis of the site specific characteristics of the study area. The table below provides a checklist, which is designed to stimulate thought regarding possible consequences of specific actions and so assist scoping of key issues. It consists of a list of structured questions related to the environmental parameters and specific human actions. They assist in ordering thinking, data collection, presentation and alert against the omission of possible impacts. The table highlights certain issues, which are further analysed in matrix format.

Table: Environmental checklist

Question	YES	NO	Un-sure	Description
1. Are any of the following located on the site earmarked for the development?				
I. A river, stream, dam or wetland	X			The Orange River borders the East side of the proposed area. According to the Wetland areas map there are 2 Depressions present wetland and there are 2 Unchannelled valley-bottom wetlands on the proposed area. Multiple drainage lines were also identified
II. A conservation or open space area		X		According to the Protected Area map the site does not fall within a Formally Protected area or Threatened Ecosystem.
III. An area that is of cultural importance		X		According to the DEA Screening Report the area falls within a low Archaeological and Cultural Heritage Theme Sensitivity, wit some small areas classified as High (Appendix 7)

IV. Site of geological significance			×	<p>According to the DEA Screening Report a certain area of the proposed area falls within mostly Medium Paleontology Theme Sensitivity and a small area within a high sensitive area. (Appendix 7).</p> <p>If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations of pits the Chance Find must be implemented.</p>
V. Areas of outstanding natural beauty			×	
VI. Highly productive agricultural land			×	<p>According to the Land Capability map the proposed area falls within land capability Class 7 (Appendix 5). However, the proposed area has to knowledge no agricultural fields</p>
VII. Floodplain			×	<p>The Orange River borders the North side of the proposed area. According to the Wetland areas map the Orange River is not classified as a floodplain on this specific section</p>
VIII. Indigenous forest			×	<p>According to Figure 20 and Figure 21 the proposed area is mostly covered by Low shrubland, Grassland, Ticket/Dense Bush and some bare non vegetated areas. According to the Landcover Map, the area is mostly natural (Figure 20 or 21). The property also borders the Orange River on its Eastern boundaries.</p>
IX. Grass land			×	<p>According to Figure 20 and Figure 21 the proposed area is mostly covered by Low shrubland, Grassland, Ticket/Dense Bush and some bare non vegetated areas. According to the Landcover Map, the area is mostly natural (Figure 20 or 21). The property also borders the Orange River on its Eastern boundaries.</p>
X. Bird nesting sites			×	<p>According to the Important Bird and Biodiversity Areas (IBA) map it does not fall within an IBA.</p>
XI. Red data species			×	<p>The proposed areas is mostly natural</p>
XII. Tourist resort			×	
2. Will the project potentially result in potential?				

I. Removal of people		×		None.
II. Visual Impacts	×			The visual impact will be managed
III. Noise pollution	×			The noise impact will be limited to working hours.
IV. Construction of an access road		×		Access will be obtained from existing gravel roads off the 3112.
V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air.		×		
VI. Accumulation of large workforce (>50 manual workers) into the site.		×		Employment opportunities will be created during the different phase of the project
VII. Utilisation of significant volumes of local raw materials such as water, wood etc.		×		The application is for a prospecting right without bulk sampling.
VIII. Job creation	×			Employment opportunities will be created during the different phase of the project
IX. Traffic generation		×		Little to none
X. Soil erosion	×			The application is for a prospecting right without bulk sampling. Soil erosion could occur, mitigation measures are available in the EMPr
XI. Installation of additional bulk telecommunication transmission lines or facilities		×		None.
3. Is the proposed project located near the following?				
I. A river, stream, dam or wetland	×			The Orange River borders the East side of the proposed area. According to the Wetland areas map there are 2 Depressions present wetland and there are 2 Unchannelled valley-bottom wetlands on the proposed area. Multiple drainage lines were also identified
II. A conservation or open space area		×		
III. An area that is of cultural importance			×	
IV. A site of geological significance			×	
V. An area of outstanding natural beauty			×	
VI. Highly productive agricultural land		×		According to the Land Capability map the proposed area falls within land capability Class 7 (Appendix 5). However, the proposed area has to knowledge no agricultural fields. The areas to the south of the area do have some cultivated lands.
VII. A tourist resort			×	
VIII. A formal or informal settlement			×	

Matrix analysis

The matrix describes the relevant listed activities, the aspects of the development that will apply to the specific listed activity, a description of the environmental issues and potential impacts, the significance and magnitude of the potential impacts, and the mitigation of the potential impacts. The matrix also highlights areas of particular concern, which requires more in depth assessment. Each cell is evaluated individually in terms of the nature of the impact, duration and its significance – should no mitigation measures be applied. This is important since many impacts would not be considered insignificant if proper mitigation measures were implemented. The matrix also provides an indication if mitigation measures are available.

In order to conceptualise the different impacts the matrix specify the following:

- **Stressor:** Indicates the aspect of the proposed activity, which initiates and cause impacts on elements of the environment.
- **Receptor:** Highlights the recipient and most important components of the environment affected by the stressor.
- **Impacts:** Indicates the net result of the cause-effect between the stressor and receptor.
- **Mitigation:** Impacts need to be mitigated to minimise the effect on the environment.

J. AN ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

LISTED ACTIVITY (The Stressor)	ASPECTS OF THE DEVELOPMENT /ACTIVITY	POTENTIAL IMPACTS		SIGNIFICANCE AND MAGNITUDE OF POTENTIAL IMPACTS			MITIGATION OF POTENTIAL IMPACTS	SPECIALIST STUDIES / INFORMATION	
		Receptors	Impact description	Minor	Major	Duration	Possible Mitigation		
CONSTRUCTION PHASE									
<p>Listing Notice 1 (GNR 327), Activity 27: "The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation"</p> <p>Listing Notice 3, GNR324, Activity 12: "The clearance of an area of 300 square metres or more of indigenous vegetation. (g) Northern Cape: (ii) Within critical biodiversity areas identified in bioregional plans;</p>	<p>Site clearing and preparation Areas earmarked for prospecting will need to be cleared, topsoil will be stockpiled separately.</p>	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	<ul style="list-style-type: none"> Loss or fragmentation of indigenous natural vegetation. Loss of sensitive species. Loss or fragmentation of habitats. 		-	M	Yes	-
			Air	<ul style="list-style-type: none"> Air pollution due to the increase of traffic. Dust from mining/prospecting activities 	-		M	Yes	-
			Soil	<ul style="list-style-type: none"> Soil degradation, including erosion. Loss of topsoil. Disturbance of soils and existing land use (soil compaction). 	-	-	S	Yes	-
			Geology	<ul style="list-style-type: none"> It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa. 	-		S	Yes	-
			Existing services infrastructure	<ul style="list-style-type: none"> Generation of waste that need to be accommodated at a licensed landfill site. Generation of sewage that need to be accommodated by the local sewage plant. 	-		S	Yes	-
			Ground water	<ul style="list-style-type: none"> Pollution due to construction vehicles. 	-		S	Yes	-
			Surface water	<ul style="list-style-type: none"> Increase in storm water run-off. Pollution of water sources due to soil erosion. Destruction of watercourses (pans/dams/streams/wetlands). 		-	S	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	<ul style="list-style-type: none"> Job creation. Business opportunities. Skills development. 		+	S	Yes	-
			Visual landscape	<ul style="list-style-type: none"> Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility. 	-		L	Yes	-
			Traffic volumes	<ul style="list-style-type: none"> Increase in construction vehicles. 	-		S	Yes	-
			Health & Safety	<ul style="list-style-type: none"> Air/dust pollution. Road safety. Increased risk of veld fires. 		-	S	Yes	-
			Noise levels	<ul style="list-style-type: none"> The generation of noise as a result of construction vehicles, the use of machinery such as drills, excavators, dumper trucks, people working on the site, etc. 	-		L	Yes	-
			Tourism industry	<ul style="list-style-type: none"> Since there are no tourism facilities in close proximity to the site, the construction activities will not have an impact on tourism in the area. 	N/A	N/A	N/A	N/A	-

			Heritage resources	<ul style="list-style-type: none"> Removal or destruction of archaeological and/or paleontological sites. Removal or destruction of buildings, structures, places and equipment of cultural significance. Removal or destruction of graves, cemeteries and burial grounds. 	-		L	Yes	-	
OPERATIONAL PHASE										
<p>Listing Notice 1 (GNR 327), Activity 19: <i>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;</i></p> <p>Listing Notice 1 (GNR 327), Activity 20: <i>“Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] (b) the primary processing of a petroleum resource including winning, extraction, classifying, concentrating or water removal; –</i></p> <p>Listing Notice 1 (GNR 327), Activity 27: <i>“The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation”</i></p> <p>Listing Notice 3, GNR324, Activity 12: <i>“The clearance of an area of 300 square metres or more of indigenous vegetation. (g) Northern Cape: (ii) Within critical biodiversity areas identified in bioregional plans;</i></p>	<p>The key components of the proposed project are described below:</p> <ul style="list-style-type: none"> Supporting Infrastructure - A control facility with basic services such as water and electricity will be constructed on the site and will have an approximate footprint 50m² or less. Other supporting infrastructure includes a site office and workshop area. Roads – Access will be obtained from an existing gravel roads off the N7. Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm. 	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	<ul style="list-style-type: none"> Fragmentation of habitats. Establishment and spread of declared weeds and alien invader plants (operations). 	-		L	Yes	-	
			Air quality	<ul style="list-style-type: none"> Air pollution due to the mining / prospecting activity and transport of the gravel to the designated areas. 	-		S	Yes	-	
			Soil	<ul style="list-style-type: none"> Soil degradation, including erosion. Disturbance of soils and existing land use (soil compaction). Loss of agricultural potential (medium significance relative to agricultural potential of the site). 	-		L	Yes	-	
			Geology	<ul style="list-style-type: none"> Collapsible soil. Seepage (shallow water table). Active soil (high soil heave). Erodible soil. The presence of undermined ground. Instability due to soluble rock. Steep slopes or areas of unstable natural slopes. Areas subject to seismic activity. Areas subject to flooding. 	-		L	Yes	-	
			Existing services infrastructure	<ul style="list-style-type: none"> Generation of waste that need to be accommodated at a licensed landfill site. Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. Increased consumption of water, dust suppression. 	-		L	Yes	-	
			Ground water	<ul style="list-style-type: none"> Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies. 	-		L	Yes	-	
			Surface water	<ul style="list-style-type: none"> Increase in storm water runoff. The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion. Destruction of watercourses (pans/dams/streams/wetlands). Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies. 	-		L	Yes	-	
			SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	<ul style="list-style-type: none"> Job creation. Security guards will be required for 24 hours every day of the week. Skills development. 	-		L	Yes	-
				Visual landscape	<ul style="list-style-type: none"> The proposed portions are used for livestock grazing and crop production which will still take place simultaneously with the prospecting activity, however this depends on the location of the activity. 	-		L	Yes	-
				Traffic volumes	<ul style="list-style-type: none"> Increase in vehicles collecting gravel for distribution. 	-		S	Yes	-
Health & Safety	<ul style="list-style-type: none"> Air/dust pollution. Road safety. 	-			S	Yes	-			

			Noise levels	<ul style="list-style-type: none"> The proposed development will result in noise pollution during the operational phase. 	-		M	Yes	-
			Tourism industry	<ul style="list-style-type: none"> Since there are tourism facilities in close proximity to the site, the decommissioning activities may have an impact on tourism in the area. 	N/A	N/A	N/A	N/A	-
			Heritage resources	<ul style="list-style-type: none"> It is not foreseen that the proposed activity will impact on heritage resources or vice versa. 	N/A	N/A	N/A	N/A	-
DECOMMISSIONING PHASE									
-	<p><u>Mine closure</u> During the mine closure the Mine and its associated infrastructure will be dismantled.</p> <p><u>Rehabilitation of biophysical environment</u> The biophysical environment will be rehabilitated.</p>		Fauna & Flora	<ul style="list-style-type: none"> Re-vegetation of exposed soil surfaces to ensure no erosion in these areas. 		+	L	Yes	-
			Air quality	<ul style="list-style-type: none"> Air pollution due to the increase of traffic of construction vehicles. 	-		S	Yes	-
			Soil	<ul style="list-style-type: none"> Backfilling of all voids Placing of topsoil on backfill 		+	L	Yes	-
			Geology	<ul style="list-style-type: none"> It is not foreseen that the decommissioning phase will impact on the geology of the site or vice versa. 	N/A	N/A	N/A	N/A	-
			Existing services infrastructure	<ul style="list-style-type: none"> Generation of waste that need to be accommodated at the local landfill site. Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. Increase in construction vehicles. 	-		S	Yes	-
			Ground water	<ul style="list-style-type: none"> Pollution due to construction vehicles. 	-		S	Yes	-
			Surface water	<ul style="list-style-type: none"> Increase in storm water run-off. Pollution of water sources due to soil erosion. Destruction of watercourses (pans/dams/streams/wetlands). 	-		S	Yes	-
			Local unemployment rate	<ul style="list-style-type: none"> Loss of employment. 	-		L	Yes	-
			Visual landscape	<ul style="list-style-type: none"> Potential visual impact on visual receptors in close proximity to proposed facility. 	-		S	Yes	-
			Traffic volumes	<ul style="list-style-type: none"> Increase in construction vehicles. 	-		S	Yes	-
			Health & Safety	<ul style="list-style-type: none"> Air/dust pollution. Road safety. Increased crime levels. The presence of mine workers on the site may increase security risks associated with an increase in crime levels as a result of influx of people in the rural area. 	-		L	Yes	-
			Noise levels	<ul style="list-style-type: none"> The generation of noise as a result of construction vehicles, the use of machinery and people working on the site. 	-		S	Yes	-
			Tourism industry	<ul style="list-style-type: none"> Since there are no tourism facilities in close proximity to the site, the decommissioning activities will not have an impact on tourism in the area. 	N/A	N/A	N/A	N/A	-
			Heritage resources	<ul style="list-style-type: none"> It is not foreseen that the decommissioning phase will impact on any heritage resources. 	-		L	Yes	-

(N/A) No impact (+) Positive Impact (-) Negative Impact (S) Short Term (M) Medium Term (L) Long Term

K. WHERE APPLICABLE, A SUMMARY OF THE FINDINGS AND IMPACTS MANAGEMENT MEASURES IDENTIFIED IN AN SPECIALIST REPORT COMPLYING WITH APPENDIX 6 OF THESE REGULATIONS AND AN INDICATION AS TO HOW THESE FINDINGS AND RECOMMENDATIONS HAVE BEEN INCLUDED IN THE FINAL REPORT;

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>Terrestrial Biodiversity & Wetland Assessment</p>	<p>According to the DFFE screening tool report in terms of National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), the site has the following sensitivities:</p> <ul style="list-style-type: none"> • Animal Species Theme: Medium Sensitivity • Aquatic Biodiversity Theme: Very High Sensitivity • Plant Species Theme: Low Sensitivity • Terrestrial Biodiversity Theme: Very High Sensitivity <p>A post-screening site visit was therefore conducted to determine the accuracy of the generated information, and if the studies recommended should be conducted. After the site visit the following was concluded:</p> <ul style="list-style-type: none"> • The site presented a High Sensitivity for the Animal Species Theme due to the vast presence of fauna and faunal habitats and the abundance of species observed on site. Species of conservation concern have a high probability of occurrence due to the lack of human disturbance on the study area. • The Depressions presented a Medium-Low Sensitivity for the Aquatic Species Theme due to the Depressions being seasonally inundated, thus potentially harbouring aquatic biota (macroinvertebrates) during the rainy seasons. The Floodplain wetland presented a High-Medium Sensitivity for the Aquatic Species Theme due to minimal disturbances observed on site. Evidence of aquatic dependent organisms was abundant, therefore indicating that the Floodplain is a good habitat and feeding ground for a lot of organisms. • The site presented a High Plant Species Sensitivity Theme. The Vegetation on site is mostly undisturbed with a few declared invader plant species, which mainly occur at the disturbed footprints around the farmhouses. No plant species of conservation concern was recorded. • The site has a Very High sensitivity from a terrestrial biodiversity perspective because the area is mostly undisturbed and presents habitat conditions suitable for a wide range of faunal species. 		<p>Appendix 12</p>

The information below concludes the Desktop findings supported by field verifications.

- According to the National Threatened Ecosystem database (2011), no threatened ecosystems overlap with the study site.
- According to the Northern Cape Critical biodiversity Areas and map (2016), the study area was observed to overlap with CBA1, CBA 2 and ESA areas.
- According to the National Wetland Map5 Database, three (3) wetland types were expected to occur on the study site. A site visit confirmed the presence of two (2) HGM units. A grass Depression wetland and a Floodplain wetland (Orange River).
- The study area is not found in a Strategic Water Source Area (SWSA).
- Three protected tree species were recorded namely *Boscia albitrunca*, *Vachellia haematoxylon* and *Vachellia erioloba*. Licenses will have to be obtained if any of these trees are to be removed.
- The provincially protected plant species *Aloe claviflora* were recorded on site. Relocation of these plants must be considered
- For Avifaunal species potentially occurring on site, and that enjoy conservation status in the Eskom Red Data Book, kindly refer to Section 4.3.1 (Table 9) for a species list.
- Based on the Reptile Atlas of Africa, the Frog Atlas of South Africa (ADU, 2019) and the DFFE Screening tool, no Herpetofauna SCC are expected to occur on site.
- Results for the wetland assessment are summarised in the table below:

Classification	Scientific Buffer	PES	EIS	REC
Depressions	23m	B	High	A/B Improve
FP	30m	B	High	A/B Improve

The allocation of buffers/exclusion zones was in accordance with the wetlands PES as well as EIS. The allocated buffers can be reviewed. Various potential impacts are associated with the proposed prospecting activities and are discussed in the impact assessment scores derived according to the amended EIA Regulations (2017).

NEMA Impact assessment

The impacts associated with the prospecting activities range from Medium-High to Very-Low prior to mitigation taking place. With mitigation fully implemented, the significance of most impacts can be reduced to Medium-Low to Very-Low

	<p>Mitigation Measures Refer to Section 6.5</p> <p>It is imperative that an effective management plan is implemented to ensure that all mitigation measures discussed in the report are adhered to. It is also important for the operations to be conducted outside of the recommended exclusion buffers. Given the high biodiversity sensitivity of the area, it is recommended that sites with lower biodiversity importance be investigated as alternatives. Thereafter, the proposed prospecting operations can be considered from an ecological conservation point of view. During the construction, operational and decommissioning phases all recommendations made, and concerns raised in this document should be taken into consideration. A good closure and rehabilitation plan should be in place to rehabilitate the habitat for faunal and floral species and active alien and invasive vegetation removal and monitoring should take place in accordance with an Alien Invasive Vegetation Management Plan.</p>		
	<p>The proposed development is underlain by Quaternary sands, Tertiary to Quaternary calcretes, the Dwyka Group (Karoo Supergroup) as well as the Allanridge Formation (Platberg Group, Ventersdorp Supergroup). Updated geology indicates that the development is underlain by is underlain by the calcrete, surface limestone and Hardpan surface deposits as well as the Kalahari Group, Dwyka Group (Karoo Supergroup) as well as the Allanridge Formation (Platberg Group, Ventersdorp Supergroup). According to the South African Heritage Resources Information System, the Palaeontological Sensitivity of the calcrete, surface limestone and Hardpan surface deposits is High, that of the Quaternary sands (Kalahari Group) and Dwyka Group is Moderate, while that of the Allanridge Formation is Low. It is therefore considered that the proposed prospecting will not lead to detrimental impacts on the palaeontological heritage of the area. The construction and operation of the project may be authorised, as the whole extent of the development footprint is not considered sensitive in terms of palaeontological heritage.</p> <p>If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented by the ECO or site manager in charge of these developments. Fossil discoveries ought to be protected and the ECO/site manager must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that suitable mitigation (recording and collection) can be carried out.</p> <p>It is consequently recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils.</p>		<p>Appendix 12</p>

	<p><u>CHANCE FIND PROTOCOL</u></p> <p>The following procedure will only be followed if fossils are uncovered during excavation.</p> <p>LEGISLATION</p> <p>Cultural Heritage in South Africa (includes all heritage resources) is protected by the National Heritage Resources Act (Act No 25 of 1999) (NHRA). According to Section 3 of the Act, all Heritage resources include “all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens”.</p> <p>Palaeontological heritage is unique and non-renewable and is protected by the NHRA and are the property of the State. It is thus the responsibility of the State to manage and conserve fossils on behalf of the citizens of South Africa. Palaeontological resources may not be excavated, broken, moved, or destroyed by any development without prior assessment and without a permit from the relevant heritage resources authority as per section 35 of the NHRA.</p> <p>A fossil is the naturally preserved remains (or traces thereof) of plants or animals embedded in rock. These organisms lived millions of years ago. Fossils are extremely rare and irreplaceable. By studying fossils, it is possible to determine environmental conditions that existed in a specific geographical area, millions of years ago.</p> <p>This informational document is intended for workmen and foremen on construction sites. It describes the actions to be taken when construction activities accidentally uncover fossil material.</p> <p>It is the responsibility of the Environmental Site Officer (ESO) or site manager of the project to train the workmen and foremen in the procedure to follow when a fossil is accidentally uncovered. In the absence of the ESO, a member of the staff must be appointed to be responsible for the proper implementation of the chance find protocol as not to compromise the conservation of fossil material.</p>		
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	<p>CHANCE FIND PROCEDURE</p> <ul style="list-style-type: none">• If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. <p>The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web:</p> <ul style="list-style-type: none">• www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.• A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.• Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.• Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.• The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.• If the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO. Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.• Once the Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.		
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<p>Heritage Impact Assessment</p>	<p>A total of nine sites were recorded during the survey which include one graveyard (Site 6) and six historical farmhouse complexes and other historical structures (Sites 1, 3, 4, 5, 7 and 8) and two large rock art sites (Sites 2 and 9). The historical farmhouses and other associated structures mostly date to the late 1800s to early 1900s and are associated with early farming activities. However, some of the headstones in the graveyard date to early 1800s which indicate a possible earlier occupation window in area. Early maps confirm that by the late 19th century the farms were already well established. Please note that the Doctor's Kraal complex is associated with a veterinary service that was provided probably from the 1890s. Although most sites correlate or overlap, note that the survey conducted by Van Ryneveld (2013a) recorded a total of 27 sites. This adds to the high density of the distribution of heritage sites on the farm.</p> <p>In this regard please note the following proposed mitigation measures:</p> <ul style="list-style-type: none"> ▣ Take note of the position of the existing heritage sites; ▣ A buffer zone of 50 metres should be maintained; ▣ The graveyard should be fenced off with a gate installed; and ▣ Care should be taken to prevent any indirect impacts on the historical structures. <p>It is therefore recommended, from a cultural heritage perspective that the proposed prospecting initiatives may proceed, dependent on adherence to the proposed mitigation measures.</p>		<p>Appendix 12</p>

Survey: A graveyard (Site 6), six historical farmhouse complexes and other historical structures (Sites 1, 3, 4, 5, 7 and 8) and two large rock art sites (Sites 2 and 9)		
	Without mitigation	With mitigation
Prospecting Phase		
<i>Probability</i>	Definite (5)	Very Improbable (1)
<i>Duration</i>	Permanent (5)	Short term (2)
<i>Extent</i>	Limited to the site (1)	Limited to the site (1)
<i>Magnitude</i>	Very High (10)	Minor (2)
Significance of Impact	80 (High)	5 (Low)
<i>Status (positive or negative)</i>	Negative	Positive
Reversibility	Low	Low
<i>Irreplaceable loss of resources?</i>	Yes	None
<i>Cumulative impacts and indirect impacts</i>	Prospecting phase may cause excessive vibrations.	
<i>Can impacts be mitigated?</i>	Yes, buffer zones (50 metres) should be maintained during prospecting developments	
<p>No Iron Age settlements, structures, features, assemblages or artefacts were recorded during the survey.</p> <p>Also, please note:</p> <p>If the exhumation and reburial of the graveyards are envisaged it will entail social consultation and permit application. Other legislative measures which may be pertinent include the Removal of Graves and Dead Bodies Ordinance (Ordinance No. 7 of 1925), Regulations Relating to the Management of Human Remains (GNR 363 of 22 May 2013) made in terms of the National Health Act No. 61 of 2003, Ordinance on Exhumations (Ordinance No. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place. Note that unmarked graves are by default regarded as older than 60 years and therefore falls under the NHRA (Act No. 25 of 1999, Section 36).</p> <p>Archaeological deposits usually occur below ground level. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and a university or museum notified in order for an investigation and evaluation of the find(s) to take place (cf. NHRA (Act No. 25 of 1999), Section 36 (6)).</p>		

According to the DEA Screening Report, nine (9) specialist assessments have been identified for inclusion in the assessment report. Please see the table below for the list of these studies and also our response. Please refer to **Appendix 7**.

Specialist study according to DEA Screening tool	Response
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Agriculture Impact Assessment		<p>We do not see a need for this study.</p> <p>The land capability for the proposed area and surrounding area also falls withing Land in Class VII (7)</p> <p>The Prospecting Work Programme (PWP) states 200 boreholes will be drilled [impact: 2m (length) x 2m (breath)] and 50 pits [3m (length) x 2m (breath) x 4m (depth)] will be dug. This calculates to a disturbance of ± 0.11ha</p> <p>The whole application area is 2291.7235 ha thus the 0.11ha disturbance is very small compared to the size of the application area.</p> <p>Due to the low disturbance (±0.11 Ha over a 2291.7235 ha are) the impact is expected to be low The area will be concurrently rehabilitated. The prospecting activity will not disturb existing activities on the portions as both (existing activities and prospecting activities) can be done concurrently.</p>
Biodiversity study	Animal Species Assessment	A Terrestrial Biodiversity & Wetland Assessment has been conducted and included in Appendix 12 of this Report
	Aquatic Biodiversity Impact Assessment	
	Plant Species Assessment	
	Terrestrial Biodiversity Impact Assessment	
Archaeological and Cultural Heritage Impact Assessment		A Phase 1 Heritage Impact Assessment together with a Paleontological Desktop Assessment has been conducted and in Appendix 12 of this Report
Palaeontology Impact Assessment		
Noise Impact Assessment		We do not see the need for this study as noise is limited to working hours.
Radioactivity Impact Assessment		This study is not necessary since the process of mining Diamonds Alluvial, Diamonds General, Diamonds in Kimberlite and Diamonds does not have any radioactive effects.

L. ENVIRONMENTAL IMPACT STATEMENT

i) SUMMARY OF THE KEY FINDINGS

This section provides a summary of the assessment and conclusions drawn from the proposed prospecting area. In doing so, it draws on the information gathered as part of the environmental impact assessment process and the knowledge gained by the environmental consultant during the course of the process and presents an informed opinion on the environmental impacts associated with the proposed project. The following conclusions can be drawn for the proposed prospecting activity:

➤ Potential impacts on biodiversity:

According to the DEA Screening report the sensitivity of the proposed area is as follow:

- *Plant Species theme sensitivity:* Low throughout the study area
- *Aquatic Biodiversity sensitivity:* Very High on the proposed area where water bodies have been identified and low throughout most of the study area
- *Terrestrial Biodiversity sensitivity:* Very High on eastern part of the proposed area and low throughout the rest of the area
- *Animal Species sensitivity:* Medium throughout the area

It is expected that some vegetation might be lost but through implementing mitigation measures, no adverse impacts are expected. The application is for a prospecting right without bulk sampling.

The Prospecting Work Programme (PWP) states 200 boreholes will be drilled [impact: 2m (length) x 2m (breadth)] and 50 pits [3m (length) x 2m (breadth) x 4m (depth)] will be dug. This calculates to a disturbance of ± 0.11 ha

The whole application area is 2291.7235 ha thus the 0.11ha disturbance is very small compared to the size of the application area.

Due to the low disturbance (± 0.11 Ha over a 2291.7235 ha are) the impact is expected to be low The area will be concurrently rehabilitated. The prospecting activity will not disturb existing activities on the portions as both (existing activities and prospecting activities) can be done concurrently.

➤ Potential impact on Archaeological artifacts and Palaeontological resources:

According to the DEA Screening Report the Archaeological and Cultural Heritage Theme Sensitivity is low with some small areas classified as high and the Paleontology Theme Sensitivity of a certain area on the proposed area falls within high sensitivity but is mostly dominated by a medium sensitivity.

Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA)**. According to Section 3 of the Act, all Heritage resources include “**all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**”.

If such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately and work must stop.

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

➤ Potential impacts on land use:

According to **Figure 20 and Figure 21** the proposed area is mostly covered by Low shrubland, Grassland, Ticket/Dense Bush and some bare non vegetated areas. According to the Landcover Map, the area is mostly natural (Figure 20 or 21). The property also borders the Orange River on its Eastern boundaries.

The activity will be subject to concurrent rehabilitation. The prospecting activity will not disturb existing activities on the portions as both (existing activities and prospecting activities) can be done concurrently.

- Potential social impacts: The presence of prospecting workers poses a potential risk to family structures and social networks. While the presence of prospecting workers does not in itself constitute a social impact, the manner in which workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks.
- Potential negative impacts: (noise, dust, soil degradation, storm water, traffic, health and safety) associated with the operation of the facility are expected to be of low - high impact, of medium terms and site specific. These can be mitigated or negated through the implementation of practical and appropriate mitigation measures.
- Positive impacts: The prospecting of Diamond (Alluvial), Diamond (General), Diamonds & Diamonds (Kimberlite) without bulk sampling, may result in socio-economic benefit to the area.

All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the migratory measures as set out in the Environmental Management Programme (EMPr) attached in Part B.

- All prospecting activities must be conducted in a manner that minimises noise impact, litter, environmental degradation and health hazards i.e. injuries.
- The mine must be kept neat and tidy during waste handling to prevent unsightliness and accidents.

Expected outcomes include:

- Minimum impacts on the environment as a result of prospecting
- Compliance with legislative requirements.
- Mine is neat and tidy and well managed.

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)

This alternative asks the question, if there is not, from an environmental perspective, a more suitable location for the proposed activity. Due to the expected mineral resources, **Mr Petrus Van Der Walt Vermeulen** would like to potentially mine for Diamond (Alluvial), Diamond (General), Diamonds & Diamonds (Kimberlite) on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD. The property is also owned by the Deelfontein Trust, of Which Mr Vermeulen is a Trustee therefore there will be no other alternative (i.e. to facilitate the movement of machinery, equipment, infrastructure).

N. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION.

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

- The operational activities and relevant rehabilitation of disturbed areas should be monitored against the improved EMP and all other relevant environmental legislation.
- A copy of the EMP should be made available onsite at all times.
- Implementation of the proposed mitigation measures set out in the EMP.

O. DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE. (Which relate to the assessment and mitigation measures proposed)

The uncertainties in results are mostly related to the availability of information, time available to gather the relevant information as well as the sometimes-subjective nature of the assessment methodology. If the authority feels that specialists' studies need to be conducted, such will be corresponded to the applicant.

P. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

Reasons why the activity should be authorized or not.

The option of not approving the activities will result in a significant loss of possible valuable minerals being exploited and all economic benefits will be lost. Considering that most of the impacts are rated as low, it is the opinion of the Environmental Assessment Practitioner that the Authorization may be granted

Q. CONDITIONS THAT MUST BE INCLUDED IN THE AUTHORISATION

- The operational activities and relevant rehabilitation of disturbed areas should be monitored against the improved EMP and all other relevant environmental legislation.
- A copy of the EMP should be made available onsite at all times.
- Implementation of the proposed mitigation measures set out in the EMP.
- All specialist reports are binding

The EMP should be binding on all managers and contractors operating/utilizing the site.

Period for which the Environmental Authorisation is required.

For a minimum of 5 years.

R. UNDERTAKING

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

The undertaking required to meet the requirements of this section is provided at the end of the EMP and is applicable to both the Environmental Impact Assessment report and the Environmental Management Programme report.

I, **Christiaan Baron** (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;

Signature of the environmental assessment practitioner:

Milnex CC

Name of company:

06/10/2022

Date:

S. FINANCIAL PROVISION

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

XXXXXX

i) Explain how the aforesaid amount was derived.

The closure cost estimate provided above is aligned with the Financial Provision Regulations. The amount was calculated by Milnex CC.

Financial Guarantee

The financial guarantee for the rehabilitation for land disturbed by **Mr Petrus Van Der Walt Vermeulen**, will be submitted to the department on request

Rehabilitation Fund

Mr Petrus Van Der Walt Vermeulen will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

ii) Motivation for the deviation.

Not applicable

T. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

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:

- i. **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 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 following impacts may be regarded as community impacts:

- Increased noise levels
- Potential water and soil pollution impacts.
- Potential loss of fauna and flora.
- Increased vehicle activity.
- Increased dust levels.
- Increase in water consumption and possible depletion of groundwater resources.
- Potential visual impacts.

Indirect socio-economic benefits are expected to be associated with the creation of employment.

- ii. **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 prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6. and 2.12. herein).

According to the DEA Screening Report the proposed area falls within low Archaeological and Cultural Heritage Theme Sensitivity with a small area classified as high and certain areas fall within medium to high Paleontology Theme Sensitivity.

Cultural Heritage in South Africa (includes all heritage resources) is protected by the **National Heritage Resources Act (Act 25 of 1999) (NHRA)**. According to Section 3 of the Act, all Heritage resources include “**all objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens**”.

If such resources are found during the mining or development activities, they shall not be disturbed without a permit from the relevant heritage resource Authority, which means that before such sites are disturbed by development it is incumbent on the developer to ensure that a heritage impact assessment is done and the Provincial Heritage Resources Authority and SAHRA must be contacted immediately and work must stop.

If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies:

- NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;
- NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA;

If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the **Chance Find Protocol** must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.

Chance Find Procedure

- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates.

- A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.

Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.

- The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

U. 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).

From a local perspective, the prospecting of Diamond (Alluvial), Diamond (General), Diamonds (Kimberlite) & Diamonds (DIA) including associated infrastructure on Portion 3 of the Farm Deelfontein 237, Registration Division: Hopetown RD, is preferred because the geological formation supports the possibility that the minerals applied for could be found on the proposed area.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

A) DETAILS OF THE EAP

- i) **The EAP who prepared the report**
- ii) **Expertise of the EAP**

Name of Practitioner	Qualifications	Contact details
Christiaan Baron	Master's Degree in Environmental Management (refer to Appendix 1) Registered EAP (EAPASA) Reg No: 2020/2639	Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: christiaan@milnex-sa.co.za

Contact details of other	Qualifications	Contact details
Lizanne Esterhuizen	Honours Degree in Environmental Science (refer to Appendix 1)	Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: lizanne@milnex-sa.co.za
Andile Nxumalo	Honours Degree in Environmental Science (refer to Appendix 1)	Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: andile.grant@milnex-sa.co.za

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).

It is hereby confirmed that the requirements to describe the aspects of the activity that are required by the EMP is already included in Part A, section 1(h).

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)

Refer to Locality Map, attached as **Appendix 3**.

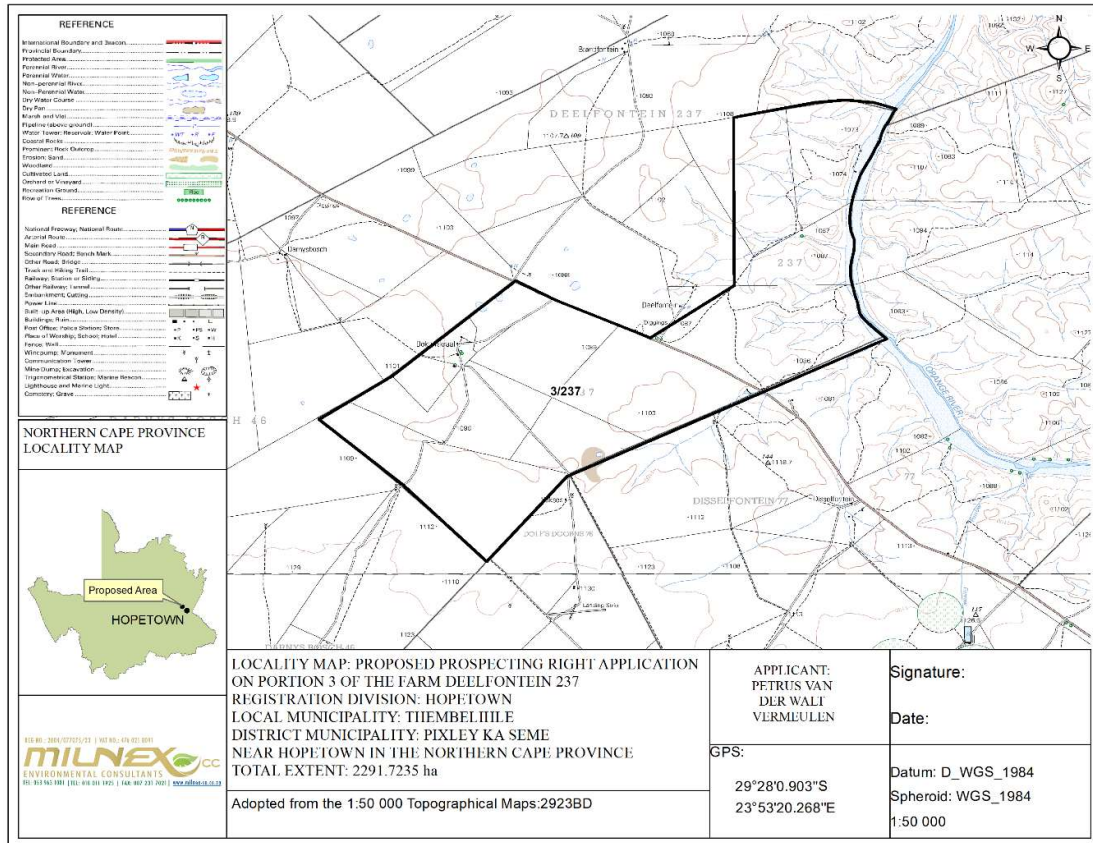


Figure 24: Locality Map

D) DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

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

Closure objectives for the Prospecting Right will aim to ensure that the residual post-closure impacts be minimized and be acceptable to relevant parties. To achieve these closure objectives, the following will be implemented:

- All prospecting related infrastructure, foundations and concrete areas will be decommissioned, removed from the site and appropriately disposed of. Reclaimable structures such as metal, electrical installations or equipment will be sold for re-use or as scrap.
- All disturbed areas within the site not already vegetated will be re-vegetated with appropriate indigenous, ecologically adapted species appropriate to the area and the final land use as soon as possible after operation ceases. Progress of vegetation growth/establishment, stability and drainage/erosion will be monitored and, in the event of adverse trends being identified, corrective measures will be implemented.
- Vegetation monitoring will consider, inter alia, the establishment of perennial ground cover and infestation by alien invasive plant species. The encroachment of indigenous vegetation into the area will be used as an indication of a stable, self-sustaining vegetation cover with little risk of retrogressing to a situation where are and water pollution may occur.

- Final landforms must be resilient to perturbation and also be self-sustaining to obviate/limit further/ongoing interventions and maintenance by **Mr Petrus Van Der Walt Vermeulen**. The remaining impacts be of an acceptable nature with minimal deterioration over time.
- The final outcome of the mine site rehabilitation would be productive systems, that will ensure the area will be returned to its natural state as far as possible.
- Environmental and human quality of life, including health and safety requirements in general, would not be compromised; and
- Closure is achieved in an efficient and cost-effective manner as possible and with minimum socioeconomic changes.

The above goal is underpinned by more specific objectives listed below.

1. **Upfront planning/development**

To provide overall guidance and direction to closure planning and/or the implementation of progressive closure measures over the remaining over the prospecting life.

2. **Physical stability**

To ensure that surface infrastructure and prospecting residue and/or disturbances that are present at processing plant decommissioning will be removed and/or stabilised in a manner that these will not compromise post-closure land use and be sustainable long-term landforms.

- Closure, removal and disposal of all surface infrastructure that has no beneficial post-closure use.
- Shaping and vegetating the remaining earth embankments, trenches, etc. to stabilise slopes and integrate with surrounding topography.

3. **Environmental quality**

To ensure that local environmental quality is not adversely affected by possible physical effects arising from prospecting operations and the prospecting site after closure. This will be achieved by:

- Avoiding and/or limiting the following during prospecting operations which could result in adverse effects that could not be readily addressed and/or mitigated at mine closure.
 - Dust fall-out areas surrounding the prospecting site.
 - Wash-off and/or mobilisation of chemically contaminated soils and sediments from the prospecting site that could have long term adverse effects on local aquatic health and/or other water uses.
 - Possible shallow groundwater contamination adversely affecting the quality of the local water resource and its beneficial use.
- Limiting the potential for dust generation on the rehabilitated prospecting site that could cause nuisance and/or health effects to surrounding landowners;
- Limiting the possible adverse water quality and quantity effects arising from the rehabilitated prospecting site to ensure that long term beneficial use of local resources is not compromised;
- Conducting soil clean-up/remediation to ensure that the planned land use could be implemented and maintained;

4. **Health and safety**

To limit the possible health and safety treats due to terrain hazards to humans and animals utilizing the rehabilitated prospecting site after closure by:

- Demonstrating through upfront soil testing that any resultant inorganic and organic pollution present on the site is acceptable;
- Removal of potential contaminants such as hydrocarbons and chemicals off site;
- Shaping of embankments and trenches to safe slopes and reintegrating of these into surrounding topography.
- Ensuring that the environmental quality as reflected above is achieved.

5. **Land capability / land use**

To ensure that the required land capability to achieve and support the planned land use can be achieved over the prospecting site by:

- Clean-up and reclamation of contaminated soil areas in order not to compromise the above land use planning earmarked for implementation;
- To ensure that the overall rehabilitated prospecting site is free draining

- Transferring prospecting related surface infrastructure to third parties for beneficial use after closure.

6. Aesthetic quality

To ensure that the rehabilitated prospecting site will display, at a minimum, an acceptable aesthetic appearance that would not compromise the planned land use by leaving behind:

- A prospecting area that is properly cleared-up with no fugitive/scattered waste piles
- Rehabilitated prospecting area that is free draining and disturbed areas that are suitably vegetated.
- Rehabilitated prospecting residues that are suitably landscaped, blending with the surrounding environment as far as possible.
- Shaped and rehabilitated terrace and hard stand areas, roughly emulating the local natural surface topography.

7. Landscape viability

To create a landscape that is self-sustaining and over time will evolve/converge to the desired ecosystem structure, function and composition by:

- Conducting surface profiling, with associated material movement optimisation, to obtain a landscape resembling the natural landscapes to support the succession trajectory towards a climax ecological system.
- Establishing woody patches and create “rough and loose” areas for pioneer specie establishment around the respective patches.
- Establishing pioneer species as follows:
 - Collected and prepared seeds for broad casting;
 - Seedlings grown on on-site nursery;
 - Cuttings collected from surrounding veld areas;
 - Conducting rehabilitation monitoring and corrective action as required.

8. Biodiversity

To encourage, where appropriate, the re-establishment of native vegetation on the rehabilitated mine site such the terrestrial biodiversity is largely re-instated over time, by:

- Stabilising disturbed areas to prevent erosion in the short- to medium term until a suitable vegetation cover has established; and
- Establishing viable self-sustaining vegetation communities of local fauna, as far as possible.

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 & Closure Plan is attached as **Appendix 10**.

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

XXXXX

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

Financial Guarantee

The financial guarantee for the rehabilitation for land disturbed by **Mr Petrus van Der Walt Vermeulen** will be submitted

Rehabilitation Fund

Mr Petrus van Der Walt Vermeulen will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

E) IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

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

ACTIVITIES (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	PHASE (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	SIZE AND SCALE of disturbance (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (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)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-. Upon cessation of the individual activity Or. Upon the cessation of mining, bulk sampling or prospecting as the case may be.
Clearance of vegetation	Pitting & drilling phase - (construction and operation phase)	2291.7235ha - 200 boreholes and 50 pits: 3m (length) x 2m (breadth) x 4m (depth). Concurrent backfilling will take place in order to rehabilitate.	<ol style="list-style-type: none"> 1. Site clearing must take place in a phased manner, as and when required. 2. Areas which are not to be prospected within two months must not be cleared to reduce erosion risks. 3. The area to be cleared must be clearly demarcated and this footprint strictly maintained. 4. Spoil that is removed from the site must be removed to an approved spoil site or a licensed landfill site. 5. The necessary silt fences and erosion control measures must be implemented in areas where these risks are more prevalent. 	Compliance with Duty of Care as detailed within NEMA	

Construction of roads (if any)	Pitting & drilling phase - (construction and operation phase)		<ol style="list-style-type: none"> 1. Planning of access routes to the site for construction/prospecting purposes shall be done in conjunction with the Contractor and the Landowner. All agreements reached should be documented and no verbal agreements should be made. The Contractor shall clearly mark all access roads. Roads not to be used shall be marked with a "NO ENTRY for prospecting vehicles" sign. 2. Construction routes and required access roads must be clearly defined. 3. Damping down of the un-surfaced roads must be implemented to reduce dust and nuisance. 4. Soils compacted by construction/prospecting activities shall be deep ripped to loosen compacted layers and re-graded to even running levels. 5. The contractor must ensure that damage caused by related traffic from a gravel road is repaired continuously. The costs associated with the repair must be borne by the contractor; 6. Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport the gravel are fitted with tarpaulins or covers; 7. All vehicles must be road-worthy and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits. 	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the prospecting activities.
Prospecting without bulk sampling for Diamond (Alluvial), Diamond (General), Diamonds & Diamonds (Kimberlite) – Soils and geology	Pitting & drilling phase - (construction and operation phase)	2291.7235ha - 200 boreholes and 50 pits: 3m (length) x 2m (breadth) x 4m (depth).	<ol style="list-style-type: none"> 1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil (If topsoil exists), and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected 	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the mine

		Concurrent backfilling will take place in order to rehabilitate.	<p>by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas.</p> <ol style="list-style-type: none"> 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area. 4. Subsoil and overburden in the prospecting area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms, trenches or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. 8. The impact on the geology will be permanent. There is no mitigation measure. 		
Prospecting without bulk sampling for Diamond (Alluvial), Diamond (General), Diamonds & Diamonds (Kimberlite)	Pitting & drilling phase - (construction and operation phase)	2291.7235ha - 200 boreholes and 50 pits: 3m (length) x 2m (breadth) x 4m (depth).	<ol style="list-style-type: none"> 1. The prospecting activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development. 	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the prospecting area

		<p>Concurrent backfilling will take place in order to rehabilitate.</p>	<ol style="list-style-type: none"> 2. Mine, pans, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants. 12. Applying regular and thorough maintenance schedules to equipment and processes. An 		
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			increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.		
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IMPACT MANAGEMENT OUTCOMES

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

ACTIVITY (whether listed or not listed). (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation.. 	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
Changing the physical structure within a water resource (habitat)	<u>Construction:</u> <ul style="list-style-type: none"> • Infrastructure development within watercourses • Loss of vegetation • Erosion <u>Operational:</u> <ul style="list-style-type: none"> • Excavation from the watercourses leading to degraded river channels. • Removal of substrate within wetlands • Clearing of vegetation – vegetation loss 	Fauna & flora	(construction and operation phase)	<ul style="list-style-type: none"> • Other than approved and authorised structures, no other development or maintenance infrastructure is allowed within the delineated watercourse and riparian areas or their associated buffer zones. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. • Monitor the occurrence of erosion during the rainy season and take immediate corrective action where needed. • No stockpiling should take place within a watercourse or the calculated buffers. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. 	Minimisation of impacts to acceptable limits

	<ul style="list-style-type: none"> • Loss of biodiversity • Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures <p>Vehicles driving in and through watercourses</p>			<ul style="list-style-type: none"> • No maintenance within watercourses must be conducted. • Maintenance activities should not impact on rehabilitated or naturally vegetated areas. • The duration of impacts on the wetland systems should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. • Rehabilitation must ensure that wetland structure and function are reinstated in such a way as to ensure the ongoing functionality of the systems at pre-prospecting levels. <p>All rehabilitation activities should occur in the dry season.</p>	
<p>Alteration of the amount of sediment entering the water resource and associated change in turbidity</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Vegetation clearance causing sedimentation • Earthworks activities • Disturbance of soil surface and runoff characteristics • Erosion <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Excavation from the watercourses leading to degraded river channels. • Removal of substrate within wetlands • Clearing of vegetation – vegetation loss • Loss of biodiversity • Vehicles driving in and through watercourses 			<ul style="list-style-type: none"> • Buffer zones should be maintained, in order to minimise sedimentation of the downstream areas. • No stockpiling should take place within a watercourse or the calculated buffers. • Ensure that erosion management and sediment controls are strictly implemented from the beginning of site clearing activities. • All areas should be re-sloped and top-soiled where necessary and reseeded with indigenous grasses to stabilise the loose material. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed stream banks. • As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. 	

	<p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures <p>Vehicles driving in and through watercourses</p>			<ul style="list-style-type: none"> • Erosion control measures, such as berms, must be implemented to manage runoff from roads to prevent erosion and pollution. • Rehabilitation of disturbed areas as a result of construction must be implemented immediately upon completion of construction. • Rehabilitation must ensure that riparian structure and function are reinstated in such a way as to ensure the ongoing functionality of the larger riparian systems at pre-prospecting levels. • All rehabilitation activities should occur in the dry season. • The duration of impacts on the riverine systems should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. • Maintain flood capacity, particularly in areas with significant flood hazards. 	
<p>Alteration of water quality (surface and groundwater) and soil pollution</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Runoff from road surfaces • Discharge of solvents, chemicals and hydrocarbons <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Maintenance of vehicles and machinery • Runoff from road surfaces • Discharge of sewage • Discharge of solvents, chemicals and hydrocarbons 			<ul style="list-style-type: none"> • Re-fuelling must take place on a sealed surface area to prevent hydrocarbon pollution. • All spills should be cleaned up immediately and disposed of. • Spill kits should be readily available and easily accessible throughout the site. • All chemicals must be stored safely on site, outside the buffer areas and surrounded by bunds. Chemical storage containers must be regularly inspected for early leak detection. • Littering must be prevented by effective site management and the provision of bins. • Provision of adequate sanitation facilities located outside of the delineated buffer zones. • An emergency spill procedure should be developed and implemented. 	

	<ul style="list-style-type: none"> Excavation from the watercourses and the release of nutrients and pollutants from disturbed soils Removal of substrate within wetlands <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> Damage to vegetated areas Ineffective rehabilitation measures <p>Vehicles driving in and through watercourses</p>			<ul style="list-style-type: none"> No stockpiling should take place within a watercourse. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. Stockpiles must be located away from channels, wetlands and drainage lines. Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed riverbanks. 	
Loss of terrestrial habitat	<p><u>Construction:</u></p> <ul style="list-style-type: none"> Clearing of vegetation – vegetation loss <p><u>Operational:</u></p> <ul style="list-style-type: none"> Removal of substrate within watercourses Clearing of vegetation during prospecting operations <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> Damage to vegetated areas Ineffective rehabilitation measures 			<ul style="list-style-type: none"> Areas that are stripped during construction and operation should be re-vegetated with indigenous vegetation. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined project area) and preventing movement of workers into natural areas. The duration of the prospecting should be minimised to as short term as possible, in order to reduce the period of disturbance on fauna and flora. Areas of indigenous vegetation should under no circumstances be fragmented or disturbed or used as an area for dumping of waste. As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. 	

				<ul style="list-style-type: none"> • All staff and visitors to the site must undergo an induction process and must be made aware of the sensitive nature of the environment and floral species which occur there. • The area must be re-vegetated with plant and grass species which are indigenous to the exact vegetation types. • Rehabilitation measures that are implemented must be continually monitored to ensure that proper succession has occurred and that there is no erosion occurring. • An alien invasive vegetation management plan should be developed and implemented. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. 	
Loss of Aquatic Biota	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Runoff from road surfaces • Sedimentation • Discharge of solvents, chemicals and hydrocarbons <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Maintenance of vehicles and machinery • Runoff from road surfaces • Discharge of solvents, chemicals and hydrocarbons • Excavation from the watercourses and the 			<ul style="list-style-type: none"> • Biomonitoring of aquatic organisms within the wetland systems is essential. 	

	<p>release of nutrients and pollutants from disturbed soils</p> <ul style="list-style-type: none"> Removal of substrate within wetlands <p>Sedimentation</p>				
Loss of Terrestrial Fauna	<p>Construction and Operational:</p> <ul style="list-style-type: none"> Vegetation loss and disturbance – clearing of vegetation Excessive noise disturbances Illegal hunting Habitat fragmentation destruction Vehicles driving through natural vegetated areas 			<ul style="list-style-type: none"> Site clearing to take place in a phased manner (where possible) to allow for any faunal species present to move away from the study site to the surrounding open space areas. Prior and during vegetation clearance any larger fauna species noted should be given the opportunity to move away from the construction machinery. Fauna species such as frogs and reptiles that have not moved away should be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO trained in the handling and relocation of animals. Fencing should be erected around the project area to prevent workers and members of the public from entering the surrounding environments. This fence should have small openings to allow wildlife to pass through. Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. Should any sensitive or Red Data animal or bird species be encountered during the construction, operation and decommissioning activities, these should be relocated to natural areas in the vicinity. Any sensitive fauna that are inadvertently killed 	

				<p>during earthmoving operations should be preserved as museum voucher specimens.</p> <ul style="list-style-type: none"> • No hunting, trapping or killing of fauna are allowed. • Any lizards, snakes or monitors encountered should be allowed to escape to a suitable habitat away from disturbance. • General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area. • Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench. 	
Loss of Terrestrial Flora	<p><u>Construction and Operational:</u></p> <ul style="list-style-type: none"> • Vegetation clearance • Vehicles driving through natural vegetated areas <p>Habitat fragmentation and destruction</p>			<ul style="list-style-type: none"> • Areas that are stripped during construction and operation should be re-vegetated with indigenous vegetation as soon as possible. This will also reduce the likelihood of encroachment by alien invasive plant species. • Protected trees and plants shall not be removed or damaged without prior approval, permits or licenses from the relevant authority. 	
Introduction and spread of alien vegetation	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Clearing of vegetation <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Removal of substrate within watercourses • Clearing of vegetation during prospecting operations • Vehicles driving in and through watercourses 			<ul style="list-style-type: none"> • Proliferation of alien and invasive species is expected within any disturbed areas particularly as there are some alien and invasive species present within the study site. These species should be eradicated and controlled to prevent further spread beyond. • An alien invasive vegetation management plan should be developed and implemented. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. 	

	<p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures <p>Vehicles driving in and through watercourses</p>			<ul style="list-style-type: none"> • Footprint areas should be kept as small as possible when removing alien plant species. • No vehicles should be allowed to drive through designated sensitive drainage and wetlands areas during the eradication of alien and weed species. • Monitoring and eradication of invasive plant species should be continued five years after decommissioning. 	
Prospecting without bulk sampling for Diamond (Alluvial), Diamond (General), Diamonds & Diamonds (Kimberlite)	Loss of topsoil	Soil	(construction and operation phase)	<ol style="list-style-type: none"> 1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area. 4. Subsoil and overburden in the prospecting area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved 	Minimisation of impacts to acceptable limits

				<p>waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager.</p> <p>Establish an effective record keeping system for each area where soil is disturbed for prospecting purposes. These records should be included in environmental performance reports, and should include all the records below.</p> <ul style="list-style-type: none"> • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation prospecting activities at the particular site. • Photograph the area on cessation of prospecting activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time. 	
	Erosion	Soil Air Water	(construction and operation phase)	<ol style="list-style-type: none"> 1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream. 3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 	Minimisation of impacts to acceptable limits

				<ol style="list-style-type: none"> 4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly 5. Wind screening and stormwater control should be undertaken to prevent soil loss from the site. 6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. 7. Other erosion control measures that can be implemented are as follows: <ul style="list-style-type: none"> o Brush packing with cleared vegetation o Mulch or chip packing o Planting of vegetation o Hydroseeding/hand sowing 8. Sensitive areas need to be identified prior to construction/prospecting so that the necessary precautions can be implemented. 9. All erosion control mechanisms need to be regularly maintained. 10. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces. 11. Retention of vegetation where possible to avoid soil erosion. 12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time. 13. Re-vegetation of disturbed surfaces should occur immediately after construction/prospecting activities are completed. This should be done through seeding with indigenous grasses. 14. No impediment to the natural water flow other than approved erosion control works is permitted. 15. To prevent stormwater damage, the increase in stormwater run-off resulting from 	
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				<p>construction/prospecting activities must be estimated and the drainage system assessed accordingly.</p> <p>16. Stockpiles not used in three (3) months after stripping must be seeded or backfilled to prevent dust and erosion.</p>	
	Air Pollution	Air	(construction and operation phase)	<p>Dust control</p> <ol style="list-style-type: none"> 1. Wheel washing and damping down of un-surfaced and un-vegetated areas. 2. Retention of vegetation where possible will reduce dust travel. 3. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas. 4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust. 5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities. 6. A speed limit of 30km/h must not be exceeded on site. 7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor. 8. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled. <p>Odour control</p> <ol style="list-style-type: none"> 9. Regular servicing of vehicles in order to limit gaseous emissions. 10. Regular servicing of onsite toilets to avoid potential odours. <p>Rehabilitation</p>	Minimisation of impacts to acceptable limits

				<p>11. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks.</p> <p>Fire prevention</p> <p>12. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.</p> <p>13. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.</p>	
	Noise		(construction and operation phase)	<p>1. The prospecting activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development.</p> <p>2. Workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system.</p> <p>3. Truck traffic should be routed away from noise sensitive areas, where possible.</p> <p>4. Noise levels must be kept within acceptable limits.</p> <p>5. Noisy operations should be combined so that they occur where possible at the same time.</p> <p>6. Mine workers to wear necessary ear protection gear.</p> <p>7. Noisy activities to take place during allocated hours.</p> <p>8. Noise from labourers must be controlled.</p> <p>9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order,</p>	Minimisation of impacts to acceptable limits

				<p>the Contractor may be instructed to remove the offending vehicle or machinery from the site.</p> <p>10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport.</p> <p>11. Implementation of enclosure and cladding of processing plants.</p> <p>12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine.</p>	
	Impact on potential cultural, heritage artefacts and fossils.	Heritage and Palaeontology	(construction and operation phase)	<ul style="list-style-type: none"> ▣ Take note of the position of the existing heritage sites; ▣ A buffer zone of 50 metres should be maintained; ▣ The graveyard should be fenced off with a gate installed; and ▣ Care should be taken to prevent any indirect impacts on the historical structures. <ol style="list-style-type: none"> 1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA. 2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. 3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken. 	Minimisation of impacts to acceptable limits

				<ol style="list-style-type: none"> 4. Known sites should be clearly marked in order that they can be avoided. The work force should also be informed that fenced-off areas are no-go areas. 5. The ECO must also survey for heritage and palaeontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development. 6. All digging, excavating, drilling or blasting activities must be stopped if heritage and/or palaeontological artefacts are uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures. 7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any heritage/palaeontology sites are to be destroyed or altered. 8. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1). 9. If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies: <ul style="list-style-type: none"> • NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone 	
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				<p>artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (021 462 5402) must be alerted as per section 35(3) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule;</p> <ul style="list-style-type: none"> • NHRA 38(4)c(ii) – If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (012 320 8490), must be alerted immediately as per section 36(6) of the NHRA. Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule; • NHRA 38(4)e – The following conditions apply with regards to the appointment of specialists: i) If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; <p>If fossil remains or trace fossils are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented by the Environmental Control Officer (ECO) in charge of these developments. These discoveries ought to be protected and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel:</p>	
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				<p>021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation can be carry out by a paleontologist.</p> <p>Chance Find Procedure</p> <ul style="list-style-type: none"> • If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates. • Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found. 	
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				<p>Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.</p> <ul style="list-style-type: none"> • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area. 	
Waste management		Pollution	(construction and operation phase)	<p>Litter management</p> <ol style="list-style-type: none"> 1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site. 2. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill. 3. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction site. 4. If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal 	Minimisation of impacts to acceptable limits

				<p>and wood and recycled. An independent contractor can be appointed to conduct this recycling.</p> <ol style="list-style-type: none"> 5. Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite. 6. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. 7. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. 8. Where a registered waste site is not available close to the construction site, the Contractor shall provide a method statement with regard to waste management. 9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. 10. Under no circumstances may solid waste be burnt on site. 11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. <p>Hazardous waste</p> <ol style="list-style-type: none"> 12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant. 13. Contaminants to be stored safely to avoid spillage. 14. Machinery must be properly maintained to keep oil leaks in check. 15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction and any spills shall immediately be cleaned up and all affected areas rehabilitated. 	
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				<p>Sanitation</p> <ol style="list-style-type: none"> 16. The Contractor shall install mobile chemical toilets on the site. 17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed. 18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly. 19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer. 20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility. 21. The construction of “Long Drop” toilets is forbidden, but rather toilets connected to the sewage treatment plant. 22. Potable water must be provided for all construction staff. <p>Remedial actions</p> <ol style="list-style-type: none"> 23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site. 24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site. 25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil. 	
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				<p>26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.</p> <p>27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.</p> <p>28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.</p> <p>29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.</p>	
Water Use and Quality	Water pollution	Water	(construction and operation phase)	<p>Water Use</p> <p>1. Develop a sustainable water supply management plan to minimise the impact to natural systems by managing water use, avoiding depletion of aquifers and minimising impacts to water users.</p> <p>2. Water must be reused, recycled or treated where possible.</p> <p>Water Quality</p> <p>3. The quality and quantity of effluent streams discharged to the environment including stormwater should be managed and treated to meet applicable effluent discharge guidelines.</p> <p>4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone.</p> <p>5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities, workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans.</p>	

				<p>Stormwater</p> <ol style="list-style-type: none"> 6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants. 7. Silt fences should be used to prevent any soil entering the stormwater drains. 8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration. 9. Promote a water saving mind set with construction/ prospecting workers in order to Contractor ensure less water wastage. 10. Hazardous substances must be stored at least 40m from any water bodies on site to avoid pollution. 11. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase. 12. Earth, stone and rubble is to be properly disposed of, or utilized on site so as not to obstruct natural water path ways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers. 13. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed. 14. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. <p>Groundwater resource protection</p>	
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				<p>15. Process solution storage ponds and other impoundments designed to hold non fresh water or non-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality.</p> <p>Sanitation</p> <p>16. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers).</p> <p>17. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.</p> <p>Concrete mixing</p> <p>18. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth.</p> <p>Public areas</p> <p>19. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis.</p> <p>20. The Contractor should take steps to ensure that littering by construction/ prospecting workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines.</p> <p>21. No washing or servicing of vehicles on site.</p>	
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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).

ACTIVITY Whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation..	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or prospecting as the case may be.	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Changing the physical structure within a water resource (habitat)	<p>Construction:</p> <ul style="list-style-type: none"> Infrastructure development within watercourses Loss of vegetation Erosion <p>Operational:</p> <ul style="list-style-type: none"> Excavation from the watercourses leading to degraded river channels. Removal of substrate within wetlands 	<ul style="list-style-type: none"> Other than approved and authorised structures, no other development or maintenance infrastructure is allowed within the delineated watercourse and riparian areas or their associated buffer zones. Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. Monitor the occurrence of erosion during the rainy season and take immediate corrective action where needed. No stockpiling should take place within a watercourse or the calculated buffers. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. No maintenance within watercourses must be conducted. 	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

	<ul style="list-style-type: none"> • Clearing of vegetation – vegetation loss • Loss of biodiversity • Vehicles driving in and through watercourses <p>Decommissioning:</p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures <p>Vehicles driving in and through watercourses</p>	<ul style="list-style-type: none"> • Maintenance activities should not impact on rehabilitated or naturally vegetated areas. • The duration of impacts on the wetland systems should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. • Rehabilitation must ensure that wetland structure and function are reinstated in such a way as to ensure the ongoing functionality of the systems at pre-prospecting levels. <p>All rehabilitation activities should occur in the dry season.</p>		
<p>Alteration of the amount of sediment entering the water resource and associated change in turbidity</p>	<p>Construction:</p> <ul style="list-style-type: none"> • Vegetation clearance causing sedimentation • Earthworks activities • Disturbance of soil surface and runoff characteristics • Erosion <p>Operational:</p> <ul style="list-style-type: none"> • Excavation from the watercourses leading to degraded river channels. • Removal of substrate within wetlands 	<ul style="list-style-type: none"> • Buffer zones should be maintained, in order to minimise sedimentation of the downstream areas. • No stockpiling should take place within a watercourse or the calculated buffers. • Ensure that erosion management and sediment controls are strictly implemented from the beginning of site clearing activities. • All areas should be re-sloped and top-soiled where necessary and reseeded with indigenous grasses to stabilise the loose material. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed stream banks. • As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. 	<p>Duration of operation</p>	<p>The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.</p>

	<ul style="list-style-type: none"> • Clearing of vegetation – vegetation loss • Loss of biodiversity • Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures <p>Vehicles driving in and through watercourses</p>	<ul style="list-style-type: none"> • Erosion control measures, such as berms, must be implemented to manage runoff from roads to prevent erosion and pollution. • Rehabilitation of disturbed areas as a result of construction must be implemented immediately upon completion of construction. • Rehabilitation must ensure that riparian structure and function are reinstated in such a way as to ensure the ongoing functionality of the larger riparian systems at pre-prospecting levels. • All rehabilitation activities should occur in the dry season. • The duration of impacts on the riverine systems should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. <p>Maintain flood capacity, particularly in areas with significant flood hazards.</p>		
<p>Alteration of water quality (surface and groundwater) and soil pollution</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Runoff from road surfaces • Discharge of solvents, chemicals and hydrocarbons <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Maintenance of vehicles and machinery • Runoff from road surfaces • Discharge of sewage • Discharge of solvents, chemicals and hydrocarbons 	<ul style="list-style-type: none"> • Re-fuelling must take place on a sealed surface area to prevent hydrocarbon pollution. • All spills should be cleaned up immediately and disposed of. • Spill kits should be readily available and easily accessible throughout the site. • All chemicals must be stored safely on site, outside the buffer areas and surrounded by bunds. Chemical storage containers must be regularly inspected for early leak detection. • Littering must be prevented by effective site management and the provision of bins. • Provision of adequate sanitation facilities located outside of the delineated buffer zones. • An emergency spill procedure should be developed and implemented. • No stockpiling should take place within a watercourse. 	<p>Duration of operation</p>	<p>The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.</p>

	<ul style="list-style-type: none"> Excavation from the watercourses and the release of nutrients and pollutants from disturbed soils Removal of substrate within wetlands <p>Decommissioning:</p> <ul style="list-style-type: none"> Damage to vegetated areas Ineffective rehabilitation measures <p>Vehicles driving in and through watercourses</p>	<ul style="list-style-type: none"> All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. Stockpiles must be located away from channels, wetlands and drainage lines. <p>Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed riverbanks.</p>		
Loss of terrestrial habitat	<p>Construction:</p> <ul style="list-style-type: none"> Clearing of vegetation – vegetation loss <p>Operational:</p> <ul style="list-style-type: none"> Removal of substrate within watercourses Clearing of vegetation during prospecting operations <p>Decommissioning:</p> <ul style="list-style-type: none"> Damage to vegetated areas 	<ul style="list-style-type: none"> Areas that are stripped during construction and operation should be re-vegetated with indigenous vegetation. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined project area) and preventing movement of workers into natural areas. The duration of the prospecting should be minimised to as short term as possible, in order to reduce the period of disturbance on fauna and flora. Areas of indigenous vegetation should under no circumstances be fragmented or disturbed or used as an area for dumping of waste. As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. 	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

	<ul style="list-style-type: none"> Ineffective rehabilitation measures 	<ul style="list-style-type: none"> All staff and visitors to the site must undergo an induction process and must be made aware of the sensitive nature of the environment and floral species which occur there. The area must be re-vegetated with plant and grass species which are indigenous to the exact vegetation types. Rehabilitation measures that are implemented must be continually monitored to ensure that proper succession has occurred and that there is no erosion occurring. An alien invasive vegetation management plan should be developed and implemented. <p>Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat.</p>		
Loss of Aquatic Biota	<p>Construction:</p> <ul style="list-style-type: none"> Runoff from road surfaces Sedimentation Discharge of solvents, chemicals and hydrocarbons <p>Operational:</p> <ul style="list-style-type: none"> Maintenance of vehicles and machinery Runoff from road surfaces Discharge of solvents, chemicals and hydrocarbons Excavation from the watercourses and the release of nutrients and pollutants from disturbed soils 	<ul style="list-style-type: none"> Biomonitoring of aquatic organisms within the wetland systems is essential. 	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

	<ul style="list-style-type: none"> Removal of substrate within wetlands <p>Sedimentation</p>			
Loss of Terrestrial Fauna	<p>Construction and Operational:</p> <ul style="list-style-type: none"> Vegetation loss and disturbance – clearing of vegetation Excessive noise disturbances Illegal hunting Habitat fragmentation destruction Vehicles driving through natural vegetated areas 	<ul style="list-style-type: none"> Site clearing to take place in a phased manner (where possible) to allow for any faunal species present to move away from the study site to the surrounding open space areas. Prior and during vegetation clearance any larger fauna species noted should be given the opportunity to move away from the construction machinery. Fauna species such as frogs and reptiles that have not moved away should be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO trained in the handling and relocation of animals. Fencing should be erected around the project area to prevent workers and members of the public from entering the surrounding environments. This fence should have small openings to allow wildlife to pass through. Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. Should any sensitive or Red Data animal or bird species be encountered during the construction, operation and decommissioning activities, these should be relocated to natural areas in the vicinity. Any sensitive fauna that are inadvertently killed during earthmoving operations should be preserved as museum voucher specimens. No hunting, trapping or killing of fauna are allowed. Any lizards, snakes or monitors encountered should be allowed to escape to a suitable habitat away from disturbance. 	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		<ul style="list-style-type: none"> General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area. <p>Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.</p>		
Loss of Terrestrial Flora	<p><u>Construction and Operational:</u></p> <ul style="list-style-type: none"> Vegetation clearance Vehicles driving through natural vegetated areas <p>Habitat fragmentation and destruction</p>	<ul style="list-style-type: none"> Areas that are stripped during construction and operation should be re-vegetated with indigenous vegetation as soon as possible. This will also reduce the likelihood of encroachment by alien invasive plant species. <p>Protected trees and plants shall not be removed or damaged without prior approval, permits or licenses from the relevant authority.</p>	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.
Introduction and spread of alien vegetation	<p><u>Construction:</u></p> <ul style="list-style-type: none"> Clearing of vegetation <p><u>Operational:</u></p> <ul style="list-style-type: none"> Removal of substrate within watercourses Clearing of vegetation during prospecting operations Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> Damage to vegetated areas 	<ul style="list-style-type: none"> Proliferation of alien and invasive species is expected within any disturbed areas particularly as there are some alien and invasive species present within the study site. These species should be eradicated and controlled to prevent further spread beyond. An alien invasive vegetation management plan should be developed and implemented. Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. Footprint areas should be kept as small as possible when removing alien plant species. No vehicles should be allowed to drive through designated sensitive drainage and wetlands areas during the eradication of alien and weed species. <p>Monitoring and eradication of invasive plant species should be continued five years after decommissioning.</p>	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

	<ul style="list-style-type: none"> Ineffective rehabilitation measures <p>Vehicles driving in and through watercourses</p>			
Prospecting without bulk sampling for Diamond (Alluvial), Diamond (General), Diamonds & Diamonds (Kimberlite).	Loss of topsoil	<ol style="list-style-type: none"> The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction/prospecting and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. Care must be taken not to mix topsoil and subsoil or any other material, during stripping. The topsoil must be conserved on site in and around the pit/trench area. Subsoil and overburden in the prospecting area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. <p>Establish an effective record keeping system for each area where soil is disturbed for prospecting purposes. These records should be included in environmental performance reports, and should include all the records below.</p>	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		<ul style="list-style-type: none"> • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation prospecting activities at the particular site. • Photograph the area on cessation of prospecting activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time. 		
	Erosion	<ol style="list-style-type: none"> 1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream. 3. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 4. Monitor the area regularly after larger rainfall events to determine where erosion may be initiated and then mitigate by modifying the soil micro-topography and revegetation or soil erosion control efforts accordingly 5. Wind screening and stormwater control should be undertaken to prevent soil loss from the site. 6. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. 7. Other erosion control measures that can be implemented are as follows: <ul style="list-style-type: none"> ○ Brush packing with cleared vegetation ○ Mulch or chip packing ○ Planting of vegetation ○ Hydroseeding/hand sowing 	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		<ol style="list-style-type: none"> 8. Sensitive areas need to be identified prior to construction/prospecting so that the necessary precautions can be implemented. 9. All erosion control mechanisms need to be regularly maintained. 10. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces. 11. Retention of vegetation where possible to avoid soil erosion. 12. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time. 13. Re-vegetation of disturbed surfaces should occur immediately after construction/prospecting activities are completed. This should be done through seeding with indigenous grasses. 14. No impediment to the natural water flow other than approved erosion control works is permitted. 15. To prevent stormwater damage, the increase in stormwater run-off resulting from construction/prospecting activities must be estimated and the drainage system assessed accordingly. A drainage plan must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings. 16. Stockpiles not used in three (3) months after stripping must be seeded/backfilled to prevent dust and erosion. 		
	Air Pollution	<p>Dust control</p> <ol style="list-style-type: none"> 1. Wheel washing and damping down of un-surfaced and un-vegetated areas. 2. Retention of vegetation where possible will reduce dust travel. 3. Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas. 4. Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust. 5. The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities. 6. A speed limit of 30km/h must not be exceeded on site. 	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		<p>7. Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.</p> <p>8. Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled.</p> <p>Odour control</p> <p>9. Regular servicing of vehicles in order to limit gaseous emissions.</p> <p>10. Regular servicing of onsite toilets to avoid potential odours.</p> <p>Rehabilitation</p> <p>11. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks.</p> <p>Fire prevention</p> <p>12. No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.</p> <p>13. The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.</p>		
	Noise	<p>1. The prospecting activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development.</p> <p>2. Pans, power plants, crushers, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system.</p> <p>3. Truck traffic should be routed away from noise sensitive areas, where possible.</p> <p>4. Noise levels must be kept within acceptable limits.</p> <p>5. Noisy operations should be combined so that they occur where possible at the same time.</p>	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		<ol style="list-style-type: none"> 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants. 12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine. 		
	<p>Impact on potential cultural, heritage artefacts and fossils.</p>	<ul style="list-style-type: none"> ▣ Take note of the position of the existing heritage sites; ▣ A buffer zone of 50 metres should be maintained; ▣ The graveyard should be fenced off with a gate installed; and ▣ Care should be taken to prevent any indirect impacts on the historical structures. <ol style="list-style-type: none"> 1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA. 2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. 	<p>Duration of operation</p>	<p>The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.</p>

		<ol style="list-style-type: none"> 3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken. 4. Known sites should be clearly marked in order that they can be avoided. The workforce should also be informed that fenced-off areas are no-go areas. 5. The ECO must also survey for heritage and palaeontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development. 6. All digging, excavating, drilling or blasting activities must be stopped if heritage and/or palaeontological artefacts are uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures. 7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any heritage/palaeontology sites are to be destroyed or altered. 8. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1). 9. If anything of Archaeological and/or paleontological significance is found during the construction and operational phase of the mine the following applies: <ul style="list-style-type: none"> • NHRA 38(4)c(i) – If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of 		
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Waste Management		<p>Litter management</p> <ol style="list-style-type: none"> Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction/prospecting site. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill. Good housekeeping practices should be implemented to regularly maintain the litter and rubble situation on the construction prospecting site. If possible and feasible, all waste generated on site must be separated into glass, plastic, paper, metal and wood and recycled. An independent contractor can be appointed to conduct this recycling. Littering by the employees of the Contractor shall not be allowed under any circumstances. The ECO shall monitor the neatness of the work sites as well as the Contractor campsite. Skip waste containers should be maintained on site. These should be kept covered and arrangements made for them to be collected regularly. All waste must be removed from the site and transported to a landfill site promptly to ensure that it does not attract vermin or produce odours. Where a registered waste site is not available close to the construction/prospecting site, the Contractor shall provide a method statement with regard to waste management. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. Under no circumstances may solid waste be burnt on site. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. 	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		<p>Hazardous waste</p> <p>12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant.</p> <p>13. Contaminants to be stored safely to avoid spillage.</p> <p>14. Machinery must be properly maintained to keep oil leaks in check.</p> <p>15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction/prospecting and any spills shall immediately be cleaned up and all affected areas rehabilitated.</p> <p>Sanitation</p> <p>16. The Contractor shall install mobile chemical toilets on the site.</p> <p>17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed.</p> <p>18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly.</p> <p>19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer.</p> <p>20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility.</p> <p>21. The construction of “Long Drop” toilets is forbidden, but rather toilets connected to the sewage treatment plant.</p> <p>22. Potable water must be provided for all construction staff.</p> <p>Remedial actions</p> <p>23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.</p> <p>24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.</p>		
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		<p>25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil.</p> <p>26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.</p> <p>27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.</p> <p>28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.</p> <p>29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.</p>		
Water Use and Quality	Water pollution	<p>Water Use</p> <p>1. Develop a sustainable water supply management plan to minimise the impact to natural systems by managing water use, avoiding depletion of aquifers and minimising impacts to water users.</p> <p>2. Water must be reused, recycled or treated where possible.</p> <p>Water Quality</p> <p>3. The quality and quantity of effluent streams discharged to the environment including stormwater should be managed and treated to meet applicable effluent discharge guidelines.</p> <p>4. Discharge to surface water should not result in contaminant concentrations in excess of local ambient water quality criteria outside a scientifically established mixing zone.</p> <p>5. Efficient oil and grease traps or sumps should be installed and maintained at refueling facilities, workshops, fuel storage depots, and containment areas and spill kits should be available with emergency response plans.</p> <p>Stormwater</p>		

		<ol style="list-style-type: none"> 6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants. 7. Silt fences should be used to prevent any soil entering the stormwater drains. 8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration. 9. Promote a water saving mind set with construction/prospecting workers in order to Contractor ensure less water wastage. 10. New stormwater construction must be developed strictly according to specifications from engineers in order to ensure efficiency. 11. Hazardous substances must be stored at least 20m from any water bodies on site to avoid pollution. 12. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase. 13. Earth, stone and rubble is to be properly disposed of, or utilized on site so as not to obstruct natural water path ways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers. 14. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed. 15. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. <p>Groundwater resource protection</p> <ol style="list-style-type: none"> 16. Process solution storage ponds and other impoundments designed to hold non fresh water or un-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality. 		
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		<p>Sanitation</p> <p>17. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers).</p> <p>18. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.</p> <p>Concrete mixing</p> <p>19. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth.</p> <p>Public areas</p> <p>20. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis.</p> <p>21. The Contractor should take steps to ensure that littering by construction workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines.</p> <p>22. No washing or servicing of vehicles on site.</p>		
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Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

G) MONITORING OF IMPACT MANAGEMENT ACTIONS

H) MONITORING AND REPORTING FREQUENCY

I) RESPONSIBLE PERSONS

J) TIME PERIOD FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS

K) MECHANISM FOR MONITORING COMPLIANCE

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Clearance of vegetation	Loss or fragmentation of habitats	<ul style="list-style-type: none"> Conduct regular internal audits Conduct regular external audits 	<ul style="list-style-type: none"> Environmental Manager Suitable qualified environmental auditor 	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Prospecting without bulk sampling of the applied for minerals	Loss of topsoil Erosion Air Pollution Noise Impact on potential cultural, heritage artefacts and fossils	<ul style="list-style-type: none"> Conduct regular internal audits Conduct regular external audits 	<ul style="list-style-type: none"> Environmental Manager Suitable qualified environmental auditor 	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Waste management	Pollution	<ul style="list-style-type: none"> Conduct regular internal audits Conduct regular external audits 	<ul style="list-style-type: none"> Environmental Manager Suitable qualified environmental auditor 	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External

				audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Water Use and Quality	Water pollution	<ul style="list-style-type: none"> • Conduct regular internal audits • Conduct regular external audits 	<ul style="list-style-type: none"> • Environmental Manager • Suitable qualified environmental auditor 	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.

L) INDICATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT REPORT.

External audits 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.**

Mr Petrus Van Der Walt Vermeulen will implement an Environmental Awareness Plan which will include various mechanisms for informing employees of environmental risks resulting from their work, including:

- Induction training for full –time staff and contractors;
- In-house training sessions to be held with relevant employees;
- On the job training regarding environmental issues
- Training and skills development

The above measures will be implemented through an Environmental Communication Strategy to be implemented.

See the attached **Appendix 11** for the Awareness plan

- i. **Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.**

Mr Petrus Van Der Walt Vermeulen will implement an incident reporting and 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).

No specific information requirements have been detailed by the Competent Authority.

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