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ENVIRONMENTAL IMPACT ASSESSMENT REPORT & ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR:

The proposed Prospecting Right to prospect for Diamonds Alluvial (DA) and Diamonds General (D) near Windsorton on the Remaining Extent and Portion 1 of Farm 102, Registration Division: Barkley West, Northern Cape province.

NAME OF APPLICANT	**Morgenson Mining (Pty) Ltd**
PREPARED BY	**Milnex CC**
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POSTAL ADDRESS:	P.O. Box 1086, Schweizer-Reneke, 2780
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REFERENCE NUMBER:	**NC30/5/1/1/2/11959PR**

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LIST OF APPENDIXES

PROJECT INFORMATION

Project Name:	Application for an Environmental Authorisation and subsequent Environmental Impact Assessment (Scoping and EIR-phase) for the Prospecting Right to prospect for Diamonds Alluvial (DA) and Diamonds General (D) near Windsorton on the Remaining Extent and Portion 1 of Farm 102, Registration Division: Barkley West, Northern Cape province.
DMRE ref:	NC30/5/1/1/2/11959PR
Report Title:	EIR & EMPr
Prepared By:	Milnex CC
Date:	24/07/2023

QUALITY CONTROL:		
	Report Author:	**Report Reviewer:**
Name:	Lizanne Esterhuizen Honours Degree in Environmental Science EAPASA reg: 2021/4429	N/A
Signature:		

DISCLAIMER:

The DFFE screening tool was used in compiling this document.

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.

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.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

(1) The environmental impact assessment process must be undertaken in line with the approved plan of study for environmental impact assessment.
(2) The environmental impacts, mitigation and closure outcomes as well as the residual risks of the proposed activity must be set out in the environmental impact assessment report.

OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

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

SCOPE OF ASSESSMENT AND CONTENT OF ENVIRONMENTAL IMPACT ASSESSMENT REPORTS

A. CONTACT PERSON AND CORRESPONDENCE ADDRESS

a) Details of:

i) The EAP who prepared the report

ii) Expertise of the EAP

Name of Practitioner	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
Christiaan Baron	Master's Degree in Environmental Management (M.ENV.MAN) (refer to **Appendix 1**)	Tel No.: (018) 011 1925 Fax No.: (053) 963 2009 e-mail address: christiaan@milnex-sa.co.za
Andile Grant 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 **Morgenson Mining (Pty) Ltd** as the independent environmental consultant to undertake the Scoping and EIA process for a Prospecting Right to prospect for Diamonds Alluvial (DA) and Diamonds General (D) near Windsorton on the Remaining Extent and Portion 1 of Farm 102, Registration Division: Barkley West, Northern Cape province. The property is located approximately 26 km South West of Warrenton on the gravel road on route to Windsorton 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 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.

Milnex CC has experience consulting 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:	1) The Remaining Extent of Farm 102 Extent: 1156.5428 hectares Title Deed: T906/1999 2) Portion 1 of Farm 102 Extension: 753.5921 hectares Title Deed: T1054/2013
Application area (Ha)	1910.1349 hectares

Magisterial district:	Frances Baard District Municipality Magareng Local Municipality
Registration division:	Barkly West
Distance and direction from nearest town	The property is located approximately 26 km South West of Warrenton on the gravel road on route to Windsorton in the Northern Cape Province.
21 digit Surveyor General Code for each farm portion	1) C00700000000010200001 2) C00700000000010200000
Minerals applied for	Diamonds Alluvial (DA) Diamonds General (D)
Locality map	Attach a locality map at a **scale not smaller than 1:250000 and attach as Appendix 2**

iii. Farm co-ordinates

Farms	Longitude	Latitude	Longitude	Latitude
1) Remaining Extent of Farm 102 2) Portion 1 of Farm 102	28° 15' 26,070"" S	24° 42' 39,042"" E	28° 16' 24,249"" S	24° 41' 58,942"" E
	28° 15' 14,379"" S	24° 42' 22,901"" E	28° 16' 18,794"" S	24° 41' 59,802"" E
	28° 14' 54,511"" S	24° 41' 52,159"" E	28° 16' 9,854"" S	24° 42' 0,292"" E
	28° 13' 41,584"" S	24° 40' 26,584"" E	28° 16' 3,402"" S	24° 42' 2,713"" E
	28° 12' 49,719"" S	24° 38' 38,008"" E	28° 15' 55,949"" S	24° 42' 7,168"" E
	28° 13' 34,576"" S	24° 37' 44,033"" E	28° 15' 46,250"" S	24° 42' 15,411"" E
	28° 15' 14,097"" S	24° 40' 5,457"" E	28° 15' 37,662"" S	24° 42' 21,266"" E
	28° 15' 49,589"" S	24° 40' 59,766"" E	28° 15' 32,992"" S	24° 42' 26,395"" E
	28° 16' 39,646"" S	24° 41' 52,231"" E	28° 15' 29,139"" S	24° 42' 33,114"" E
	28° 16' 37,020"" S	24° 41' 53,466"" E	28° 15' 26,277"" S	24° 42' 38,744"" E

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.

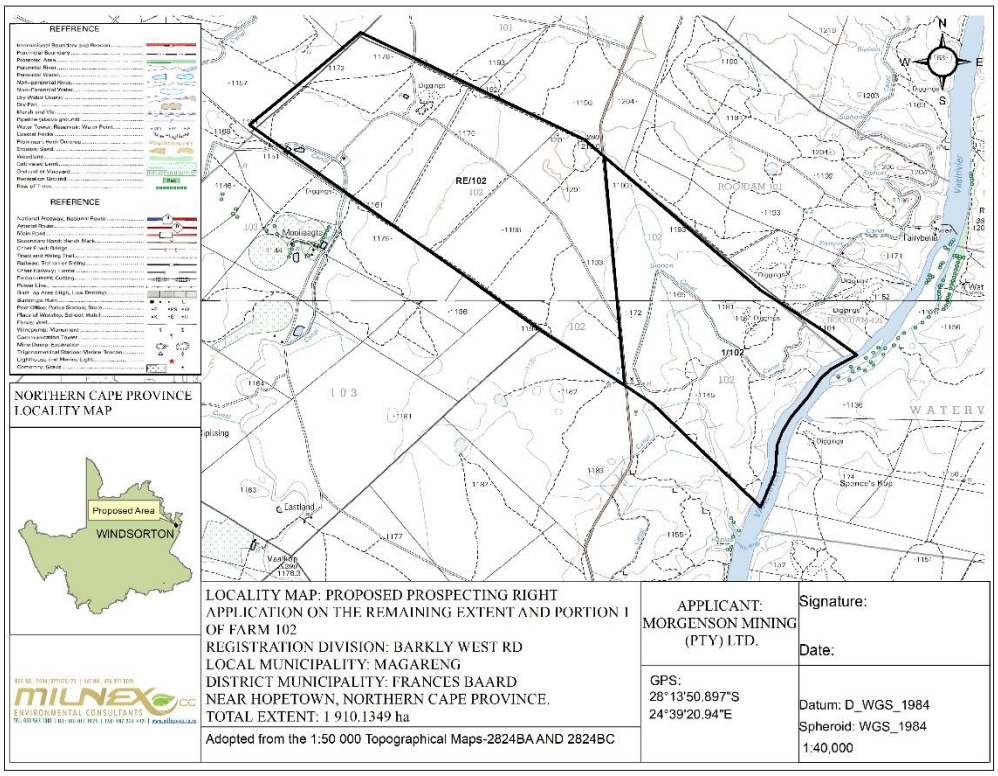

Figure 1: Locality Map of the proposed area

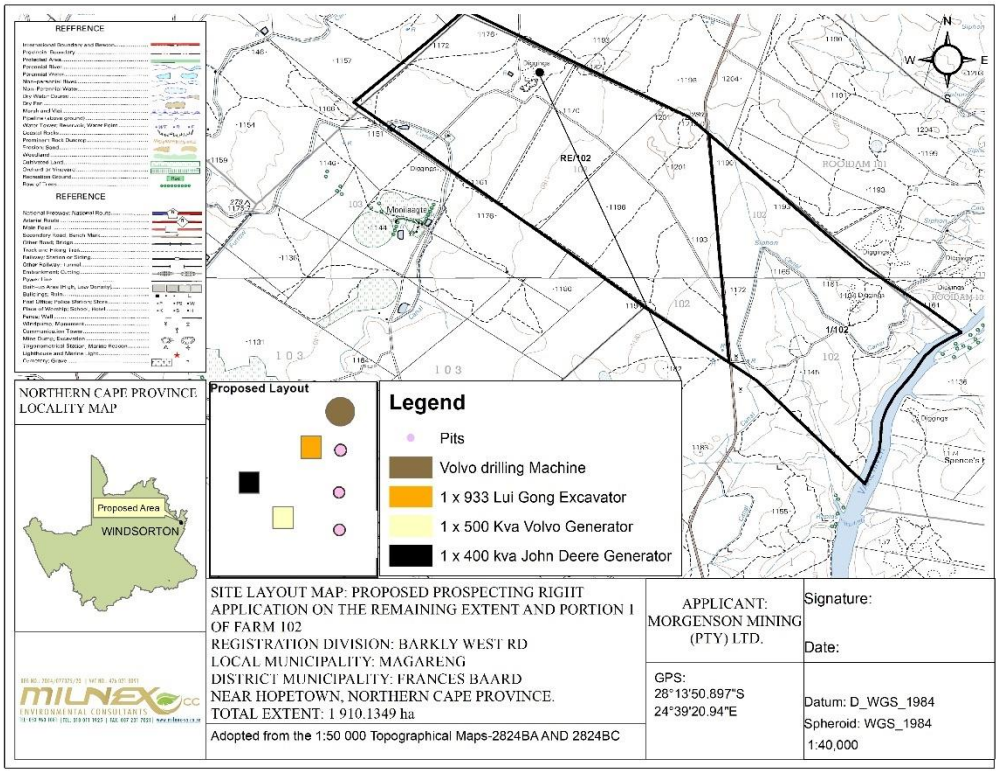

Figure 2: Site Plan

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

i) LISTED AND SPECIFIED ACTIVITIES

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)	**1)** ***Listing Notice 1, (GNR 327), Activity 9:*** *"The development of infrastructure exceeding 1 000 meters in length for the bulk transportation of water or storm water –* *(i) with an internal diameter of 0,36 metres or more: or* *(ii) with a peak throughput of 120 litres per second or more"* **2)** ***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 a watercourse;* **3)** **Listing Notice 1 (GNR 327), Activity 20 (Amended GNR 517: 2021):** *"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, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the prospecting right"* **4)** **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."* **5)** **Listing Notice 2 (GNR 325), Activity 19 (Amended GNR 517: 2021):** *"The removal and disposal of minerals which requires permission contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, Listing Notice 1 of 2014 or in Listing Notice 3 of 2014, required to exercise the permission.* **6)** **Listing Notice 3 (GNR 324), Activity 4:** *The development of a road wider than 4 metres with a reserve less than 13,5 metres.* ***(g) Northern Cape (ii)*** *Outside urban areas;* ***(ee)*** *Critical Biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority* **7)** **Listing Notice 3 GNR 324, Activity 10:** *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.* ***(g) Northern Cape (iii).*** *Outside urban areas:* ***(ee)*** *Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* **8)** **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)*** *Critical Biodiversity Areas as identified in biodiversity plans ".* Prospecting right with bulk samples for the prospecting of **Diamonds Alluvial (DA) & Diamonds General (D)** including associated infrastructure, structure and earthworks. **Please note the establishment or reclamation of residue stockpiles or residue deposits will still take place, but is now exempt from the list of Waste Management Activities (GNR 921, as amended)**

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: **<u>BULK SAMPLING: 270 000 tonnes</u>** **Pits:** 150 pits with dimensions of (5m x 3m x5m) **Trenches:** 50 trenches with dimensions (50m x 30m x5m) **Listing Notice 1, (GNR 327), Activity 9:** "The development of infrastructure exceeding 1 000 meters in length for the bulk transportation of water or storm water – (i) with an internal diameter of 0,36 metres or more: or (ii) with a peak throughput of 120 litres per second or more"	Extent of the proposed portions is 1910.1349 ha Concurrent backfilling will take place in order to rehabilitate.	X	Listing Notice 1, (GNR 327), Activity 9	
Prospecting Right: **<u>BULK SAMPLING: 270 000 tonnes</u>** **Pits:** 150 pits with dimensions of (5m x 3m x5m) **Trenches:** 50 trenches with dimensions (50m x 30m x5m) ***Listing Notice 1, (GNR327), 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 a watercourse;*	Extent of the proposed portions is 1910.1349 ha Concurrent backfilling will take place in order to rehabilitate.	X	Listing Notice 1: (GNR327), Activity 19	

Prospecting Right: **BULK SAMPLING: 270 000 tonnes** **Pits:** 150 pits with dimensions of (5m x 3m x5m) **Trenches:** 50 trenches with dimensions (50m x 30m x5m) **Listing Notice 1 (GNR 327), Activity 20 (Amended GNR 517: 2021): "***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, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the prospecting right"*	Extent of the proposed portions is 1910.1349 ha Concurrent backfilling will take place in order to rehabilitate.	X	Listing Notice 1 (GNR 327), Activity 20 (Amended GNR 517: 2021)	
Clearance of indigenous vegetation: **BULK SAMPLING: 270 000 tonnes** **Pits:** 150 pits with dimensions of (5m x 3m x5m) **Trenches:** 50 trenches with dimensions (50m x 30m x5m) **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."*	Extent of the proposed portions is 1910.1349 ha Concurrent backfilling will take place in order to rehabilitate.	X	Listing Notice 1, (GNR 327), Activity 27	-
Prospecting: **BULK SAMPLING: 270 000 tonnes** **Pits:** 150 pits with dimensions of (5m x 3m x5m) **Trenches:** 50 trenches with dimensions (50m x 30m x5m) **Listing Notice 2, GNR 325, Activity 19 (As amended GNR 517: 2021):** *"The removal and disposal of minerals which requires permission contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, Listing Notice 1 of 2014 or in Listing Notice 3 of 2014, required to exercise the permission.*	Extent of the proposed portions is 1910.1349 ha Concurrent backfilling will take place in order to rehabilitate.	X	Listing Notice 2, GNR 325, Activity 19 (As amended GNR 517: 2021)	-
Clearance of indigenous vegetation: **Listing Notice 3 GNR 324, Activity 4:** *The development of a road wider than 4 metres with a reserve less than 13,5 metres.* ***(g)*** *Northern Cape* ***(ii)*** *Outside urban areas;* ***(ee)*** *Critical Biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority*	Extent of the proposed portions is 1910.1349 ha Concurrent backfilling will take place in order to rehabilitate.	X	Listing Notice 3 GNR 324, Activity 4 (g)(ii)(ee)	

Listing Notice 3 GNR 324, Activity 10: *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.* ***(g) Northern Cape (iii).*** *Outside urban areas:* ***(ee)*** *Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	Extent of the proposed portions is 1910.1349 ha Concurrent backfilling will take place in order to rehabilitate.	X	Listing Notice 3 GNR 324, Activity 10 (g)(iii)(ee)	
Clearance of indigenous vegetation: **BULK SAMPLING: 270 000 tonnes** **Pits:** 150 pits with dimensions of (5m x 3m x5m) **Trenches:** 50 trenches with dimensions (50m x 30m x5m) **Listing Notice 3 GNR 324, Activity 12:** *"The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.* ***(g) Northern Cape (ii)*** *Critical Biodiversity Areas as identified in biodiversity plans ".*	Extent of the proposed portions is 1910.1349 ha Concurrent backfilling will take place in order to rehabilitate.	X	Listing Notice 3 GNR 324, Activity 12 (g)(ii)	-

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

Morgenson Mining (Pty) Ltd has embarked on a process for applying for a Prospecting Right to prospect for Diamonds Alluvial (DA) and Diamonds General (D) near Windsorton on the Remaining Extent and Portion 1 of Farm 102, Registration Division: Barkley West, Northern Cape province. These farms are preferred due to the sites expected mineral resources. **Morgenson Mining (Pty) Ltd** requires a prospecting right in terms of NEMA and the Mineral and Petroleum Resources Development Act to prospect for Diamonds Alluvial (DA) and Diamonds General (D) within the Magareng Local Municipality, Northern Cape Province (refer to a locality map attached in **Appendix 3**).

A DESCRIPTION OF HOW THE MINERAL RESOURCE AND MINERAL DISTRIBUTION OF THE PROSPECTING AREA WILL BE DETERMINED

DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES:
(These activities do not disturb the land where prospecting will take place e.g. aerial photography, desktop studies, aeromagnetic surveys, etc)

Phase 1 – Site Visits
A site visit will be conducted within 3 months after execution of the Prospecting Right. It is envisaged that the information will be obtained from the site visit to do the desktop studies and other prospecting activities.

Phase 2 – Desktop Studies
Desktop studies will be undertaken after the site investigation has was done to determine the target areas including the identification of any infrastructure to be build and any potential problems that may need to be addressed.

Phase 5 – Consolidation and Interpretation of Results Data
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. Each phase of prospecting will be followed by desktop studies involving interpretation and modeling of all data gathered and how the applicant will proceed with the work program in terms of activity, quantity, resources expenditures and duration. A pre-feasibility study will be done to determine the preliminary economic assessment of the resource and to determine whether additional evaluation of the deposit will be warranted to increase confidence in the resource estimation. Prospecting work will be conducted by a multi-disciplinary team to determine whether the resource can be viable exploited and if the results can support an application for a mining right.

DESCRIPTION OF PLANNED INVASIVE ACTIVITIES:
(These activities result in land disturbances e.g. sampling, drilling, bulk sampling, etc)

Phase 3 – Pitting
The information obtained from the desktop studies will be used to draw up a pitting map. The location and GPS coordinates of where pits will be digged, will be indicated on this map (pitting location map). Pits will then be digged by an excavator on these mapped coordinated points. If gravel is found the applicant will determine the composition and quality of the gravel. It is envisaged that the pits will determine the location and intersection of mineralization.

It is planned that only 50 pits will be excavated a year. It may be more if the process is quicker than planned for. No more than 150 pits shall be excavated in total.

Calculations
It is planned that 150 pits will be dug (it may be less depending on the results) at an extent of 5m (length) x 3m (width) x 5m (depth).

Timeframe: ± 2 years (month 7 - 36)		
Pits per year	150 pits / 2 years =	50 pits dug per year
Total area to be disturbed per year:	75 pits x (5m x 3m) / 10 000 =	0.11 Ha disturbed per year
Total area disturbed for 24 months	150 pits x (5m x 3m) / 10 000 =	0.23 Ha disturbed

Phase 4 – Trenches

The applicant will proceed with this way of prospecting by means of the open cast / trenching method, simultaneously or after pitting and depending on the results. The location where the trenches will be digged, will be determined after the gravel has been located by conducting the desktop studies and the digging of pits. The trenches will be digged on the parts of the property where the gravel is located. Trenches will be sited on the resource map according to the coordinate of each of the trenches made. The trenches will be digged to remove and wash the gravel. It will be washed by a 16 feet washing pan to determine diamond proceeds per 100 ton of gravel. The trenches will be sited to determine the geological representivity. Overburden will be stripped and placed next to the trench as determined in the EMP. Gravel will be removed and transported to the plant to be washed. Tailings will be returned to the excavation to fill it up. Hereafter overburden will be dumped in the excavation where after topsoil will be placed in the excavation.

Rehabilitation will be done concurrently.

Calculations

It is planned that 50 trenches will be dug at an extent of 50m (length) x 30m (width) x 5m (depth).

Timeframe: ±3 years (month 7 - 48)		
Trenches per year	50 trenches / 3 years =	16.7 trenches dug per year
Total area to be disturbed per year:	16.7 trenches x (50m x 30m) / 10 000 =	2.5 Ha disturbed per year
Total area disturbed for ±3 years	50 trenches x (50m x 30m) / 10 000 =	7.5 Ha disturbed

Prospecting activities and phases

Please find the Prospecting Work Programme attached as **Appendix 9**.

Water uses:

Water uses under section 21 a-k of the NWA may be triggered, thus a Water Use Licence Application (WULA) will needed in cases there will be encroachment. When needed a WULA will be lodged with the department of Water & Sanitation (DWS).

Table 1: Water Use Pan Size specifications for Alluvial Diamond Mining (DWS NC & FS, 2001).

Pan size	Water/hour (m^3)	Water/day(m^3)	Gravel/hour (tons)	Gravel/day (ton)
16	17	170	60	600

Since 4 x 16 feet washing pan will be used, the amount of water for the pans will be 68 000 L/hour from which 30% is re-used.

Dust suppression

It was the intention of the applicant to implement dust management on site to determine if unacceptable levels of dust fallout occur. Monitoring compliance with the requirements of the National Dust Control Regulations for an activity, in terms of nuisance or disturbance.

The National Framework for Air Quality Management in the Republic of South Africa (the National Framework), as published under Government Notice No. 1144 of 26 October 2018, underpins NEM:AQA by providing national norms and standards for air quality management to ensure compliance with legislation. The National Framework serves as the country's AQMP.

Section 32 of the NEM:AQA makes provision for the Minister or the MEC to prescribe measures for the control of dust in specific places or areas, or by specified machinery or in specific instances. While dust generally does not pose a health risk, it may be

regarded as a nuisance. It is the responsibility of the owner of the dust generating activity to take reasonable measures to limit the nuisance factor.

With respect to this, the Minister has published in the gazette the regulations for the control of dust in 2013 (Notice 827, Government Gazette No. 36974). These regulations provide requirements for measures for the control of dust, which includes the requirements for monitoring, dust management plan development and implementation and reporting.

According to dust levels set out by the National Dust Control Regulations 2013 (GNR. 827). The limits have the following threshold Section 3. Dustfall standard.

Table 1. Acceptable dust fall rates

Restriction Areas	***Dustfall rate (D) (mg/m2/day, 30-day average)***	***Permitted frequency of exceeding dust fall rate***
Residential Area	*D < 600*	*Two within a year, not sequential months*
Non-residential Area	*600 < D < 1200*	*Two within a year, not sequential months*

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.

Types of lubricants should be dependent on the machines used, this will include diesel, fuel and oil. It should be noted that no more than 80 000 cubes metres of diesel may be stored on site.

List of equipment's & infrastructure

List of equipment	
1 x 400 kva John Deere Generator	1 x 856 Lui Gong Front End Loade
1 x 500 Kva Volvo Generator	1 x 856 Lui Gong Front End Loader
1 x Finlay 883 + Screen	1 x 856 Lui Gong Front End Loader
1 x Finlay 663 Screen	1 x 856 Lui Gong Front End Loader
1 x Bell B25 Dumper	4 x 16 Ft Washing Pan
1 x Bell B30 Dumper	1 x Man 26 480kw Truck with Trailer
1 x Bell B30 Dumper	1 x Dyna 3 Ton
1 x Bell B40 Dumper	1 x Tata Bus 32 Seater
1 x 933 Lui Gong Excavator	1 x Mahindra LDV
1 x 933 Lui Gong Excavator	1 x Toyata D4D 3.0
1 x 933 Lui Gong Excavator	1 x Toyata D4D 3.0

Prospecting activities and phases

Please find the Prospecting Work Programme attached as **Appendix 9**.

E. POLICY AND LEGISLATIVE CONTEXT

(a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy 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
Mineral and Petroleum Resources Development Regulations, 2014.	Department of Mineral Resources & Energy (DMRE)	
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
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		
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
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
National Environmental Management: Protected Areas Act 57 of 2003		
Hazardous Substances Act (No. 15 of 1979)		
Subdivision of Agricultural Land Act (No. 70 of 1970)		
Occupational Health and Safety Act (No. 85 of 1993)		
Mine Health and Safety Act (No. 29 of 1996)		
Government Notice Regulation 704 of 1999		
Frances Baard District Municipality Integrated Development Plan (IDP)	Municipal	
Magareng Local Municipality Integrated Development Plan (IDP)	Municipal	

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	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: *"Everyone has the right –* *(a) to an environment that is not harmful to their health or well-being; and* *(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –* *i) prevent pollution and ecological degradation;* *ii) promote conservation; and* iii) *secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."* 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.
National Environmental Management Act No. 107 of 1998 as amended.	S24(1) of NEMA S28(1) of NEMA	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. 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.
EIA regulations as amended under NEMA	Listing notice 1 Listing notice 2 Listing Notice 3	The National Environmental Management Act107 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.
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	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. 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)). 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.
National Environmental Management: Biodiversity Act No. 10 of 2004	Chapter 4 Chapter 5	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). 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 to prevent the introduction and spread of alien species and invasive species, also to manage, control and eradicate alien species and invasive species

National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004).	Section 21	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. 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.
National Water Act, 1998 (Act No. 36 of 1998).	Section 21	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. 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.
National Forest Act (Act 84 of 1998) (NFA)	Regulation 7	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). Regulation 7 from the Act states the following: **Prohibition on destruction of trees in natural forests.** (1) No person may - (a) cut, disturb, damage or destroy any indigenous tree in a natural forest; or (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- (i) a licence issued under subsection (4) or section 23; or (ii) an exemption from the provisions of this subsection published by the Minister in the Gazette on the advice of the Council.
National Veld & Forest Fires Act (Act 101 of 1998)	Regulation 13 Chapter 5	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.

Conservation of Agricultural Resources Act (Act No. 85 of 1983)		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. 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.
National Infrastructure Plan		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. Government will over the three years from 2013/14 invest R827 billion in building and upgrading existing infrastructure. 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. 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.
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
Mine Health and Safety Act (No. 29 of 1996)		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. The following principles are considered applicable to the Proposed Project and are detailed below: • 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. The Act also contains innovative approaches to the investigation of accidents, diseases and other occurrences that threaten health and safety.
Government Notice Regulation 704 of 1999		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: • 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.

		GNR.704 also stipulates that no person in control of a mine or activity may: 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; 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 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.

F. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

(a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred [location] development footprint within the approved site as contemplated in the accepted scoping report;).

Mineral rights have been applied for all around the proposed site, and the outcome of that studies suggest the possibility of encountering further diamond deposits.

Economic activity in modern-day South Africa has been centred 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. A MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT

(-within the approved site as contemplated in the accepted scoping report;)

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 location of the site is preferred due to the presence of shallow diamond. Access will be obtained from existing tar and gravel roads.

As discussed in the previous section, based on outcomes of previous studies in the vicinity of the proposed site, the possibility to encounter high volumes of Diamonds Alluvial (DA) and Diamonds General (D) near Windsorton on the Remaining Extent and Portion 1 of Farm 102, Registration Division: Barkley West, Northern Cape province, were identified.

The property has existing homestead, livestock kraals and historic mining.

HISTORIC MINING

From the topographical map, historic google earth satellite images and the site visit conducted, the proposed portions have historic diggings. Clear Google Earth satellite imagery goes back only to 2004, and the disturbance is visible in the 2004 satellite image below. The disturbance may pre-date 2004.

It should be noted that outstanding rehabilitation, from previous mining related activities by unknown right holder/s, is present on site and **Morgenson Mining (Pty) Ltd** will not take responsibility to rehabilitate the areas. However, if Morgenson Mining (Pty) Ltd is to prospect on the disturbed areas, they will rehabilitate the areas they disturbed.

It is unknown who disturbed the area by conducting mining related activities.

Refer to Figure 3 below of the location of the historic mining disturbances.

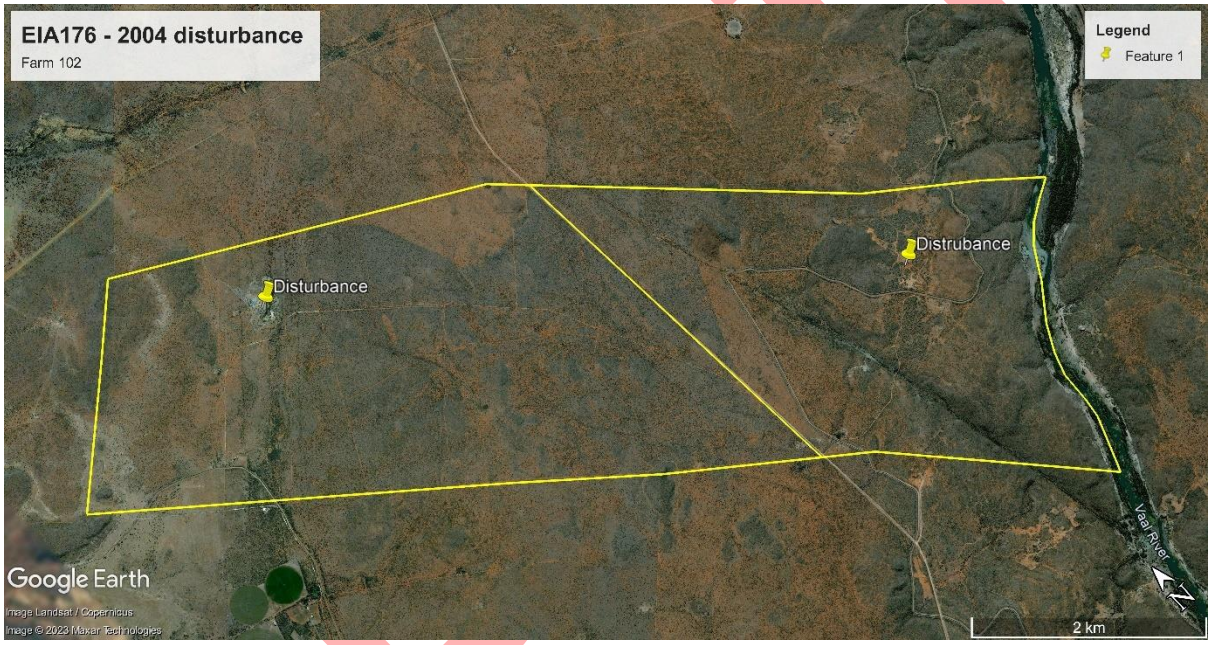

Figure 3: Location of disturbances from historic mining.

Preferred activity

The prospecting of diamonds alluvial is the optimum preferred activity for the site. The shallow diamond deposits make the site ideal for alluvial diamond mining. The mine will provide significantly more job opportunities than what is providing currently.

Another activity that can be exercised is livestock grazing.

H. A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT

(-within the approved site as contemplated in the accepted scoping report, 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. It is expected that the Diamonds Alluvial (DA) and Diamonds General (D) been deposited on this farm and therefore the applicant would like to commence with their prospecting activities.

  The proposed area also does not have existing mineral rights allocated to it as the prospecting right application was accepted by the DMRE.

- **Activity alternatives**

  The environmental impact assessment process also needs to consider if the development of an alluvial diamond mine would be the most appropriate land use for the particular site.

  Prospecting of other commodities –from the surface and desktop assessment indicates that there are no indications that there are other commodities to be mined on the site, except alluvial diamond.

  The proposed area is also used for livestock grazing however prospecting is the preferred activity the applicant wants to pursue.

- **Design and layout alternatives**

  Design alternatives were considered throughout the planning and design phase (i.e. where is the diamond bearing gravel located?). In this regard discussions on the design were held between the EAP and the developer. The layout follows the limitations of the site and aspects such as, roads, site offices and workshop area.

  The location of the activities will be determined based on the location of the prospecting activities, which will only be determined during phase 1 of the Prospecting Work Programme (see **Appendix 9** for the PWP).

  The layout follows the limitations of the site and aspects such as, roads, site offices and workshop area. All 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 activities will commence with a site investigation and desktop studies, which will comprise of non-invasive techniques. This manner of survey will ensure that the applicant can clearly delineate areas which are suitable for further investigation and no unnecessary surface disturbance will be undertaken.

Based on the outcome of the desktop studies and site investigation, pits will be dug by an excavator for the purpouse of soil sampling. If gravel is found, the applicant wil determine the the composition and quality of the gravel.

The applicant will proceed with this way of prospecting by means of the open cast/trenching method, simultaneously or after pitting depending on the information obtained from the earlier work done. The trenches will be dug to remove and wash the gravel. It will be washed by a 10-18 feet washing pan to determine diamond proceeds per 100 tons of gravel.

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

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

- **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. The site is currently zoned for agricultural land uses. 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 9**) 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 do pitting and trenching, remove the diamond bearing gravel with an excavator, depositing it in the 10 – 18 feet rotary pan(s) to be washed and sorted. Please find the Prospecting Work Programme attached as **Appendix 9**.

  Dense Media Separation (DMS)

  Pros & Cons of the alternative **Dense Media Separation (DMS)**

Advantages	Disadvantages
DMS plants is used mostly for kimberlite deposits	10 times more expensive than Rotary pan
	Water consumption is high
	Operating costs are expensive

  In a Dense Media Separation (DMS) plant, powdered ferrosilicon (an alloy of iron and silicone) is suspended in water to form a fluid near the density of diamond (3.52 g/cm3), to which the diamond bearing material is added to begin the separation process of the heavier minerals from the lighter material. Additional separation of the denser material occurs by centrifuge in "cyclones" that swirl the mixture at low and high speeds, forcing the diamonds and other dense minerals to the walls and then out the bottom of the cyclone. Waste water rises at the center of the cyclones and is sucked out and screened to remove waste particles. The DMS process results in a concentrate that generally weighs less than one percent of the original material fed into the plant at the beginning of the process.

  Rotary Pan Plants

  Pros & Cons of the alternative **Rotary Pan Plants**

Advantages	Disadvantages
More cost effective	The industry perception that Rotary Pan Plants yield poorer diamond recoveries
Readily available	

Generate more work opportunities	
Consume less water	
Rotary Pan Plants are most often used when mining alluvial deposits	

In a Rotary Pan plant, crushed ore, when mining kimberlite, or alluvial gravel and soil is mixed with water to create a liquid slurry called “puddle” which has a density in the 1.3 to 1.5 g/cm3 range. The mix is stirred in the pan by angled rotating “teeth”. The heavier minerals, or “concentrate”, settle to the bottom and are pushed toward an extraction point, while lighter waste remains suspended and overflows out of the centre of the pan as a separate stream of material. The concentrate, representing just a small percentage of the original kimberlite ore or alluvial gravels, is drawn off for final recovery of the diamonds.

Both methods are in actual fact used for bulk material reduction and require a further process for the final diamond recovery however, for this project the Rotary Pan will be used.

Dust Suppression

When it comes to dust suppression two main methods were considered, namely molasses stillage and the wetting (water) of roads. The table below provides a short summary of the advantages and disadvantages of each.

Water	Molasses stillage
More cost effective	Much more expensive
Could lead to the depleting of water resources	Requires less water
No damage (only if used excessively)	The product may be toxic to aquatic organisms. (As this product could have physical effects on aquatic organisms for e.g. floating, osmotic damage)
No harm to humans or animals (Only a high quantity will have harm to humans or animals)	Not Hazardous or toxic. Could cause irritation to eyes, skin or when ingested and inhaled.
Non-flammable	Non-flammable
Eye-wash fountains not needed	Eye-wash fountains in the work place are strongly recommended
	Working procedures should be designed to minimize worker exposure to this product.
Basic storing methods	Storing methods are a bit more complicated. Should be stored in a plastic, plastic lined or stainless steel, tight closed containers between 5 and 40 degrees Centigrade.

Considering the above mentioned information, water will be used for dust suppression purposes.

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.

SCOPING PHASE
NEWSPAPER ADVERTISEMENT

An advertisement was placed in English in the local newspaper (**Noordkaap Bulletin**) on the **02 March 2023** advertisement (see **Appendix 6**) notifying the public of the EIA process and requesting Interested and Affected Parties (I&APs) to register with, and submit their comments to Milnex CC. I&APs were given the opportunity to raise comments within 30 days of the advertisement.

8 NUUS NEWS — NoordkaapBulletin 2 Maart 2023

Oud-inwoner (83) gegroet

Boek-genieting gedy in Petrusburg

NOTICE OF APPLICATION FOR A WATER USE LICENSE

Notice is given in terms of Section 41(4) of the National Water Act, 1998 (Act no. 36 of 1998) (hereon further referred to as the act) for the Water Use License Application in terms of Section 40 of the act for the agricultural activities on Farm 152, the remaining extent of portion 18 of the farm Machorogan 106, and portion 6 (portion of portion 4) and portion 22 (portion of portion 4) of the farm Spitskop 91, situated near to Delportshoop, Registration Division Barkly West RD, Northern Cape province.

Project title: Proposed Water Use License Application of Jen Co Farming (Pty) Ltd for the agricultural activities of Jen Co Farming (Pty) Ltd on Farm 152, the remaining extent of portion 18 of the farm Machorogan 106, and portion 6 (portion of portion 4) and portion 22 (portion of portion 4) of the farm Spitskop 91, situated near to Delportshoop, Registration Division Barkly West RD, Northern Cape province.

Project description: Water Use Licence Application of Jen Co Farming (Pty) Ltd for Section 21(a) of the National Water Act, 1998 (Act No. 36 Of 1998) for the agricultural activities on Farm 152, the remaining extent of portion 18 of the farm Machorogan 106, and portion 6 (portion of portion 4) and portion 22 (portion of portion 4) of the farm Spitskop 91, situated near to Delportshoop, Registration Division Barkly West RD, Northern Cape province. The property is located approximately 28 km North East of Delportshoop.

Size of site: Total extent of the site is 3 866,21 ha
Proponent: Jen Co Farming (Pty) Ltd
Co-ordinates: -28.255082° 24.456125° / -28.212836° 24.406758° / -28.215294° 24.445014°

Any inquiries/objections must be lodged in writing or verbally if unable to write to the below mentioned consultants:

Consultant: Grietjie Stander, Milnex CC Environmental Consultants. Tel: 018 011 1925. Fax: 087 231 7021. E-mail: grietjie@milnex-sa.co.za. Postal Address: P.O Box 1086, Schweizer-Reneke, 2780

The Water Use License Application (WULA) will be submitted to the Department of Water and Sanitation. In order to ensure that you are identified as an interested and/or affected party please submit your name, contact information and interest in the matter, in writing or verbally to the contact person given above within 60 days of this advertisement (Advertisement date: 2nd March 2023).

NOTICE OF APPLICATION FOR A PROSPECTING RIGHT AND SUBSEQUENT ENVIRONMENTAL IMPACT ASSESSMENT

Notice is given in terms of Section 16 and 10 of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations 3, 5 & 51 of the Regulations published in Government Notice GN R527. Notice is also given, in terms of the EIA Regulations published in Government Notice no. 326 under Section 39-44 of the National Environmental Management Act (Act no. 107 of 1998), of the intent to carry out an Environmental Impact Assessment (i.t.o. Listing Notice 1 of 2017, GNR 327 [Activity 9, 19, 20 & 27 (as amended, GNR517)] in Gazette No. 40772, Listing Notice 2 of 2017, GNR 325 [Activity 19, (as amended, GNR517)] in Gazette no. 40772 & Listing Notice 3 of 2017, GNR 324 [Activity 4, 10 & 12] in Gazette No. 40772 of the intent to carry out the activity mentioned above

Project title:
Environmental Impact Assessment (Scoping & EIR-process) for the proposed Prospecting Right application to prospect for Diamonds Alluvial (DA) & Diamonds General (D) near Windsorton on the Remaining Extent and Porton 1 of Farm 102, Registration Division: Barkly West, Northern Cape province.

Project description:
Environmental Impact Assessment (Scoping & EIR-process) for the proposed Prospecting Right application to prospect for Diamonds Alluvial (DA) & Diamonds General (D) near Windsorton on the Remaining Extent and Porton 1 of Farm 102, Registration Division: Barkly West, Northern Cape province. The property is located approximately 26 km Southwest of Warrenton on the gravel road on route to Windsorton in the Northern Cape Province.

Size of site:	1910.1349 hectares
Proponent:	Morgenson Mining CC
DMRE ref:	NC30/5/1/1/2/11959PR

Co-ordinates	
28° 15' 26.070"S	24° 42' 39.042"E
28° 12' 49.719"S	24° 38' 38.006"E
28° 13' 34.576"S	24° 37' 44.033"E
28° 16' 39.646"S	24° 41' 52.231"E

Any inquiries/objections must be lodged in writing or verbally if unable to write to the below-mentioned consultants

Environmental Consultant:	Milnex CC
	Lizanne Esterhuizen / Christiaan Baron / Percy Sehaole / Andile Grant
Tel:	018 011 1925
Fax:	087 231 7021
E-mail:	lizanne@milnex-sa.co.za / christiaan@milnex-sa.co.za / percy@milnex-sa.co.za / andile.grant@milnex-sa.co.za
Postal Address:	PO Box 1086, Schweizer-Reneke, 2780

A meeting will be conducted upon request by the I&APs, by means of a virtual (Zoom or Microsoft Teams) or a physical meeting, whichever is preferred.

The **Environmental Impact Assessment** application will be submitted to the Department of Mineral Resources & Energy. To ensure that you are identified as an interested and/or affected party please submit your name, contact information and interest in the matter, in writing or verbally to the contact persons given above **within 30 days of this advertisement.**

SITE NOTICES

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

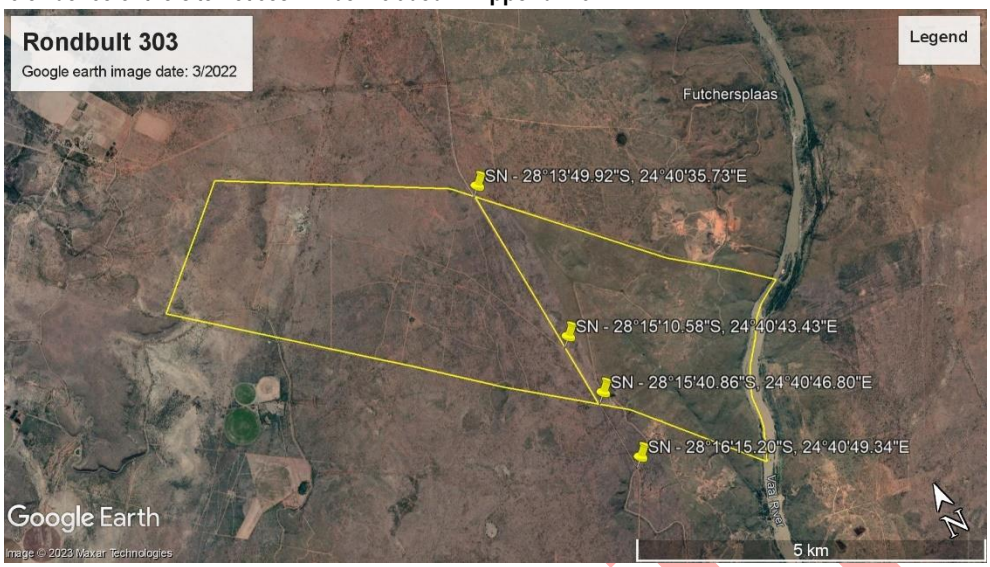

Figure 4: Site notices placement

DIRECT NOTIFICATION AND CIRCULATION OF SCOPING REPORT TO IDENTIFIED I&APS, SURROUNDING LANDOWNERS AND OCCUPIERS

Identified I&APs, including key stakeholders representing various sectors, are directly informed of the proposed development and the availability of the Scoping Report via registered post on **22 February 2023** and were requested to submit comments by **25 March 2023.** 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:

LIST OF STAKEHOLDERS, LANDOWNERS, & SURROUNDING LANDOWNERS

Stakeholders
Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (AGRINC)
Department of Forestry, Fisheries and the Environment (DFFE)
Department of Economic Development and Tourism (DEDAT)
Department of Co-operative Governance, Human Settlements and Traditional Affairs (COGHSTA)
Department of Roads and Public Works (DR&PW)
Department of Transport, Safety and Liaison (DTSL)
Department of Social Development (DSD)
Northern Cape Tourism Authority (NCTA)
Northern Cape Heritage Resources Authority (NCHRA)
Department of Mineral Resources and Energy (DMRE)
Department of Water and Sanitation (DWS)
Frances Baard District Municipality: Municipal manager
Magareng Local Municipality: Municipal manager
Magareng Local Municipality: Ward 5 Councillor
WESSA
Landowner
Tiradeprops 1073 CC
Aurora Boerdery Trust:

Surrounding landowners
Tiradeprops 1073 CC
Mokgosi Family Communal Property Association Northern Cape Department of Agriculture, Rural Development and Land Reform on behalf of CPA
Dikgatlong Local Municipality
Gabriel Eduard du Toit
GF Ziegler Family Trust
Hermanus Marthinus van der Westhuizen
Morgenson Mining Pty Ltd
Hunt Family Trust

EIR PHASE

NEWSPAPER ADVERTISEMENT

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

SITE NOTICES

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

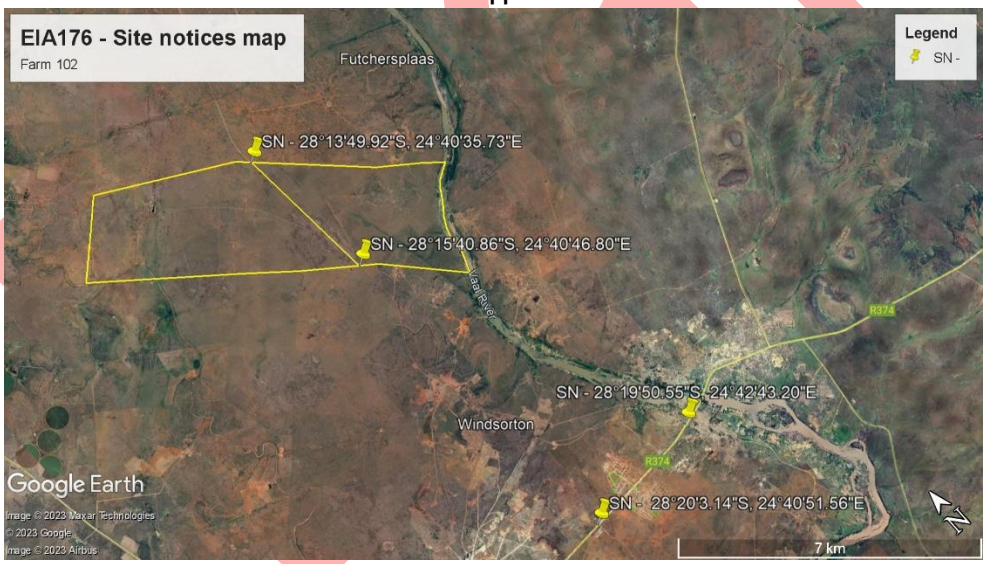

Figure 5: Site notices placement

DIRECT NOTIFICATION AND CIRCULATION OF DRAFT EIR & EMPR INCLUSIVE OF SPECIALIST STUDIES TO IDENTIFIED I&APS, LANDOWNERS AND OCCUPIERS

Identified I&APs, including key stakeholders representing various sectors, are directly informed of the proposed development and the availability of the Draft EIR & EMPr via registered post on **25 July 2023** and were requested to submit comments by **25 August 2023.** 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:

LIST OF STAKEHOLDERS, LANDOWNERS, & SURROUNDING LANDOWNERS

Stakeholders
Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (AGRINC)
Department of Forestry, Fisheries and the Environment (DFFE)
Department of Economic Development and Tourism (DEDAT)
Department of Co-operative Governance, Human Settlements and Traditional Affairs (COGHSTA)
Department of Roads and Public Works (DR&PW)
Department of Transport, Safety and Liaison (DTSL)
Department of Social Development (DSD)
Northern Cape Tourism Authority (NCTA)
Northern Cape Heritage Resources Authority (NCHRA)
Department of Mineral Resources and Energy (DMRE)
Department of Water and Sanitation (DWS)
Frances Baard District Municipality: Municipal manager
Magareng Local Municipality: Municipal manager
Magareng Local Municipality: Ward 5 Councillor
WESSA
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Aurora Boerdery Trust:
Surrounding landowners
Tiradeprops 1073 CC
Mokgosi Family Communal Property Association Northern Cape Department of Agriculture, Rural Development and Land Reform on behalf of CPA
Dikgatlong Local Municipality
Gabriel Eduard du Toit
GF Ziegler Family Trust
Hermanus Marthinus van der Westhuizen
Morgenson Mining Pty Ltd
Hunt Family Trust

LANDOWNER CONSULTATION

Landowner consultation still in process.

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. However, please note the comments will only be included in the final report to be submitted to the DMRE, and is not available within the draft report.

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 List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		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
Organisation	**Contact person**			
Landowners				
Farm 1/102				
Farm RE/102				
Surrounding Landowners				
Gordonia 3/97				
Farm RE/103				
Gordonia 1/97				
Rooidam 0/101 & 1/101				
Waterval 1/14				

Erf 0/2002				
Erf 0/2001				
Waterval RE/14				
Erf 363				
The Municipality in which jurisdiction the development is located				
Magareng Local Municipality	Municipal Manager:			
Municipal councilor of the ward in which the site is located				
Magareng Local Municipality	Ward 5 Councillor			
Organs of state having jurisdiction				
Department of Agriculture, Environmental Affairs, Rural Development and Land Reform (AGRINC)				
Department of Forestry, Fisheries and the Environment (DFFE)				
Department of Economic Development and Tourism (DEDAT)				
Department of Co-operative Governance, Human Settlements and Traditional Affairs (COGHSTA)				
Department of Roads and Public Works (DR&PW)				

Department of Transport, Safety and Liaison (DTSL)				
Department of Social Development (DSD)				
Northern Cape Tourism Authority (NCTA)				
Northern Cape Heritage Resources Authority (NCHRA)				
Department of Mineral Resources and Energy (DMRE)				
Department of Water and Sanitation (DWS)				
Commission on Restitution of Land Rights.				
Other–				
Frances Baard District Municipality	Municipal Manager			
WESSA				
SAHRA				

iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

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.

DFFE Screening Report

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	12/12/20/2024	Solar CSP and PV	Approved	28.1
2	14/12/16/3/3/1/505	Solar PV	Approved	25.2
3	14/12/16/3/3/1/429	Solar PV	Approved	17.3
4	14/12/16/3/3/2/307	Solar PV	Approved	28.9

Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

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
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			

A Terrestrial Biodiversity and Wetland Impact Assessment was conducted by Reuben van Breda an Ecologist from Milnex CC and externally reviewed by Mari van der Westhuizen. The report is available under **Annexure 12**. Please see the below table for some of the findings:

4.1 Vegetation units and sensitive areas

The Study site can be divided into different vegetation units (Figure 13) based on land use, wetness, and vegetation structure. The vegetation units identified on site were divided, grouped, and discussed below.

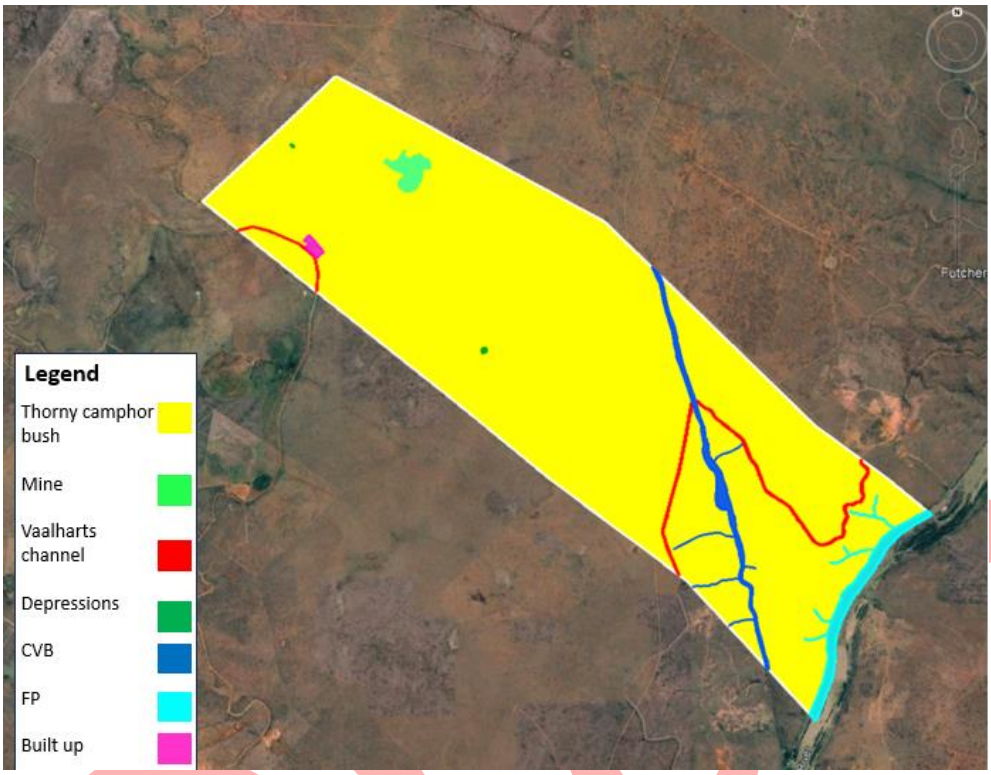

Figure 1: Vegetation units and areas identified on site.

Old mine

An area of roughly 13 hectares on the northeastern corner of the application area has historically been mined, resulting in an area with "mountainous" terrain of relatively bare soil dominated by trees (Tarconanthus camphoratus, Searsia lancea, Vachellia karroo, Vachellia erioloba, Vachellia tortillis, and Ziziphus mucronata). A large dam is located within this area where water has accumulated at the lowest point of the mine. Spoor of wild Warthog and Kudu were found within the application area, and this area supported a large number of avifaunal species.

Figure 2. Present state of the mine on the application area.

5 SENSITIVITY ANALYSIS

Most of the study site is largely natural, presenting a baseline Medium sensitivity (Figure 16). One area on site has been transformed by historic mining operations, resulting in a disturbed landscape, whilst another small area consists of an urban built-up area. Both of these areas present a Low sensitivity. The natural wetlands on the application area (Channeled valley bottom, Floodplain wetland, Depressions 1 & 2) presented High sensitivity due to their overall natural or near-natural state, as well as high provisioning of habitat and ecosystem services compared to other areas within the application unit. Due to its importance in water provisioning (not only on the application area but on many other farm portions beyond the application area) Vaalharts channel portions on the application area also exhibit a High sensitivity. Taking into account the various plant and animal species mentioned in the previous section, as well as where on the application area they are known to occur, the entire of the RE (northern Portion) of the farm is afforded a very High sensitivity (Figure 17). This is due to the presence of multiple faunal Species of Conservation Concern and Specially Protected species, as well as one protected plant species (Vachellia erioloba).

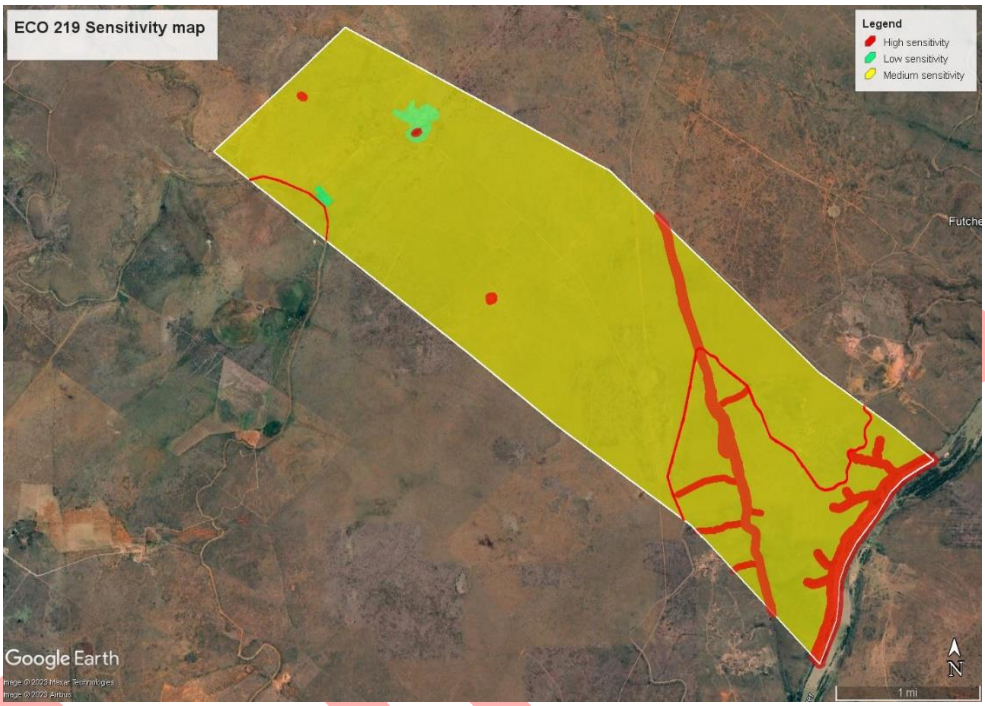

Figure 16: Sensitive areas of the Application site

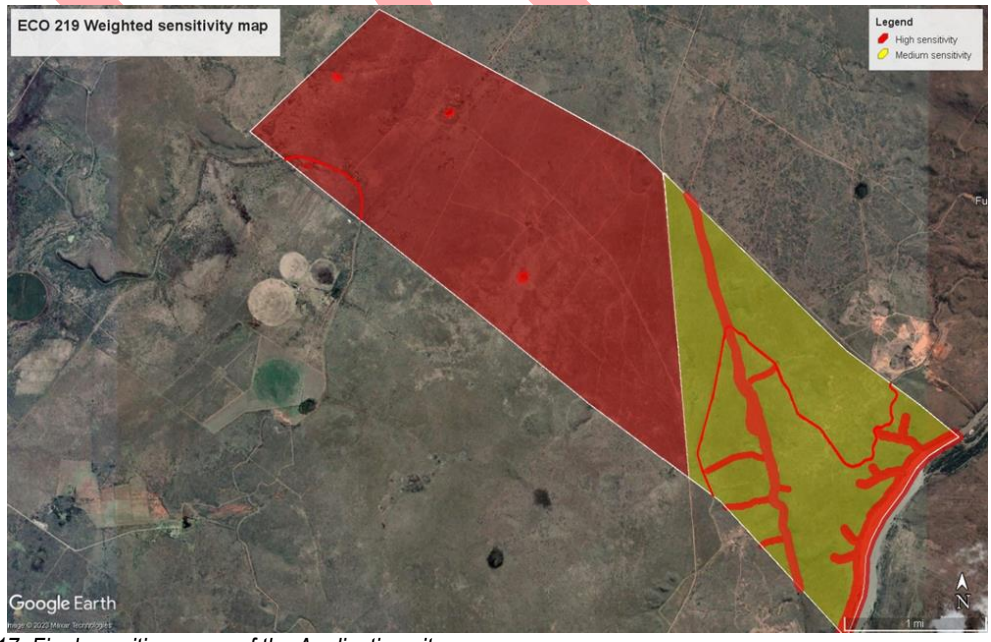

Figure 17: Final sensitive areas of the Application site

(a) Type of environment affected by the proposed activity.
(its current geographical, physical, biological, socio- economic, and cultural character).

GEOLOGY AND SOILS

The geology of the farm may be summarized: A flat piece of ground where a layer of unconsolidated sediment overlies Ventersdorp Lava.

Ventersdorp Lava
The rock is an amygdaloidal andesite with an uneven eroded upper surface.

Rooikoppie Conglomerate
The Rooikoppie is a thin matrix-supported conglomerate of resistant pebbles of agate, chert and banded ironstone set in a reddish-brown matrix of sand and clay. This conglomerate which is found over large areas of the Northern Cape, was probably formed by outwash and deflation on extensive plains and pediments.

It is well-known to prospectors and diggers as it is diamondiferous in places.
On the farm the full extent and variations in thickness could not be determined as it is exposed in one abandoned prospecting pit only.

In the pit a thin layer of Rooikoppie 15 to 20cm thick, overlies the Ventersdorp Anmdesite. The Rooikoppie is in turn overlain by up to 30cm of sand and gravel. Finally a drape of up to 30cm of reddish-brown windblown sand covers everything.

The surface slopes almost imperceptibly towards the east due to sheet erosion by rainwater. Here two small outcrops of lava can be seen. Of more interest is the strip of deflated gravel and sand with pebbles of agate, chert and banded ironstone occurring as a surface scatter.

ECOLOGICAL HABITAT AND LANDSCAPE FEATURES

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

3.3 Regional Vegetation Assessment
The proposed site for prospecting overlaps completely with the Savanna Biome (Mucina & Rutherford, 2006). Biomes are further divided into bioregions, which are spatial terrestrial units possessing similar biotic and physical features, and processes at a regional scale. The study site overlaps with the Eastern Kalahari Bushveld Bioregions and, more specifically, the Kimberley Thornveld (SVk4) and Schmidtsdrif Thornveld (SVk6) vegetation types. There is also a small area of Highveld Alluvial Vegetation (AZa5) occurring on site at the Southernmost border of the application area (Figure 8). Table 6 below provides an overview of the vegetation types associated with the study site.

Table 6: *Vegetation types and their ecological importance*

Vegetation Type	Biome	Bioregion	Conservation Status
Kimberley Thornveld (SVk4)	Savanna	Eastern Kalahari Bushveld	Least Threatened 16% Target 18% Transformed 2% Protected
Schmidtsdrif Thornveld (SVk6)	Savanna	Eastern Kalahari Bushveld	Least Threatened 16% Target 13% Transformed 0.2% Protected
Highveld Alluvial Vegetation (AZa5)	N/A	Alluvial Vegetation/ Inland Azonal Vegetation	Least Threatened 31% Target >25% Transformed 10% Protected

4.1.2 Thorny Camphor bushveld

The entirety of the application area is comprised of the same vegetation type with only a slight variation. The vegetation type is that of a very dense thorny bushveld with the most dominant species being Tarconanthus camphoratus. The entirety of the vegetation unit is also dominated by short (no taller than 2m) thorny bushes and trees (Vachellia karoo, Vachellia tortilis, Senegalia mellifera, Mellifera detinens, Grewia flava) Searsia lancea occurs very sporadically on the southern half of the application area. The graminoids that dominate the vegetation unit include Themeda triandra, Eragrostis rigidior, Eragrostis lehmanniana, Heteropogon contortus, Aristida congesta, Cynodon dactylon, Digitaria eriantha, Stipagrostis ciliata, Cenchrus ciliaris, and Cymbopogon pospischilii. The woody vegetation cover becomes gradually less dense towards the river on the southern side of the application area. The application area is split into two portions (RE and Portion 1 of Farm 102), with the RE (northern portion) presently being utilized as a game farm. This portion has a vegetation makeup similar to portion 1 (Southern portion), though the size and frequency of Vachellia tortilis and Vachellia karoo trees gradually increases on a south-north gradient. On the northern most part of the application area large trees (Searsia lancea, Vachellia karoo, and Vachellia tortilis occur quite frequently. It is also on this northernmost area that Vachellia erioloba occurs sporadically. On the northern portion (utilized as a game farm) the alien invasives Erigeron bonariensis, Conyza sp., and Bidens pilosa occur, though not densely and concentrated around the edges of roads. Tarconanthus camphoratus dominate the entirety of the vegetation unit. The DFFE screening tool flagged the rare dicotyledon Pentzia oppostifolia and Brachystelma dimorphum, as possibly occurring on site, and although the site presented suitable habitat for Pentzia oppostifolia this species was not identified during this site visit. This may be due to the season and this species may occur on site. Brachystelma dimorphum is unlikely to occur, as this species is known from a single locality in North-central Free-state province. The entirety of the application area also has similar soil qualities, with the soil being very sandy and very rocky.

Figure 15. A: Dense Thorny Camphor bush. B: Woody growth less dense. C: Vachellia erioloba

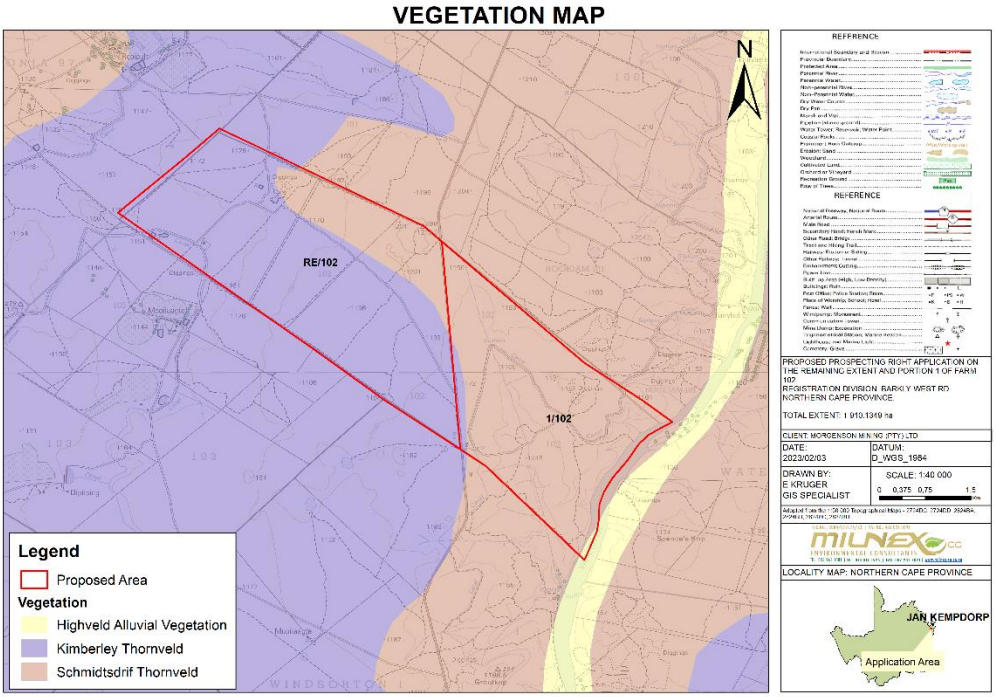

Figure 6: Vegetation Unit Map

PLANT SPECIES OBSERVED ON SITE

According to the DFFE Screening Report the Plant Species theme sensitivity of the proposed area falls mostly within Medium sensitivity and to a lesser extent Low sensitivity. Please see **Appendix 7** for the colour map.

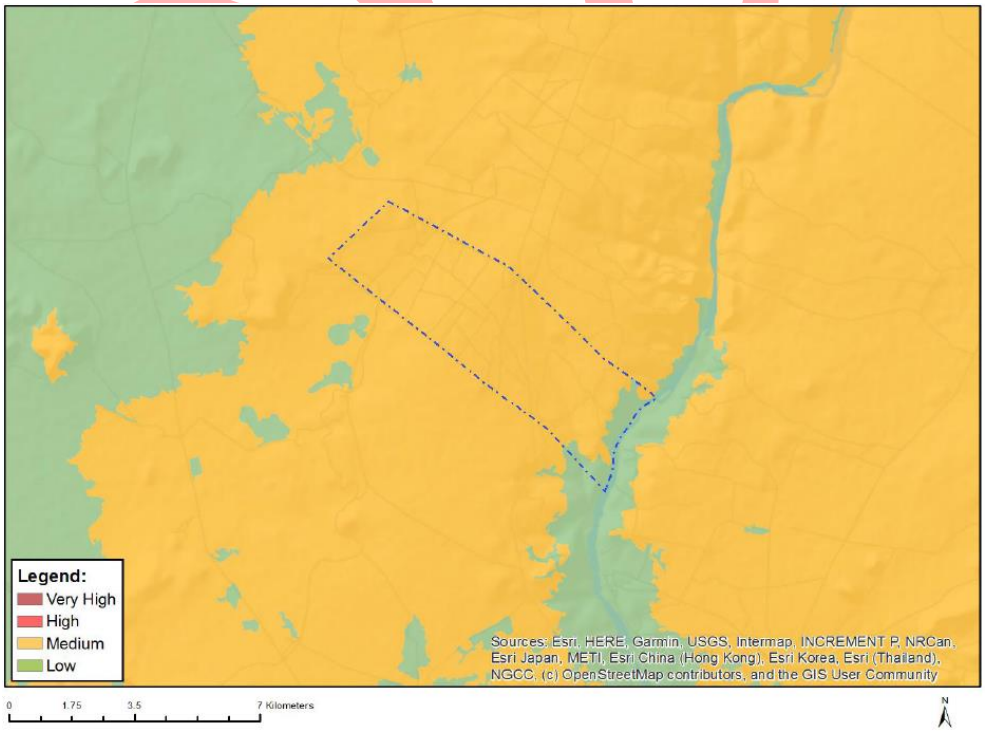

Figure 7: Plant Species Combined Sensitivity

Sensitive features according to the DFFE Screening report:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Sensitive species 257
Medium	Pentzia oppositifolia

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

4.2 Floral Assessment

Reliance was also made on desktop knowledge of the floral species occurring in the area (Table 9). A floral species list of the application area was compiled based on observations as well as observations of other similar sites within the same vegetation type as the application site. Species observed during the site visit are highlighted and the protection status of all species is indicated where relevant (Table 10). If a species is a known Alien and Invasive Species, this was also indicated.

4.2.2 Plant species observed on site.

Table 10: *Dominant terrestrial plant species of the application area. Species that were observed are highlighted.*

Plant species list			
Trees and Shrubs			
Scientific Name	**Common Name**	**Redlist Status**	**Invader category (NEMBA 2020)**
Asparagus burchellii	Wild asparagus	Least concern, endemic	
Aptosimum albomarginatum		Least concern	
Ehretia alba	Puzzle bush	Least concern	
**Eucalyptus camaldulensis*	River red gum	Exotic, declared invader	1b
Ficus cordata	Namaqua rock fig	Least concern	
Grewia flava	Velvet raisin	Least concern	
Hermannia affinis		Least concern	
Monechma incanum	Blouganna	Least concern	
Pentzia incana	Skaapkaroo	Least concern	
Ptycholobium biflorum,		Least concern	
Searsia lancea	Karree	Least concern	
Senegalia melifera detinens	Black thorn	Least concern	
Tarchonanthus camphoratus	Wild Camphor bush	Least concern	
[P]Vachellia erioloba	Camel thorn	**Protected**	
Vachellia karoo	Sweet thorn tree	Least concern	
Vachellia tortilis	Umbrella thorn	Least concern	
Ziziphus mucronata	Buffalo-thorn	Least concern	
Zygophyllum pubescens			
Graminoids			
Aristida congesta	Spreading Three-awn	Least concern	
Aristida diffusa	Iron Grass	Least concern	
Aristida meridionals	Gemsbokgras	Least concern	
Cenchrus ciliaris	Foxtail buffalo grass	Least concern	
Cymbopogon popischilii	Turpentine grass	Least concern	
Cynodon dactylon	Couch Grass	Least concern	
Digitaria eriantha	Finger grass	Least concern	
Enneapogon cenchroides	Nine-awned grass	Least concern	
Eragrostis lehmanniana	Lehmann's Love grass	Least concern	
Eragrostis rigidior	Curly leaf (Broad)	Least concern	
Fingerhuthia africana	Thimble grass	Least concern	
Heteropogon contortus	Spear grass	Least concern	
Hyparrhenia hirta	Thatching grass	Least concern	

Melinis repens	Natal red top	Least concern	
Panicum coloratum	Small buffalo grass	Least concern	
Setaria verticillata	Hooked bristlegrass	Least concern	
Stipagrostis ciliata	Bushman grass	Least concern	
Themeda triandra	Red grass	Least concern	
Forbes			
**Argemone ochroleuca*	Mexican poppy	Exotic, declared invader	1b
Barleria rigida	Scorpion thistle	Least concern	
**Bidens pilosa*	Blackjack	Exotic	
**Datura stramonium*	Common Thorn Apple	Exotic, declared invader	1b
#*Erigeron bonariensis*	Horseweed	Naturalized exotic weed	
**Opuntia ficus-indica*	Sweet prickly pear	Exotic, declared invader	1b
**Verbena bonariensis*	Tall verbena	Exotic, declared invader	1b
#*Tagetes minuta*	Khakibos	Naturalized exotic weed	
Herbs			
Alternanthera sessilis	Brazilian spinach	Least concern	
Barleria macrostegia	Tongklapper	Least concern	
**Cirsium vulgare*	Spear thistle	Exotic, declared invader	1b
Nidorella resedifolia	Stinkkruid	Least concern	
**Solanum elaeagnifolium*	Silver-leave bitter apple	Exotic, declared invader	1b
Succulent Herbs			
**Cylindropuntia imbricata*	Candelabrum cactus	Exotic, declared invader	1b
Salsola alabrescens	Brakbos	Least concern	
Creepers			
Gomphrena serrata	Prostate gomphrena	Exotic	

P - Protected Species

* - Alien and Invasive Species

- Naturalized exotic weeds (Not assessed for National Red List)

LAND CAPABILITY AND AGRICULTURAL POTENTIAL

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 5 (refer to Land capability map on **figure 8** and attached as **Appendix 5**).

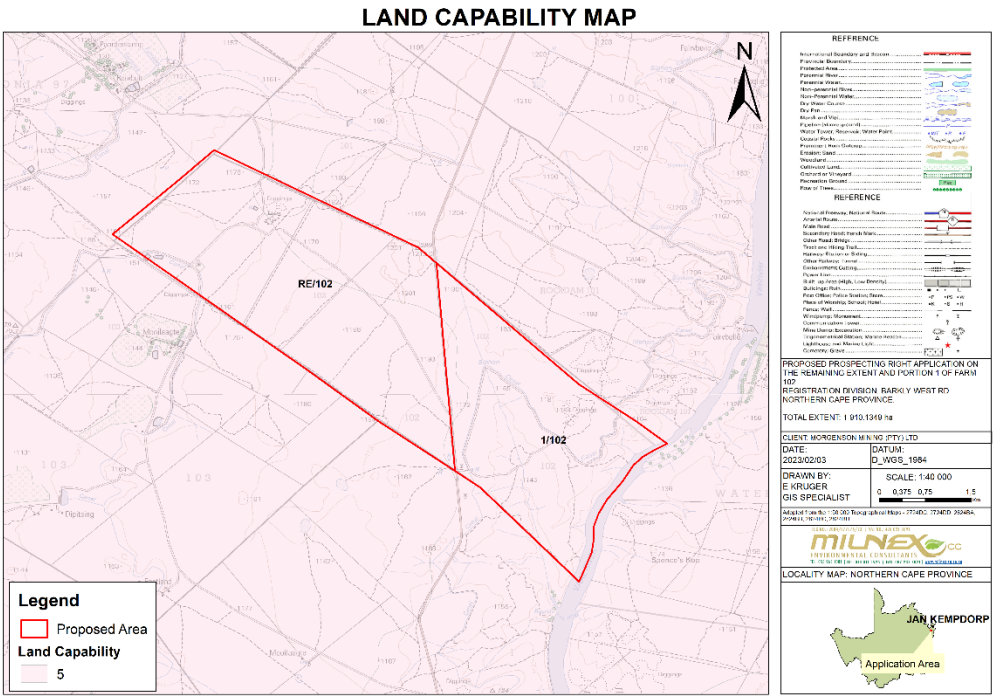

Figure 8: Land capability

According to the DFFE Screening Report the Agriculture theme sensitivity of the proposed area fall within Low and Medium sensitivity.

Please see **Appendix 7** for the colour map.

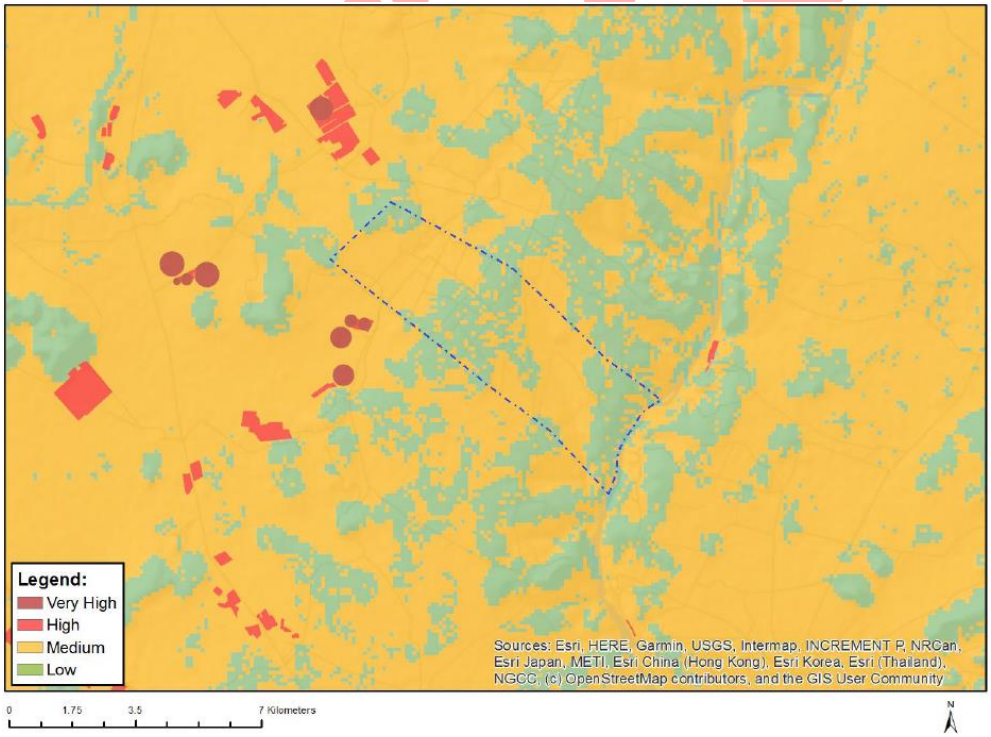

Figure 9: Agriculture Combined Sensitivity

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.

The proposed area does not fall within a threatened ecosystem according to **Figure 10**.

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

According to data sourced from South African National Biodiversity Institute (SANBI), the proposed site is not located within any Threatened Ecosystems, though there are some Priority Focus Area just South and downstream of the application area.

PROTECTED AREAS

According to the data for protected areas (**Figure 10**), the proposed area does not fall withing a protected area.

PROTECTED AREAS MAP

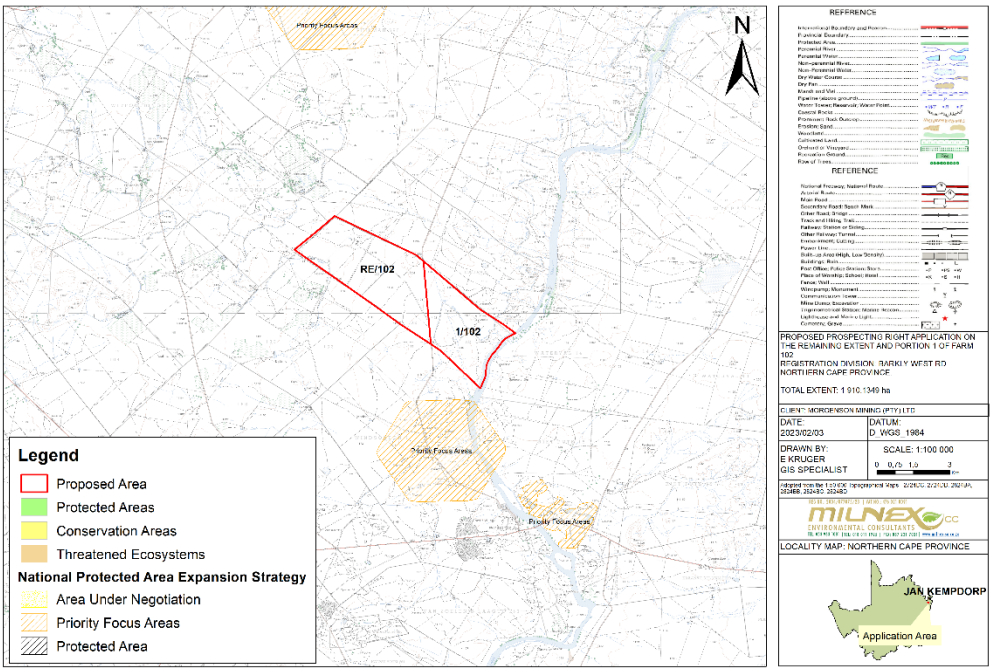

Figure10: Threatened and Protected Areas Map

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

Formally protected areas are protected either by national or provincial legislation. Based on the SAPAD (2022) Protected Areas Map, and the Northern Cape Biodiversity sector plan and map (2015), the study site does not overlap with any formally Protected Areas (Figure 9).

The National Protected Area Expansion Strategy (NPAES) sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion. According to the National Protected Area Expansion Strategy (2018), the project area does not overlap with any Priority Focus areas for conservation, though is located just North of some of the aforementioned areas (Figure 9).

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 (**Figure 9**), the proposed area falls mostly within Other Natural Areas, Ecological Support Area and a very small area within Critical Biodiversity Area One.

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

Based on the desktop information (Figure 10), the study area overlaps with a ESA 1 area, borders a CBA 1 area, and is mostly comprised of other natural areas. According to a matrix of recommended land use zones and associated activities in relation to the CBA map categories (READ, 2015 and MPTA, 2014), prospecting is not permitted, and actively discouraged in CBA 1 and CBA 2 areas. In ESA areas, prospecting is restricted to compulsory, site specific conditions and controls. When these conditions are unavoidable, prospecting is not permitted. Due to the prospecting method proposed in the PWP, and the scale of the operations, the proposed activities are categorised as open-cast mining and therefore actively discouraged in CBA 1, CBA 2, ESA 1, ESA 2, and other natural areas.

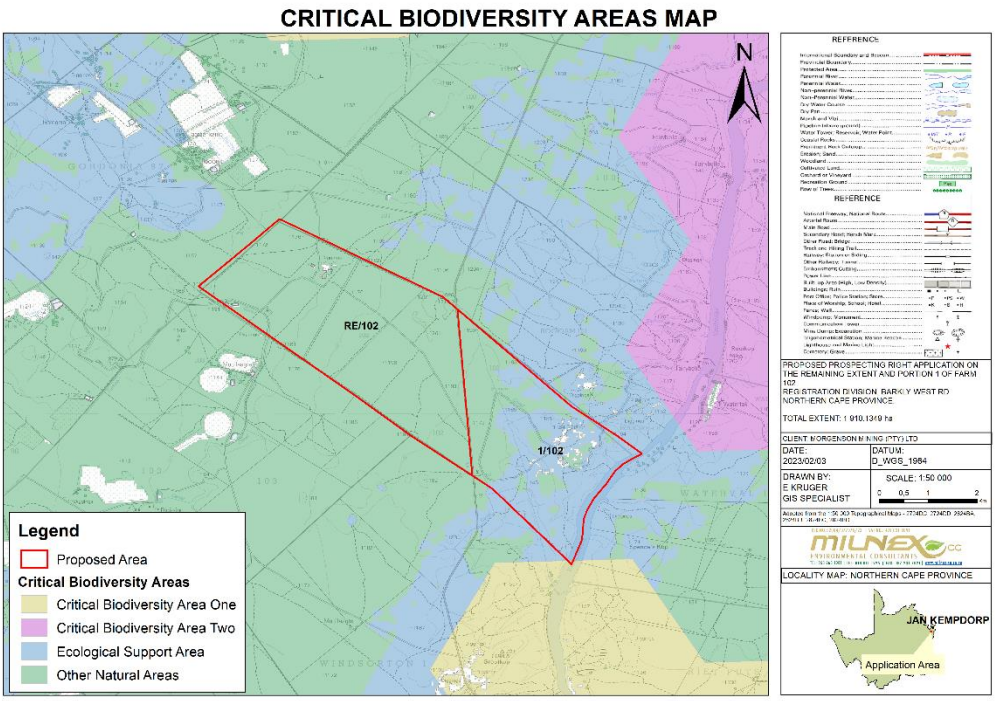

Figure 11: Critical Biodiversity Areas Map.

FAUNAL ASSESSMENT

According to the DFFE Screening Report the proposed area falls mostly within Low Terrestrial Biodiversity theme sensitivity and to a lesser extent Very High sensitivity. Please see **Appendix 7** for the colour map.

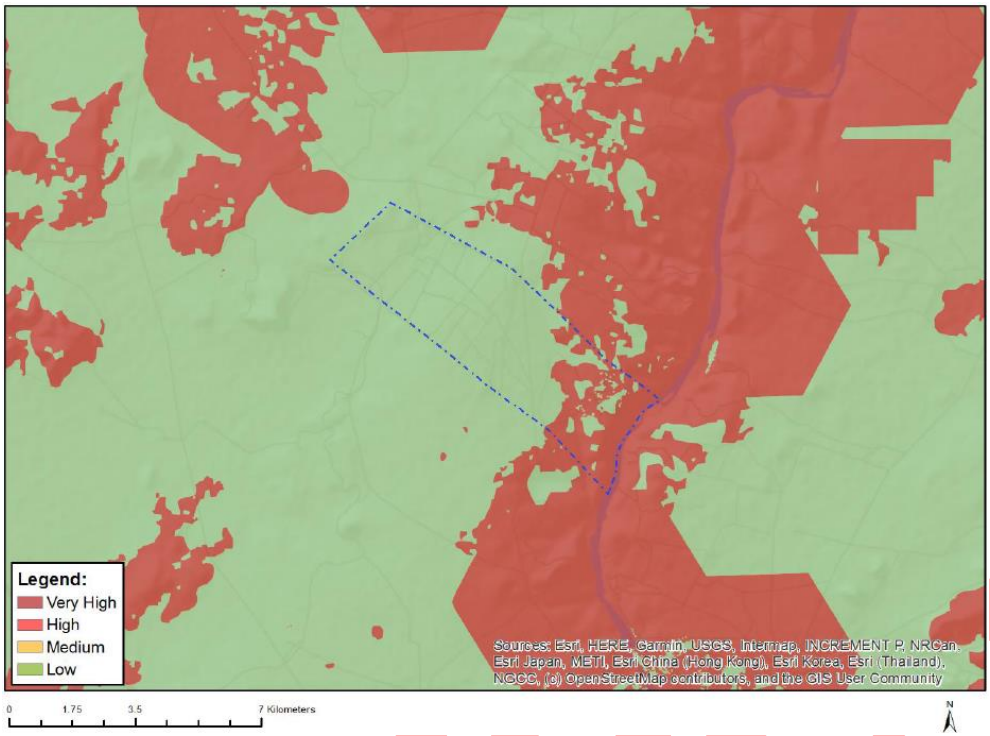

Figure 12: Terrestrial Biodiversity Combined Sensitivity

Sensitive features according to the DFFE Screening Report:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	Critical biodiveristy area 1
Very High	Ecological support area

According to the DFFE Screening Report the proposed area falls mostly within Medium and Low Animal Species theme sensitivity and to a lesser extent High sensitivity. Please see **Appendix 7** for the colour map.

Sensitive features according to the DFFE Screening Report:

Sensitivity	Feature(s)
High	Aves-Hydroprogne caspia
Low	Subject to confirmation
Medium	Aves-Neotis ludwigii
Medium	Aves-Sagittarius serpentarius

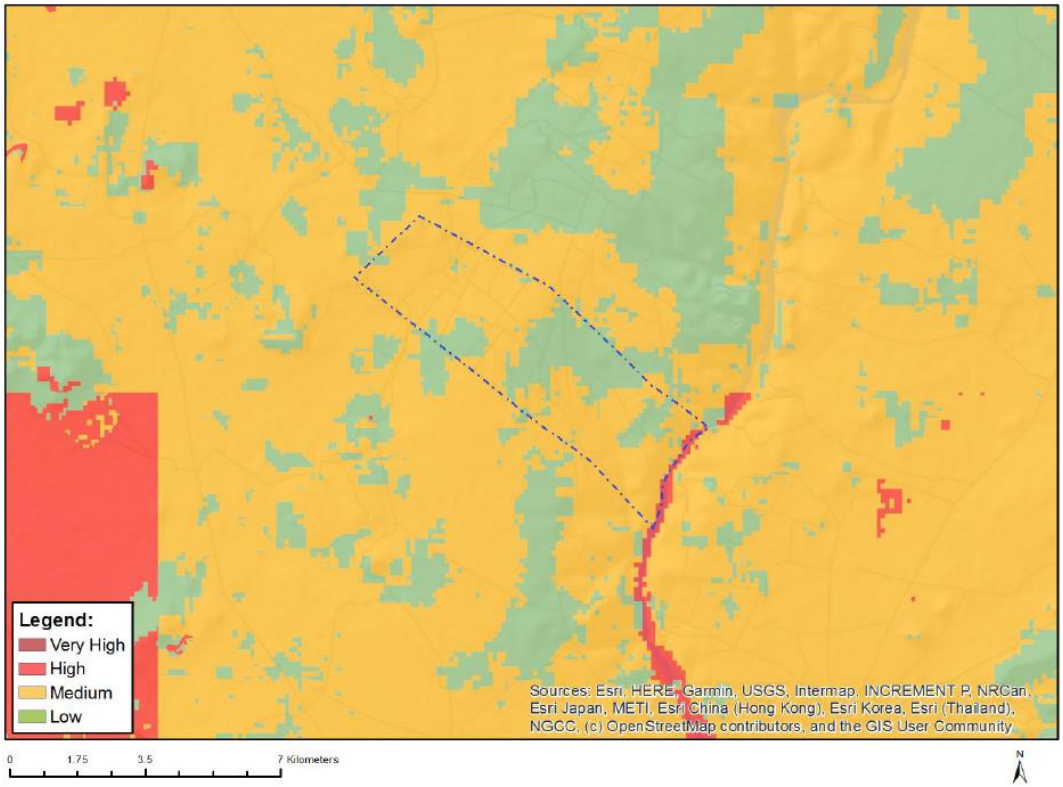

Figure 13: Animal Species theme sensitivity

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

4.3.2 Mammals

Table 12 below lists the mammal species of conservation concern 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). Species whose presence on the application site was confirmed by the specialist, as well as the species indicated as occurring on site by anecdotal evidence (observations by the landowners), are also included in Table 12 (highlighted in green). Mammals of which evidence was found by the specialist (tracks, droppings) include Steenbok, Kudu, and Warthog. Chacma baboons were observed on the other side of the Vaal river on the southern border of the application area, whilst their droppings were found on the side of the site, suggesting they cross the river (landowner confirmed this theory based on observations). The landowner operating on Portion 1 of the application area (southern Portion) attests to observing and identifying Yellow mongoose, Black tailed mongoose, Water mongoose, Southern African hedgehog, Bat-eared fox, Common duiker, Kudu, Vervet monkeys, Cape porcupine, Warthog, Elephant shrew, Smith's red rock hare, Rock hyrax, Ground squirrels, Caracal, Spotted necked otter and African clawless otter (in the river), and Black backed jackal on the application area. The landowner operating on the RE of the application area (northern portion), identified the same species as occurring on this portion, though with the exclusion of the two otter species as well as Vervet monkeys, and with the inclusion of Small-spotted genet, Aardvark, Aardwolf, and Pangolin. Game on this portion include Eland, Gemsbok, Waterbuck, Red hartebeest, Springbuck, Impala, Zebra, Blue wildebeest, Kudu, and Sable.

Though only the presence of the aforementioned game animals could be confirmed by the specialist, the recorded sightings of Aardwolf, Aardvark, Spotted-necked otter (African clawless otter), African clawless otter (near Threatened), Bat-eared fox, Southern African hedgehog, and Temminck's Pangolin (Vulnerable) are significant, as all of these species are Schedule 1 Specially Protected Species in the Northern Cape (NCNC, 2009). There is suitable habitat for all of the aforementioned species on the application area, and the accounts of the landowner do suggest a high degree of certainty as to the identity of these species.

Table 12: Mammal SCC and mammal species potentially occurring and confirmed to occur on site (IUCN, 2023)

Genus	Species	Common name	IUCN and SA Redlist status	ToPS	Likelihood of occurence
Acinonyx	***jubatus***	**Cheetah**	**Vulnerable**	**Schedule 1**	**Unlikely**

Aepyceros	*melampus*	Impala	Least concern	S2	Possible
Alcelaphus	*buselaphus*	Red hartebeest	Least concern	S2	Possible
Antidorcas	*marsupialis*	Springbuck	Least concern	S2	Possible
Aonyx	***capensis***	**African clawless otter**	**Near Threatened**	S2	**Possible**
Atelerix	*frontalis*	Southern African hedgehog	Least concern	S2	Possible
Atilax	*paludinosus*	Water mongoose	Least concern	S2	Possible
Bdeogale	*nigripes*	Black-tailed mongoose	Least concern	S2	Possible
Canis	*mesomelas*	Black backed jackal	Least concern	S2	Possible
Caracal	*caracal*	Caracal	Least concern	S2	Possible
Ceratotherium	***simum***	**White rhinoceros**	**Near Threatened**	S2	**Unlikely**
Chlorocebus	*pygerythrus*	Vervet monkey	Least concern	S2	Possible
Connochaetes	*taurinus*	Blue wildebeest	Least concern	S2	Possible
Cynictis	*penicillata*	Yellow mongoose	Least concern	S2	Possible
Diceros	***bicornis***	**Black rhinoceros**	**Critically Endangered**		**Unlikely**
Eidolon	***helvum***	**Straw-coloured fruit bat**	**Near Threatened**	S2	**Possible**
Elephantulus sp.		Elephant shrew	Least concern	S2	Possible
Equus	***quagga***	**Plains zebra**	**Near Threatened**	S2	**Unlikely**
Equus	*quagga boehmi*	Hartmans Zebra	Least concern	**S1**	Possible
Felis	***nigripes***	**Black-footed cat**	**Vulnerable**	**S1**	**Possible**
Genetta	*genetta*	Small-spotted genet	Least concern	S2	Possible
Hippotragus	*niger*	Sable	Least concern	S2	Possible
Hydrictis	***maculicollis***	**Spotted-necked otter**	**Near Threatened**	S2	**Possible**
Hystrix	*africaeaustralis*	Cape porcupine	Least concern	S2	Possible
Kobus	*ellipsiprymnus*	Waterbuck	Least concern	S2	Possible
Mystromys	***albicaudatus***	**White-tailed rat**	**Vulnerable**	S2	**Possible**
Orycteropus	*afer*	Aardvark	Least concern	**S1**	Possible
Oryx	*gazella*	Gemsbok	Least concern	S2	Possible
Otocyon	*megalotis*	Bat-eared fox	Least concern	**S1**	Possible
Panthera	***pardus***	**Leopard**	**Vulnerable**	S2	**Possible**
Papio	*ursinus*	Chacma baboon	Least concern	S2	Possible
Parahyaena	***brunnea***	**Brown hyaena**	**Near Threatened**	S2	**Possible**
Pedetes	*capensis*	Springhare	Least concern	S2	Possible
Phacochoerus	*africanus*	Warthog	Least concern	S2	Possible
Procavia	*capensis*	Rock hyrax	Least concern	S2	Possible
Pronolagus	*rupestris*	Smith's red rock hare	Least concern	S2	Possible
Proteles	*cristata*	Aardwolf	Least concern	**S1**	Possible
Raphicerus	*campestris*	Steenbok	Least concern	S2	Possible
Smutsia	***temminckii***	**Temminck's Pangolin**	**Vulnerable**	**S1**	**Possible**
Sylvicapra	*grimmia*	Common duiker	Least concern	S2	Possible
Syncerus	***caffer***	**African buffalo**	**Near Threatened**	S2	**Possible**
Taurotragus	*oryx*	Eland	Least concern	S2	Possible
Tragelaphus	*strepsiceros*	Kudu	Least concern	S2	Possible
Xerus	*inauris*	Ground squirrel	Least concern	S2	Possible

4.3.3 Herpetofauna

The local occurrences of reptiles and amphibians (collectively known as Herpetofauna) are closely dependent on broadly defined habitat types, terrestrial, arboreal (tree-living), rupicolous (rock dwelling) and wetland-associated vegetation cover. Based on the DFFE Screening tool, no Herpetofauna SCC are expected to occur on site. A list of expected species for the study site (Table 11) was created using data from the IUCN (2023). No reptile or amphibian species were encountered during the site visit, possibly due to the lower level of herpetofauna activity during the winter months, but there is undoubtedly a variety of reptile and amphibian species that should occur on the application area, especially in and near the wetland areas. Anecdotal evidence (sightings by landowners) suggests the presence of Cape cobra, Night adder, Puffadder, Mole snake, Boomslang, and Leopard tortoise on the application area. None of the species expected to occur are species of conservation concern, nor are any threatened or protected species. This does not, however, mean that herpetofauna species of conservation concern or threatened or endangered species never occur on site, and their presence on the application area may be confirmed in the future.

Table 1: List of Herpetofauna Possibly Occurring on site (IUCN, 2023)

Genus	species	Common name	IUCN status
Amphibians			
Schismaderma	*carens*	African Red Toad	LC
Sclerophrys	*capensis*	Raucous Toad	LC
Sclerophrys	*garmani*	Eastern Olive Toad	LC
Sclerophrys	*gutturalis*	Gutteral Toad	LC
Sclerophrys	*poweri*	Western olive Toad	LC
Kassina	*senegalensis*	Bubbling Kassina	LC
Phrynobatrachus	*natalensis*	Snoring Puddle Frog	LC
Xenopus	*laevis*	Common Platanna	LC
Amietia	*delalandii*	Delalande's River Frog	LC
Cacosternum	*boettgeri*	Boettger's Caco	LC
Pyxicephalus	*adspersus*	African Bullfrog	LC
Tomopterna	*cryptotis*	Cryptic Sand Frog	LC
Tomopterna	*natalensis*	Natal Sand Frog	LC
Tomopterna	*tandyi*	Tandy's Sand Frog	LC
Lizards			
Agama	*aculeata*	Common Ground Agama	LC
Agama	*atra*	Southern Rock Agama	LC
Dalophia	*pistillum*	Blunt-tailed Worm Lizard	LC
Monopeltis	*capensis*	Cape Spade-snouted Worm Lizard	LC
Monopeltis	*infuscata*	Dusky Spade-snouted Worm Lizard	LC
Zygaspis	*quadrifrons*	Kalahari Dwarf Worm Lizard	LC
Karusasaurus	*polyzonus*	Karoo Girdled Lizard	LC
Chondrodactylus	*bibronii*	Bibron's Tubercled Gecko	LC
Lygodactylus	*capensis*	Cape Dwarf Gecko	LC
Pachydactylus	*capensis*	Cape Thick-toed Gecko	LC
Ptenopus	*garrulus*	Common Barking Gecko	LC
Gerrhosaurus	*flavigularis*	Yellow-throated Plated Lizard	LC
Meroles	*squamulosus*	Common Desert Lizard	LC
Nucras	*holubi*	Holub's Sandveld Lizard	LC
Nucras	*intertexta*	Spotted Sandveld Lizard	LC
Pedioplanis	*lineoocellata*	Spotted Sand Lizard	LC
Pedioplanis	*namaquensis*	Namaqua Sand Lizard	LC
Acontias	*gracilicauda*	Thin-tailed Legless Skink	LC

Acontias	*occidentalis*	Western Legless Skink	LC
Panaspis	*wahlbergii*	Angolan Snake-eyed Skink	LC
Trachylepis	*capensis*	Cape Skink	LC
Trachylepis	*punctatissima*	Speckled Rock Skink	LC
Trachylepis	*punctulata*	Speckled Sand Skink	LC
Trachylepis	*sulcata*	Western Rock Skink	LC
Trachylepis	*varia*	Eastern Variable Skink	LC
Varanus	*albigularis*	White-throated Monitor	LC
Varanus	*niloticus*	Nile Monitor	LC
Snakes			
Aparallactus	*capensis*	Black-headed Centipede-eater	LC
Atractaspis	*bibronii*	Bibron's Stiletto Snake	LC
Atractaspis	*duerdeni*	Duerden's Stiletto Snake	LC
Xenocalamus	*bicolor*	Bicoloured Quill-snouted Snake	LC
Causus	*rhombeatus*	Rhombic night adder	LC
Chamaeleo	*dilepis*	Flap-necked Chameleon	LC
Crotaphopeltis	*hotamboeia*	Herald Snake	LC
Dasypeltis	*scabra*	Rhombic Egg Eater	LC
Dispholidus	*typus*	Boomslang	LC
Philothamnus	*semivariegatus*	Spotted Bush Snake	LC
Elapsoidea	*sundevallii*	Sundevall's Garter Snake	LC
Naja	*nivea*	Cape Cobra	LC
Boaedon	*capensis*	Brown House Snake	LC
Lycophidion	*capense*	Cape Wolf Snake	LC
Leptotyphlops	*scutifrons*	Peter's Thread Snake	LC
Prosymna	*bivittata*	Two-striped Shovel-snout	LC
Prosymna	*sundevallii*	Sundevall's Shovel-snout	LC
Psammophis	*brevirostris*	Short-snouted Grass Snake	LC
Psammophis	*leightoni*	Cape Sand Snake	LC
Psammophylax	*tritaeniatus*	Striped Skaapsteker	LC
Pseudaspis	*cana*	Mole Snake	LC
Indotyphlops	*braminus*	Brahminy Blind Snake	LC
Rhinotyphlops	*lalandei*	Delalande's Beaked Blind Snake	LC
Bitis	*arietans*	Puff Adder	LC
Shelled Reptiles			
Pelomedusa	*galeata*	South African Helmeted Terrapin	LC
Homopus	*femoralis*	Greater Padloper	LC
Stigmochelys	*pardalis*	Leopard Tortoise	LC

Based on the DFFE Screening tool, the central part of the application area presents a Medium sensitivity for Animal Species, with Neotis ludwigii, Sagittarius serpentarius, and Hydroprogne caspia as potentially occurring on site. Based on anecdotal evidence, the presence of Sagittarius serpentarius is confirmed on the application area. Due to the presence of multiple mammalian and avifaunal SCC mentioned in section 4.3.1 and 4.3.2 occurring on site the application area, the site presents a Very High sensitivity for the Animal theme. Steps should be taken to ensure that the presence of all SCC are taken into account both during implementation as well as mitigation measures for the proposed activities on this application area. Due to the migratory behaviour of certain organisms, and tolerance to disturbed habitat, some other species of conservation concern may sporadically be seen in the study area.

According to the DFFE Screening Report the proposed area mostly falls within Low Aquatic Biodiversity Theme Sensitivity and the area adjacent the Vaal River falls in very High sensitivity. Please see **Appendix 7** for the colour map.

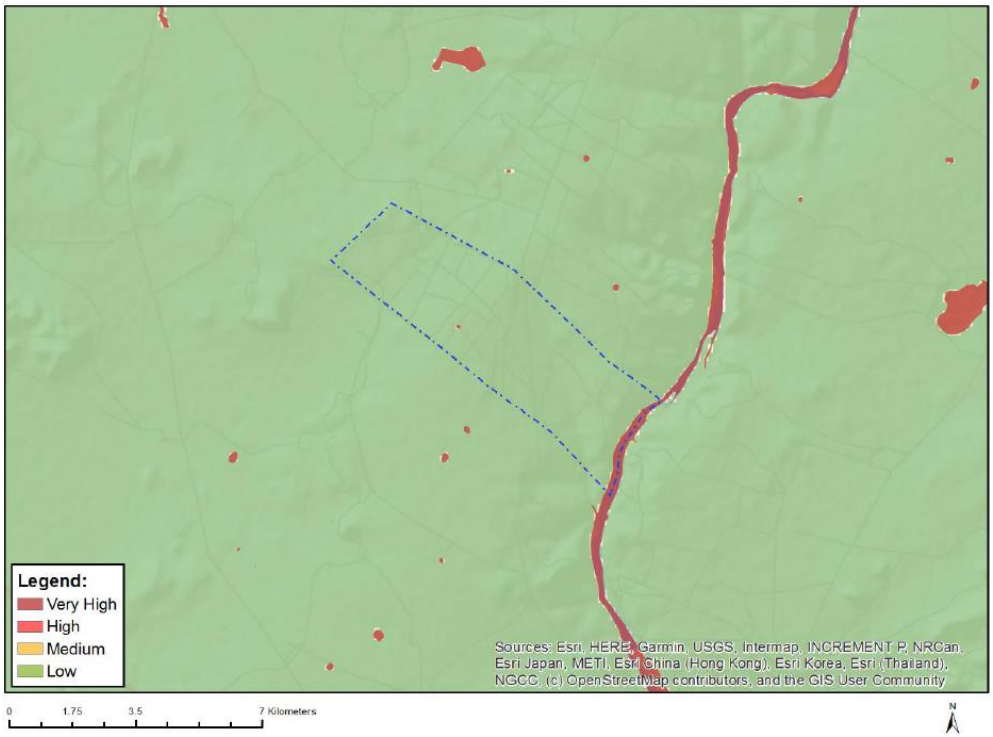

Figure 14: Aquatic Biodiversity Combined Sensitivity

Sensitive features according to the DFFE Screening Report:

Sensitivity	Feature(s)
Low	Low sensitivity
Very High	Wetlands and Estuaries

BIODIVERSITY PRIORITY AREAS FOR MINING

According to the Mining and Biodiversity Guidelines (2013), biodiversity priority areas sensitive to the impacts of mining are divided into four categories (Table below). The purpose is to identify and categorise biodiversity priority areas sensitive to the impacts of mining, to support mainstreaming of biodiversity issues in decision making in the mining sector.

Table: Four categories of biodiversity priority areas

Category	Description
A	Legally protected
B	Highest biodiversity importance
C	High biodiversity importance
D	Moderate biodiversity importance

Based on **Figure 15,** the area does not overlap with any Category.

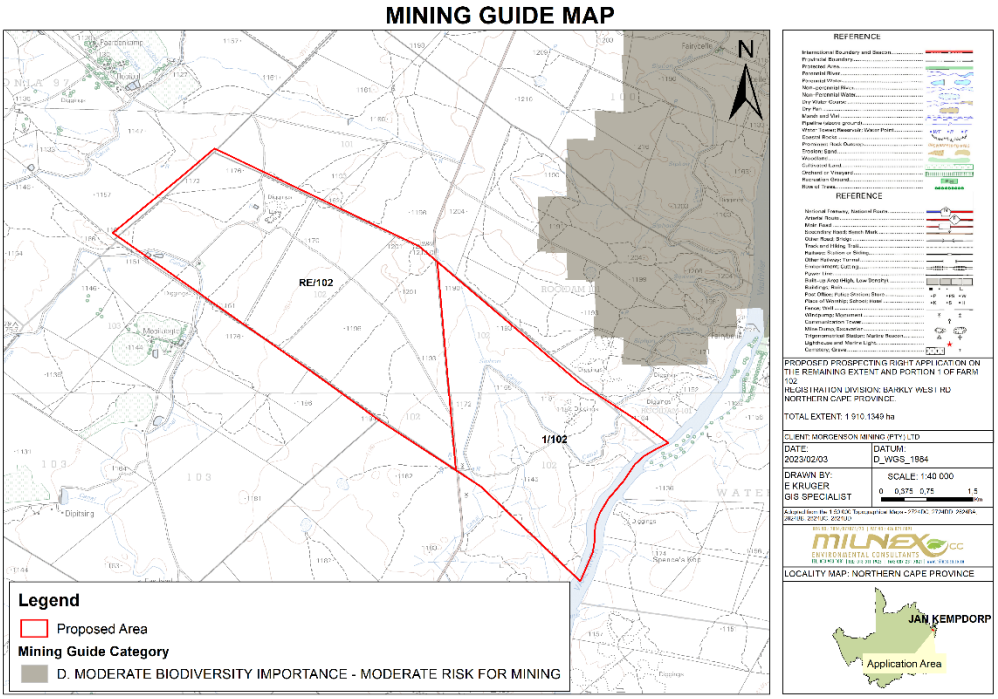

Figure 15: Biodiversity priority areas, in accordance with the Mining of Biodiversity Guidelines, associated with the study site.

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

According to the mine guide map (Figure 11); the proposed area does not overlap with any areas of biodiversity importance or sensitivity for mining. The application area is located roughly 1km South and downstream of a Category D: Moderate biodiversity importance.

The study site falls within Southern Kalahari Ecoregion according to Kleynhans et al. (2005), a level 1 River Ecoregion classification System for South Africa, Lesotho, and Swaziland. Ecological regions (Ecoregions) are regions within which there is relative similarity in the mosaic of ecosystems and ecosystem components (biotic and abiotic, aquatic, and terrestrial) (Kleynhans et al., 2005). The topography of the Southern Kalahari Ecoregion is represented by plains with low to moderate relief in the east, and open hills, lowlands, and mountains with moderate to high relief in the west. The western part of the region consists of dune hills. The lower part of the Vaal River flows through the region, while others such as the Harts, Molopo, Kuruman and Nosob are seasonal.

Table 8: Attributes of the Southern Kalahari (29) Ecoregion (Kleynhans et al. 2005)

Ecoregion Characteristics	
Terrain Morphology: Broad division (Dominant types in bold) (Secondary)	***Plains; Low Relief;*** *Plains Moderate Relief; Lowlands; Hills and Mountains; Moderate and High Relief (limited)* ***Open Hills, Lowlands; Mountains; Moderate to High Relief;*** *Closed Hills; Mountains; Moderate and High Relief*
Vegetation types (dominant types in bold) (Primary)	*Orange River Nama Karoo (limited); Karroid Kalahari Bushveld;* ***Shrubby Kalahari Dune Bushveld;*** *Thorny Kalahari Dune Bushveld (limited);Kalahari Mountain Bushveld;* ***Kalahari Plains Thorn Bushveld;*** *Kalahari Plateau Bushveld;* ***Kimberley Thorn Bushveld***
Altitude (m a.m.s.l)	*500-1700; 1700-1900 limited*
MAP (mm)	*0 to 500*

Coefficient of Variation (% of annual precipitation)	*30 to >40*
Rainfall concentration index	*50 to >65*
Rainfall seasonality	*Mid to very late summer*
Mean annual temp. (°C)	*14 to 22*
Mean daily max. temp. (°C): February	*28 to >32*
Mean daily max. temp. (°C): July	*14 to 22*
Mean daily min. temp. (°C): February	*14 to 20*
Mean daily min temp. (°C): July	*-2 to 4*
Median annual simulated runoff (mm) for quaternary catchment	*<5 to 60*

QUATERNARY CATCHMENTS AND ASSOCIATED WATERCOURSES

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

The study site falls within the C33B, C33C, and C91D Quaternary Catchments, and forms part of the Lower Vaal WMA. The Lower Vaal WMA covers a total catchment area of 134 125 km2, with its major rivers being the Harts, Molopo, and the Vaal.

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).

The National Freshwater Ecosystem Priority Areas (NFEPA) project provides strategic spatial priorities for conserving South Africa's freshwater ecosystems and supports sustainable use of water resources. These priority areas are called Freshwater Ecosystem Priority Areas, or 'FEPAs'. These areas were identified based on representation of ecosystem types and flagship free-flowing rivers, maintenance of water supply areas in areas with high water yield, identification of connected ecosystems and, representation of threatened and near-threatened fish species and associated migration corridors (Nel et al., 2011).

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

wetland types vary tremendously from subtropical reed beds and tall swamp forests to arid salt pans, which all support unique and varied animal life.

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Figure 16 illustrates all wetland types associated with the study area. According to the Wetland areas map the Vaal River bordering the proposed area is a Channelled valley-bottom wetland. There are also Depressions and Seep wetlands on the proposed area.

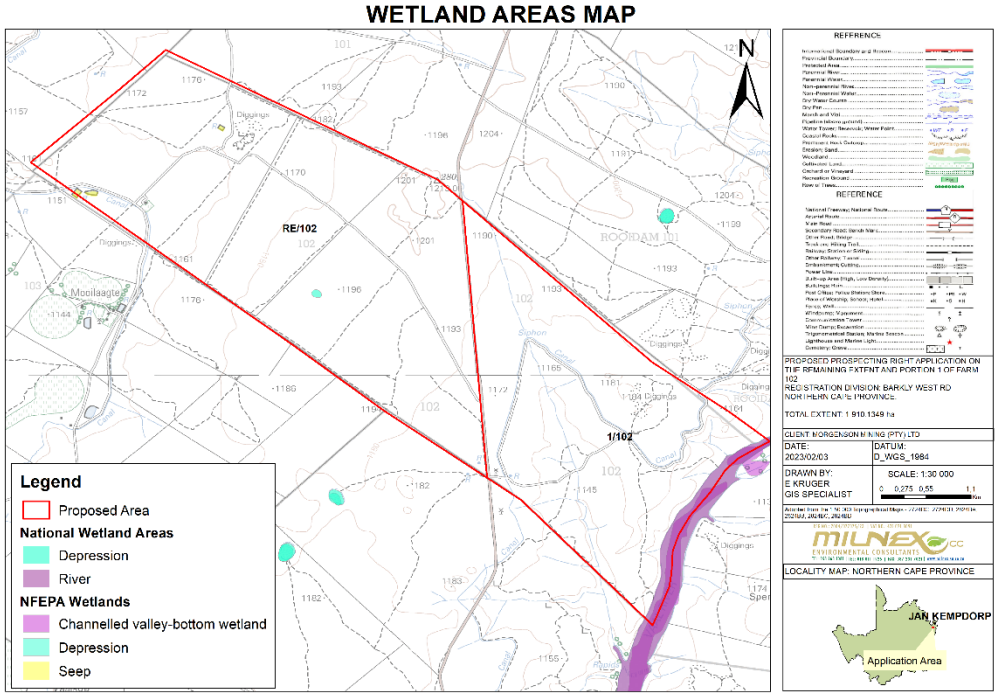


Figure 16: Wetland types located within or near the study site.

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

6.1 Wetland Habitat Description and System Characterisation

The wetland assessment was conducted on the 10th, 11th, and 12th of June 2023, which was within the dry season. A hand-held auger and GPS phone were used to log all information in the field.

From the desktop assessment, three (3) wetland types were expected to occur within and around the study area (Figure 18). These are a River, one Depression and some Seep wetlands. A site visit was conducted to confirm the desktop findings and are discussed below.

Four wetlands were assessed and delineated during the site visit. The site visit confirmed the assessed wetlands to be a Channelled valley bottom, a Floodplain wetland bordering the Vaal river, and two Depression wetlands. The CVB and FP are located on the Southern portion of the application area and are undisturbed by modern agricultural activities. Historically, cattle inhabited the portion that these wetlands are located in, though presently there is no evidence of disturbance by livestock. The assessment will aim to assess the state and importance of these wetlands, along with conserving them through consideration of the catchment area.

6.1.1 Artificial wetlands

Two segments of the Vaalharts channel (total length of roughly 6.77km) are located on the application area. The Vaalharts irrigation scheme is the largest irrigation scheme in South Africa and flows through 1176 km of canals, provide irrigation water to 39829 ha of scheduled land, industrial water to six towns as well as other industrial water users. The Channel originates near Warrenton the closest town to the application area.

Figure 19. Segment of the Vaalharts channel on the application area.

There is a tiny area on the Northwestern corner of the application area where water leaks from a culvert and sluice in the Vaalharts channel. The landowners pay for the use of this sluice and its associated water, though have not made use of the water for some time and the sluice has remained close. Historically this water flowed down a small dugout channel and was collected in a small dam constructed of berms (yellow non wetland area on Figure 18. Presently, only a narrow channel leading up to the dam presents surface water as well as hydrogeomorphic soil properties. The area is densely vegetated by trees (Tarconanthus camphoratus, Searsia lancea, Ziziphus mucronata, Vachellia karoo, Vachellia erioloba, Mellifera detinens) and similar graminoids as the rest of the application area. There are localized portions of Sedges (Cyperaceae), and the area is also relatively disturbed by the presence of Verbena bonariensis and Skraalhanse. The water flowing down this small dugout channel has infiltrated the soil over time and resulted in the presence of mottling within the sandy clay soil. Due to the unnatural nature of this wetland and the extremely small size of the area this wetland is not afforded the same assessment as the natural wetlands within the application area. Due to the extremely close proximity of this wetland to the Vaalharts channel it is also highly unlikely that it will be disturbed by the proposed prospecting activities.

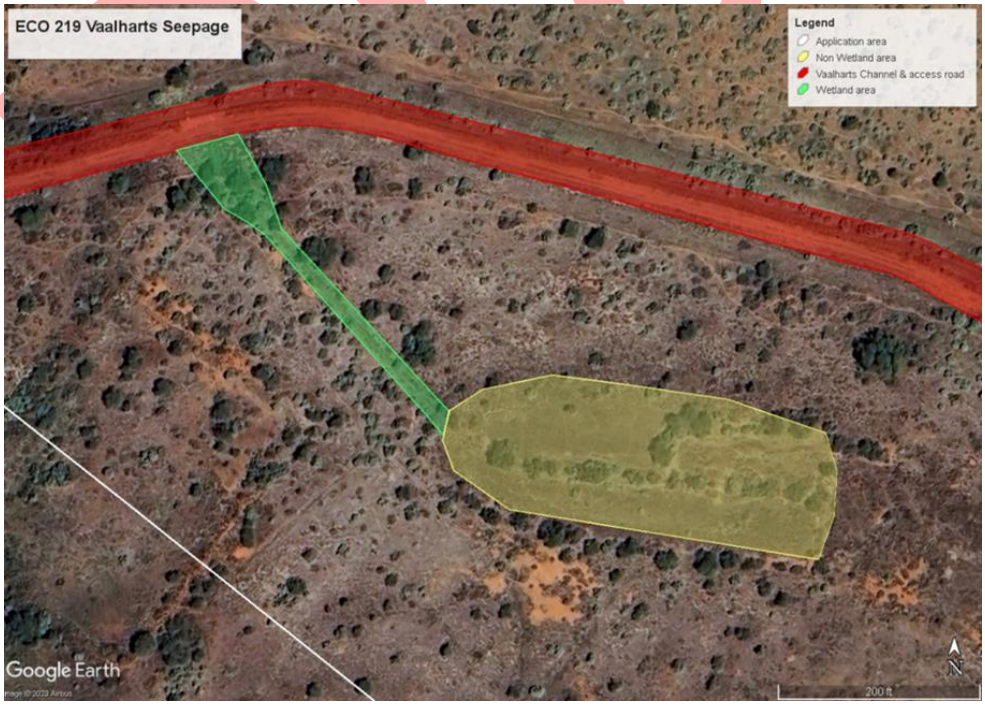


Figure 20. Small Seepage from the Vaalharts Channel

The last of the unnatural wetlands on the application area is small dam which is the result of water accumulating in the deepest pit of the area of historically mined land on the northeastern corner of the application area. The water here is a

few metres deep and supports a large variety of plants (mostly Typha capensis), as well as avifauna. The embankments are very steep, and the system is endoreic.

Figure 22. Dam within the mined area on the application area.

6.1.2 Channelled valley bottom (CVB)

The CVB is mostly unmodified and undisturbed and seems to start at the North-Eastern border of the application area and starts flowing downhill for roughly 1.46 km before it is transected by the Vaalharts channel. The depth of the channel of the CVB as well as the slope of its lateral catchment gradually increases as the CVB flows South, with the most level topography occurring at the Northern end and border of the application area, whilst at the southernmost portion the channel is deepest. The extent of open and flowing water also increases in a North-South gradient. On the southern part of the CVB there is a perennial supply of water flowing within the active channel of the CVB. The water is crystal clear and seems to be of good quality, with only a small amount of Hair algae present in some portions. The CVB is very densely vegetated by Sedges (Family Cyperaceae). In some areas the catchment flattens and widens and in one area the flow path winds/coils slightly along the topography. For the most part, the CVB flows in a straight line and maintains a single gradually widening active channel. Though the drainage lines flowing into the CVB are not characterized by wetland plants or soils, they are afforded the same buffer zone as the wetland portion of the CVB and should be protected in the same manner, as any disturbances within these areas will directly affect the CVB under heavy rainfall conditions. This CVB and its open water is essential for the fauna of this application area and supports a wide variety of birds such as Malachite Kingfisher (Corythornis cristatus). The soil of the wetland is saturated gleyic gray clay and a dry red sandy loam at the borders.

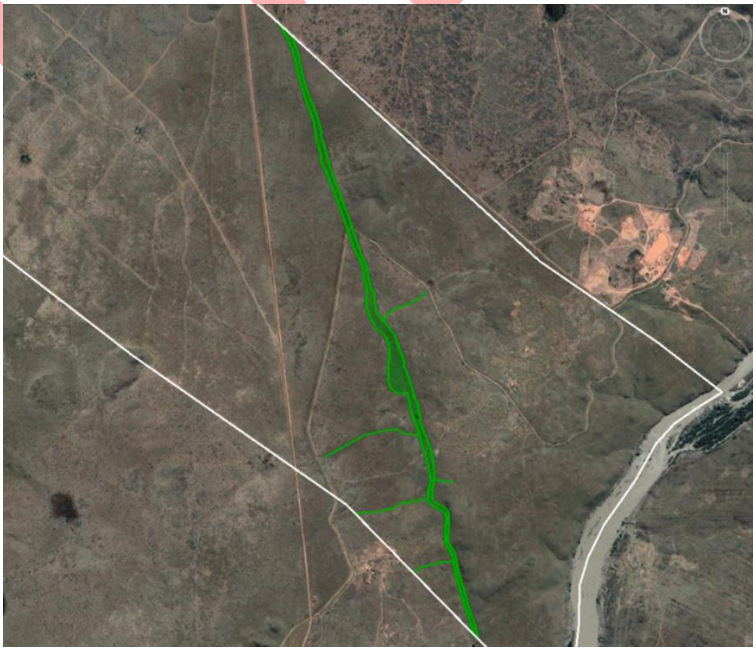


Figure 23: CVB and its associated drainage lines.

6.1.3 Floodplain (FP)

The largest and most extensive wetland on the study is a collection of Floodplain areas, at the Southern end of the application area, bordering the Vaal river. Though not the entire extent of this portion of the river on this application area is characterized by a floodplain wetland, large portions are, and as such the entire extent is delineated and characterized as a floodplain wetland. The topography of the banks of this portion is quite flat for roughly 30-50 metres before it steeply ascends into the rest of the application area. The FP is characterized by temporarily/ seasonally saturated soils and the vegetation cover is low and primarily composed of grasses. Vegetation of the wetland is limited to very short grass, sparse Sedges (Cyperaceae), dense Typhus capensis (in the water) and large trees (Eucalyptus camaldulensis, Searsia lancea, Ziziphus mucronata) growing in groves on the bank. Spoor of many animals (Kudu antelope, Warthog, Steenbok) were found within the wetland and a troupe of Baboons were seen on the opposite side, whilst a Fishing eagle circled overhead, highlighting the importance of this wetland for the fauna of this area. This wetland does not seem to be disturbed by anthropogenic activities at all. The drainage lines flowing down into this floodplain wetland are deep, steep, and mostly comprised of large red rocks, as the sand and soil surrounding these rocks have been weathered away resulting in the drainage lines. Though the drainage lines do not exhibit wetland soils or other characteristics, they are afforded the same buffer zones as the wetland portion of the FP.

Figure 25. Extent of the FP and its associated drainage lines.

6.1.4 Depression wetlands

There are two small Depression wetlands within the northern part of the application area. These depressions are dominated by temporarily/seasonally saturated soils and were dry at the time of the site visit (10th, 11th, 12th of July 2023). The depressions are heavily utilized by the stocks of game animals (Springbuck, Impala, Eland, etc.) that inhabit this portion of the application area, especially in the wet season when there is surface water present, as these depressions are some of the only sources of water on the application areas. Vegetation cover within the D1 is very low with little cover from grasses and forbs, and there are no wetland plants present in either of the Depressions. The soil of the wetlands is very stony and consists of dry red sand, with loamier and more clay-like mottled soils at the lowest areas. At the edge of Depression 1 there is a small dam built to retain water for year-round use by the animals of the application area. Disturbances in these wetlands are limited to slight geomorphic (some low berms are present in D1) and some vegetation disturbances. The soil within D2 is much drier than D1 (dry sand), though at the lowest point of D2 there are some mottles present.

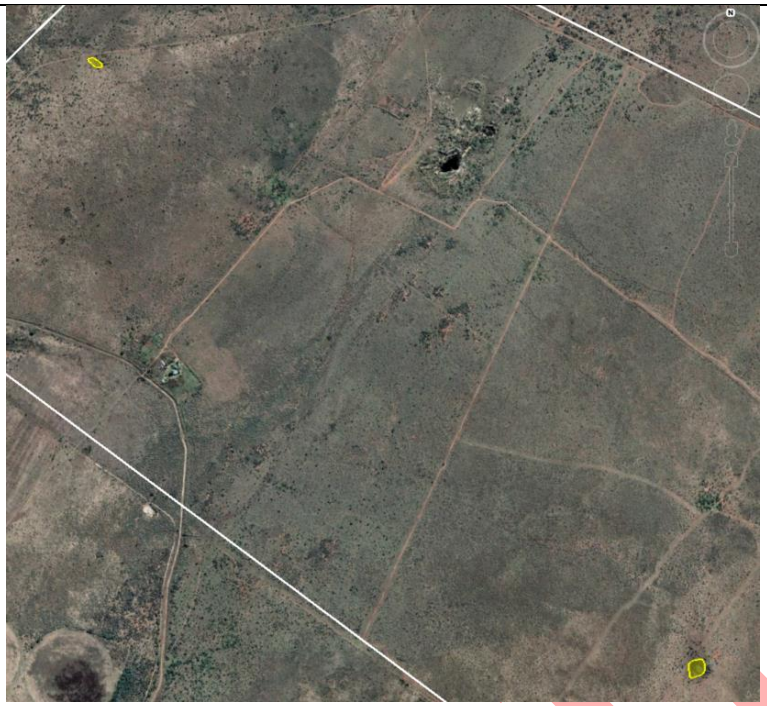


Figure 27: Depression wetlands of the appplication area

6.2 Wetland Habitat and System Characterisation

6.2.1 Assessment of the wetlands and Riparian areas

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 farming, prospecting, drought, erosion and clearing of natural vegetation within the greater catchment were taken into consideration during the assessment.

Feature	***CVB***	***FP***	***D1***	***D2***
Catchment Features and Current Impacts	*Water supplied by rainfall and runoff within the wetland, as well as drainage lines and associated catchments*	*Water supplied by rainfall and runoff within the wetland, as well as drainage lines and associated catchments and upstream of the river*	*Endorheic. Water drains from the catchment to the lowest part of the system where it infiltrates the soil*	*Endorheic. Water drains from the catchment to the lowest part of the system where it infiltrates the soil*
Wetland Type	*CVB*	*FP*	*Depression*	*Depression*
Downstream Features	*Wetland flows into the Vaal river*	*Wetland is adjacent to and contributes to the Vaal river.*	*System is endorheic.*	*System is endorheic.*
Vegetation Characteristics	*Vegetation mentioned under CVB in* ***Section 6.1.1***	*Vegetation mentioned under FP in* ***Section 6.1.2***	*Vegetation mentioned under Depressions in* ***Section 6.1.3***	*Vegetation mentioned under Depressions in* ***Section 6.1.3***
Algae Presence	*Slight amounts of Hair Algae*	*None observed*	*No surface water*	*No surface water*
Aquatic Faunal Impacts	*Major impacts would be on macroinvertebrate assemblage and aquatic dependent animals such as frogs and avifaunal species, as well as mammals*	*Major impacts would be on macroinvertebrate assemblage and aquatic dependent animals such as frogs and avifaunal species, as well as mammals*	*Major impacts would be on macroinvertebrate assemblage and aquatic dependent animals such as frogs and avifaunal species during the wet season, when such*	*Major impacts would be on macroinvertebrate assemblage and aquatic dependent animals such as frogs and avifaunal species during the wet season, when such species may be present*

			species may be present	
Depth Characteristics	*Not assessed*	*Not assessed*	*No water present*	*No water present*
Flow Conditions	*Slight flow observed*	*Heavy flow in the river but none in the FP*	*No water present*	*No water present*
Water Clarity	*Crystal clear*	*High loads of suspended sediment*	*No water present*	*No water present*
Water Odour	*No odour*	*No odour*	*No water present*	*No water present*
Erosion Impacts	*Moderate erosion potential. Steep topography and large size offset by dense vegetation cover and lack of disturbances*	*High erosion potential due to large size and very steep catchment*	*High erosion potential as wetland is devoid of vegetation*	*High erosion potential as wetland is devoid of vegetation*
Soil characteristics	*Gleyic clay soil within wetland*	*Redoximorphic features (mottling) was present within the wetland borders. Soil type was of a brown sandy clay.*	*Redoximorphic features (mottling) were present within the wetland borders. Soil type was of a sandy clay*	*Redoximorphic features (mottling) were present within the wetland borders. Soil type was sand*

6.2.2 WET-Health Assessment

The overall PES category for CVB, D1, and D2 was observed to be a B which means the functionality of the wetland is Slightly modified. They are largely natural, though with some modifications/disturbances. A slight change in ecosystem processes is discernible and a small loss of natural habitats and biota may have taken place. Impacts within these wetlands include transection by a road and the Vaalharts channel (In the case of CVB), some geomorphic changes (berms at the edge of the depressions). The large quantities of game in Depressions 1 and 2 have also resulted in a lack of vegetation and proliferation of some alien invasive plant species (Verbena bonariensis, Skraalhanse).

The overall PES Category for the FP wetland was observed to be an A which means that the wetland is unmodified. With that being noted, a decrease in the PES is likely to occur over the next few years if the prospecting activities occur within the exclusion zones, and if degradation occurs due to human activities.

6.2.4 Ecological Importance and Sensitivity

These results indicate that the Channelled Valley Bottom and Floodplain wetlands were calculated to fall within EIS Category B – High. It is an indication that these systems exhibit features that are considered to be ecologically important and sensitive at a regional scale. The functioning and/or biodiversity of these features are typically moderately sensitive to anthropogenic disturbances. They typically play an important role in providing ecological services at the local scale. The importance of the FP wetland is accentuated by its large size and high PES score, as well as the fact that it borders the Vaal River, a major river in South Africa. The CVB wetland also has a high PES score and is the only other wetland on the southern portion of the application area. It is very densely vegetated by natural wetland plants and also flows into the Vaal river just West of the application area. Both of these wetlands exhibited very little disturbances (the CVB was only disturbed from being transected by a road as well as the Vaalharts channel).

The two Depression wetlands were recorded to fall within EIS category C- Moderate. These depressions are endoreic and possess features that are considered to be ecologically important and sensitive at a local scale. The functioning and/or biodiversity of these features is not usually sensitive to anthropogenic disturbances. They typically play a small role in providing ecological services at the local scale. These are the only two natural wetlands accessible to game on the northern part of the application area and provide a seasonal supply of water for the animals that inhabit this portion of the application area.

6.3 Buffer Zone Determination

The recommended/exclusion buffer zones were calculated to be 38m (CVB 1 and associated drainage lines), 53m (FP and associated drainage lines), and 37m (Depressions 1 and 2) and 55m (Depression 1) given that mitigation measures suggested will be adhered to.

6.4 Summary of Results

The results recorded for the wetlands potentially affected by the prospecting activities are summarised in Table 22 below.

Classification	Scientific Buffer	PES	EIS	REC
CVB 1	*38m*	*B*	*High*	*A Improve*
UVB 2	*53m*	*A*	*High*	*A maintain*
D1 & D2	*37m*	*B*	*Moderate*	*B Maintain*

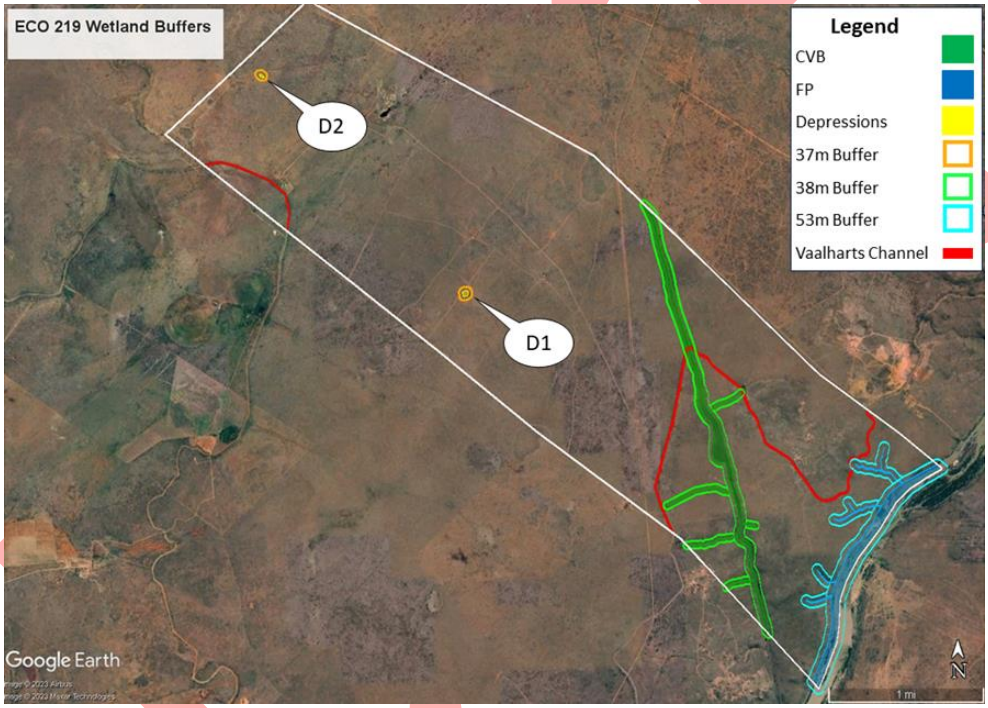


Figure 30. Wetlands and their associated buffers

The Wetland vegetation that the site has been associated with is the Eastern Kalahari Bushveld Group 3, as depicted in the figure below.

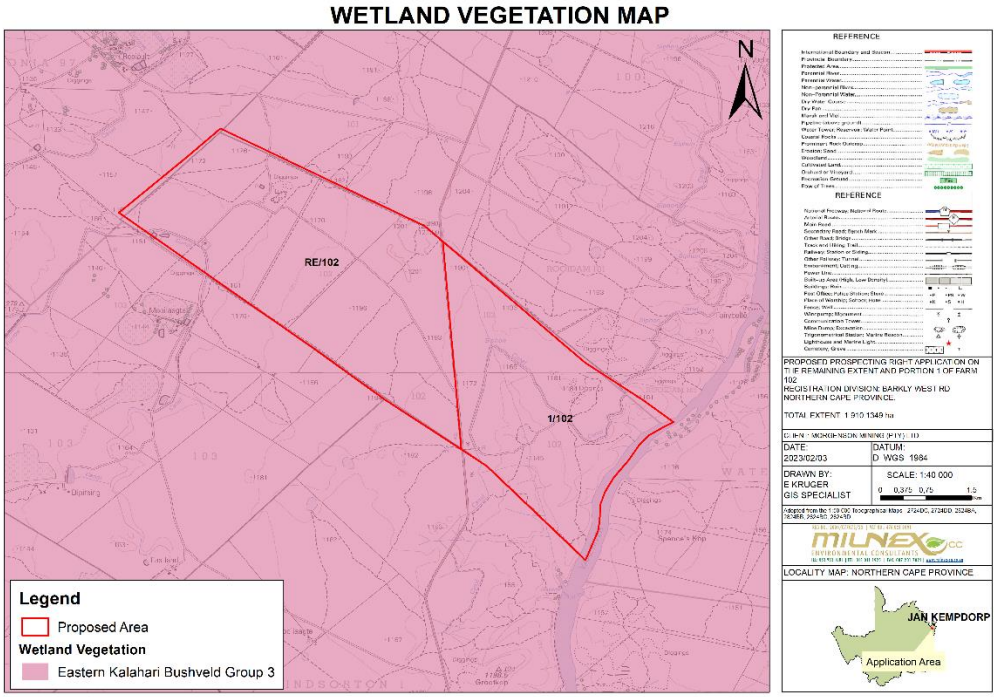


Figure 17: Wetland vegetation type

IMPORTANT BIRD AND BIODIVERSITY AREAS

Important Bird and Biodiversity Areas (IBAs) are a network of sites that are significant for the long-term viability of naturally occurring bird populations (Birdlife 2019). Many sites are also important for other forms of biodiversity; therefore, the conservation of Important Bird & Biodiversity Areas ensures the survival of a correspondingly large number of other animals and plants.

No IBAs were identified within the vicinity of the study site (**Figure 18**).

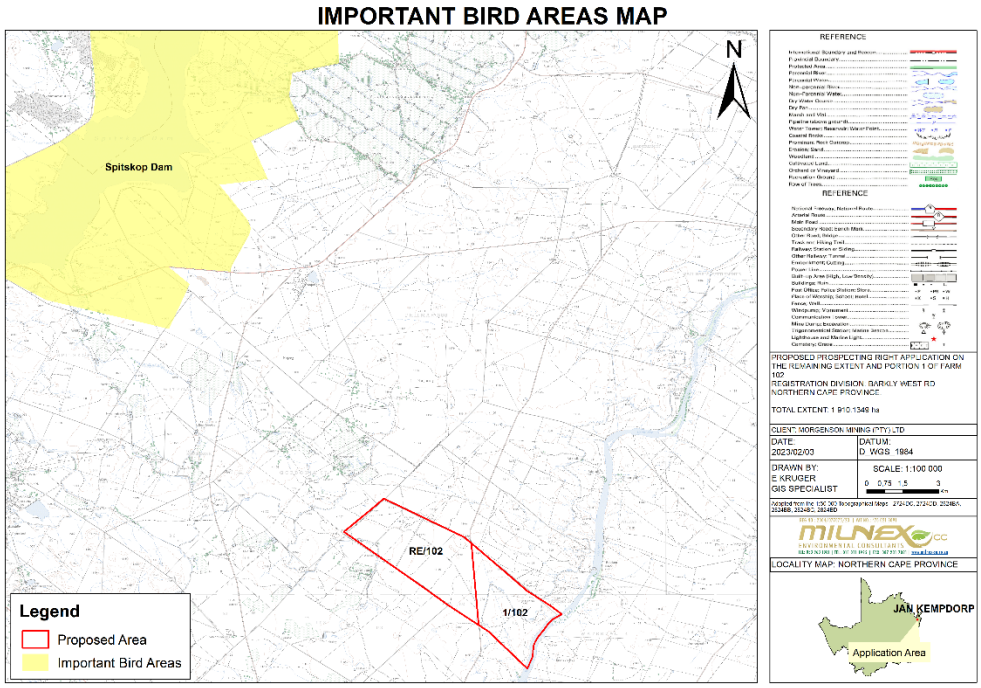


Figure 18: Important Bird and Biodiversity Areas associated with the study site.

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

4.3.1 Avifauna

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.

A non-comprehensive bird list of the application area was created (Table 11) by combining occurrence data from SABAP2 with species observed by the specialist on site (highlighted in green). Anecdotal evidence by the landowner suggests that the Vulnerable and protected species Ardeotis kori (Kori Bustard) as well as Endangered Sagittarius serpentarius (Secretary bird) occurs on site. Though the specialist did not note these avifaunal species, the landowner recalls multiple sightings of these species on the RE of the application area. The Kori bustard is the largest flying bird native to Africa and occurs in open grassy areas often characterized by sandy soil, especially Kalahari sands, as well as short grass near the cover of clumps of trees or bushes. The Secretary bird prefers open grasslands, savannas, and Karoo shrubland. There is ample suitable habitat for these species on site. Though there were not any other species of conservation concern or threatened or protected species recorded within the application area or its immediate surroundings, it does not mean that such species may not on occasion occur or nest on site. Their presence may yet be recorded on the application area in the future.

Table 11: *List of Birds Possibly Occurring on Site (SABAP2, 2023)*

Common species	**Common group**	**Genus**	**species**	**IUCN and SA Redlist status**	**ToPS**
Kori	**Bustard**	**Ardeotis**	**kori**	**Vulnerable**	**Yes**
Common	Myna	*Acridotheres*	*tristis*	Least concern	No
Common Reed	Warbler	*Acrocephalus*	*baeticatus*	Least concern	No
Lesser Swamp	Warbler	*Acrocephalus*	*gracilirostris*	Least concern	No
Common	Sandpiper	*Actitis*	*hypoleucos*	Least concern	No
African	Jacana	*Actophilornis*	*africanus*	Least concern	No
Northern Black	Korhaan	*Afrotis*	*afraoides*	Least concern	No
Egyptian	Goose	*Alopochen*	*aegyptiaca*	Least concern	No
Red-headed	Finch	*Amadina*	*erythrocephala*	Least concern	No
Red-billed	Teal	*Anas*	*erythrorhyncha*	Least concern	No
African Black	Duck	*Anas*	*sparsa*	Least concern	No
Yellow-billed	Duck	*Anas*	*undulata*	Least concern	No
African	Openbill	*Anastomus*	*lamelligerus*	Least concern	No
African	Darter	*Anhinga*	*rufa*	Least concern	No
African	Pipit	*Anthus*	*cinnamomeus*	Least concern	No
Little	Swift	*Apus*	*affinis*	Least concern	No
Bradfield's	Swift	*Apus*	*bradfieldi*	Least concern	No
White-rumped	Swift	*Apus*	*caffer*	Least concern	No
Great	Egret	*Ardea*	*alba*	Least concern	No
Grey	Heron	*Ardea*	*cinerea*	Least concern	No
Goliath	Heron	*Ardea*	*goliath*	Least concern	No
Intermediate	Egret	*Ardea*	*intermedia*	Least concern	No

Black-headed	Heron	*Ardea*	*melanocephala*	Least concern	No
Purple	Heron	*Ardea*	*purpurea*	Least concern	No
Squacco	Heron	*Ardeola*	*ralloides*	Least concern	No
Pririt	Batis	*Batis*	*pririt*	Least concern	No
Hadada	Ibis	*Bostrychia*	*hagedash*	Least concern	No
Black-faced	Waxbill	*Brunhilda*	*erythronotos*	Least concern	No
Western Cattle	Egret	*Bubulcus*	*ibis*	Least concern	No
Striated	Heron	*Butorides*	*striata*	Least concern	No
Golden-tailed	Woodpecker	*Campethera*	*abingoni*	Least concern	No
Greater Striped	Swallow	*Cecropis*	*cucullata*	Least concern	No
Red-breasted	Swallow	*Cecropis*	*semirufa*	Least concern	No
Burchell's	Coucal	*Centropus*	*burchellii*	Least concern	No
Karoo	Scrub Robin	*Cercotrichas*	*coryphoeus*	Least concern	No
Kalahari	Scrub Robin	*Cercotrichas*	*paena*	Least concern	No
Eastern Long-billed	Lark	*Certhilauda*	*semitorquata*	Least concern	No
Pied	Kingfisher	*Ceryle*	*rudis*	Least concern	No
Three-banded	Plover	*Charadrius*	*tricollaris*	Least concern	No
Grey-headed	Gull	*Chroicocephalus*	*cirrocephalus*	Least concern	No
Diederik	Cuckoo	*Chrysococcyx*	*caprius*	Least concern	No
Dusky	Sunbird	*Cinnyris*	*fuscus*	Least concern	No
White-bellied	Sunbird	*Cinnyris*	*talatala*	Least concern	No
Desert	Cisticola	*Cisticola*	*aridulus*	Least concern	No
Neddicky		*Cisticola*	*fulvicapilla*	Least concern	No
Zitting	Cisticola	*Cisticola*	*juncidis*	Least concern	No
Levaillant's	Cisticola	*Cisticola*	*tinniens*	Least concern	No
Jacobin	Cuckoo	*Clamator*	*jacobinus*	Least concern	No
White-backed	Mousebird	*Colius*	*colius*	Least concern	No
Speckled	Mousebird	*Colius*	*striatus*	Least concern	No
Speckled	Pigeon	*Columba*	*guinea*	Least concern	No
Rock	Dove	*Columba*	*livia*	Least concern	No
Pied	Crow	*Corvus*	*albus*	Least concern	No
Malachite	Kingfisher	*Corythornis*	*cristatus*	Least concern	No
Cape	Robin-Chat	*Cossypha*	*caffra*	Least concern	No
Wattled	Starling	*Creatophora*	*cinerea*	Least concern	No
Black-throated	Canary	*Crithagra*	*atrogularis*	Least concern	No
Yellow	Canary	*Crithagra*	*flaviventris*	Least concern	No
Red-chested	Cuckoo	*Cuculus*	*solitarius*	Least concern	No
Chestnut-vented	Warbler	*Curruca*	*subcoerulea*	Least concern	No
African Palm	Swift	*Cypsiurus*	*parvus*	Least concern	No
White-faced Whistling	Duck	*Dendrocygna*	*viduata*	Least concern	No
Cardinal	Woodpecker	*Dendropicos*	*fuscescens*	Least concern	No
Black	Heron	*Egretta*	*ardesiaca*	Least concern	No
Little	Egret	*Egretta*	*garzetta*	Least concern	No
Black-winged	Kite	*Elanus*	*caeruleus*	Least concern	No

Golden-breasted	Bunting	*Emberiza*	*flaviventris*	Least concern	No
Cinnamon-breasted	Bunting	*Emberiza*	*tahapisi*	Least concern	No
Yellow-bellied	Eremomela	*Eremomela*	*icteropygialis*	Least concern	No
Grey-backed	Sparrow-Lark	*Eremopterix*	*verticalis*	Least concern	No
Common	Waxbill	*Estrilda*	*astrild*	Least concern	No
Southern Red	Bishop	*Euplectes*	*orix*	Least concern	No
Lesser	Kestrel	*Falco*	*naumanni*	Least concern	No
Greater	Kestrel	*Falco*	*rupicoloides*	Least concern	No
Red-knobbed	Coot	*Fulica*	*cristata*	Least concern	No
Common	Moorhen	*Gallinula*	*chloropus*	Least concern	No
White-backed	Vulture	*Gyps*	*africanus*	Least concern	No
Brown-hooded	Kingfisher	*Halcyon*	*albiventris*	Least concern	No
African Fish	Eagle	*Haliaeetus*	*vocifer*	Least concern	No
Black-winged	Stilt	*Himantopus*	*himantopus*	Least concern	No
White-throated	Swallow	*Hirundo*	*albigularis*	Least concern	No
Barn	Swallow	*Hirundo*	*rustica*	Least concern	No
Caspian	**Tern**	***Hydroprogne***	***caspia***	**Least concern**	**Yes**
Lesser	Honeyguide	*Indicator*	*minor*	Least concern	No
Little	Bittern	*Ixobrychus*	*minutus*	Least concern	No
Red-throated	Wryneck	*Jynx*	*ruficollis*	Least concern	No
Jameson's	Firefinch	*Lagonosticta*	*rhodopareia*	Least concern	No
Red-billed	Firefinch	*Lagonosticta*	*senegala*	Least concern	No
Cape	Starling	*Lamprotornis*	*nitens*	Least concern	No
Southern	Fiscal	*Lanius*	*collaris*	Least concern	No
Red-backed	Shrike	*Lanius*	*collurio*	Least concern	No
Lesser Grey	Shrike	*Lanius*	*minor*	Least concern	No
Black-collared	Barbet	*Lybius*	*torquatus*	Least concern	No
Giant	Kingfisher	*Megaceryle*	*maxima*	Least concern	No
Fiscal	Flycatcher	*Melaenornis*	*silens*	Least concern	No
Ashy	Tit	*Melaniparus*	*cinerascens*	Least concern	No
Pale Chanting	Goshawk	*Melierax*	*canorus*	Least concern	No
European	Bee-eater	*Merops*	*apiaster*	Least concern	No
White-fronted	Bee-eater	*Merops*	*bullockoides*	Least concern	No
Reed	Cormorant	*Microcarbo*	*africanus*	Least concern	No
Gabar	Goshawk	*Micronisus*	*gabar*	Least concern	No
Rufous-naped	Lark	*Mirafra*	*africana*	Least concern	No
Eastern Clapper	Lark	*Mirafra*	*fasciolata*	Least concern	No
Short-toed Rock	Thrush	*Monticola*	*brevipes*	Least concern	No
African Pied	Wagtail	*Motacilla*	*aguimp*	Least concern	No
Cape	Wagtail	*Motacilla*	*capensis*	Least concern	No
Spotted	Flycatcher	*Muscicapa*	*striata*	Least concern	No
Ant-eating	Chat	*Myrmecocichla*	*formicivora*	Least concern	No
Brubru		*Nilaus*	*afer*	Least concern	No
Helmeted	Guineafowl	*Numida*	*meleagris*	Least concern	No

Black-crowned Night	Heron	*Nycticorax*	*nycticorax*	Least concern	No
Namaqua	Dove	*Oena*	*capensis*	Least concern	No
Familiar	Chat	*Oenanthe*	*familiaris*	Least concern	No
Southern Grey-headed	Sparrow	*Passer*	*diffusus*	Least concern	No
House	Sparrow	*Passer*	*domesticus*	Least concern	No
Cape	Sparrow	*Passer*	*melanurus*	Least concern	No
South African Cliff	Swallow	*Petrochelidon*	*spilodera*	Least concern	No
White-breasted	Cormorant	*Phalacrocorax*	*lucidus*	Least concern	No
African	Spoonbill	*Platalea*	*alba*	Least concern	No
Spur-winged	Goose	*Plectropterus*	*gambensis*	Least concern	No
Glossy	Ibis	*Plegadis*	*falcinellus*	Least concern	No
White-browed	Sparrow-Weaver	*Plocepasser*	*mahali*	Least concern	No
Southern Masked	Weaver	*Ploceus*	*velatus*	Least concern	No
Pygmy	Falcon	*Polihierax*	*semitorquatus*	Least concern	No
Black-chested	Prinia	*Prinia*	*flavicans*	Least concern	No
Natal	Spurfowl	*Pternistis*	*natalensis*	Least concern	No
Swainson's	Spurfowl	*Pternistis*	*swainsonii*	Least concern	No
Namaqua	Sandgrouse	*Pterocles*	*namaqua*	Least concern	No
Rock	Martin	*Ptyonoprogne*	*fuligula*	Least concern	No
African Red-eyed	Bulbul	*Pycnonotus*	*nigricans*	Least concern	No
Green-winged	Pytilia	*Pytilia*	*melba*	Least concern	No
Red-billed	Quelea	*Quelea*	*quelea*	Least concern	No
Common	Scimitarbill	*Rhinopomastus*	*cyanomelas*	Least concern	No
Brown-throated	Martin	*Riparia*	*paludicola*	Least concern	No
Sand	Martin	*Riparia*	*riparia*	Least concern	No
Secretarybird		***Sagittarius***	***serpentarius***	**Endangered**	**YES**
African	Stonechat	*Saxicola*	*torquatus*	Least concern	No
Orange River	Francolin	*Scleroptila*	*gutturalis*	Least concern	No
Hamerkop		*Scopus*	*umbretta*	Least concern	No
Cape	Shoveler	*Spatula*	*smithii*	Least concern	No
Laughing	Dove	*Spilopelia*	*senegalensis*	Least concern	No
Scaly-feathered	Weaver	*Sporopipes*	*squamifrons*	Least concern	No
Fairy	Flycatcher	*Stenostira*	*scita*	Least concern	No
Cape Turtle	Dove	*Streptopelia*	*capicola*	Least concern	No
Red-eyed	Dove	*Streptopelia*	*semitorquata*	Least concern	No
Common	Ostrich	*Struthio*	*camelus*	Least concern	No
Common	Starling	*Sturnus*	*vulgaris*	Least concern	No
Long-billed	Crombec	*Sylvietta*	*rufescens*	Least concern	No
Little	Grebe	*Tachybaptus*	*ruficollis*	Least concern	No
Alpine	Swift	*Tachymarptis*	*melba*	Least concern	No
South African	Shelduck	*Tadorna*	*cana*	Least concern	No
Brown-crowned	Tchagra	*Tchagra*	*australis*	Least concern	No
Bokmakierie		*Telophorus*	*zeylonus*	Least concern	No

African Paradise	Flycatcher	*Terpsiphone*	*viridis*	Least concern	No
African Sacred	Ibis	*Threskiornis*	*aethiopicus*	Least concern	No
Crested	Barbet	*Trachyphonus*	*vaillantii*	Least concern	No
Acacia Pied	Barbet	*Tricholaema*	*leucomelas*	Least concern	No
Wood	Sandpiper	*Tringa*	*glareola*	Least concern	No
Common	Greenshank	*Tringa*	*nebularia*	Least concern	No
Groundscraper	Thrush	*Turdus*	*litsitsirupa*	Least concern	No
Karoo	Thrush	*Turdus*	*smithi*	Least concern	No
African	Hoopoe	*Upupa*	*africana*	Least concern	No
Red-faced	Mousebird	*Urocolius*	*indicus*	Least concern	No
Blacksmith	Lapwing	*Vanellus*	*armatus*	Least concern	No
Crowned	Lapwing	*Vanellus*	*coronatus*	Least concern	No
Village	Indigobird	*Vidua*	*chalybeata*	Least concern	No
Pin-tailed	Whydah	*Vidua*	*macroura*	Least concern	No
Long-tailed Paradise	Whydah	*Vidua*	*paradisaea*	Least concern	No
Orange River	White-eye	*Zosterops*	*pallidus*	Least concern	No
Cape	White-eye	*Zosterops*	*virens*	Least concern	No

RIVER ECOSYSTEM STATUS

According to **Figure 19**, the Vaal River boarding the proposed area, falls in Class D: Largely Modified.

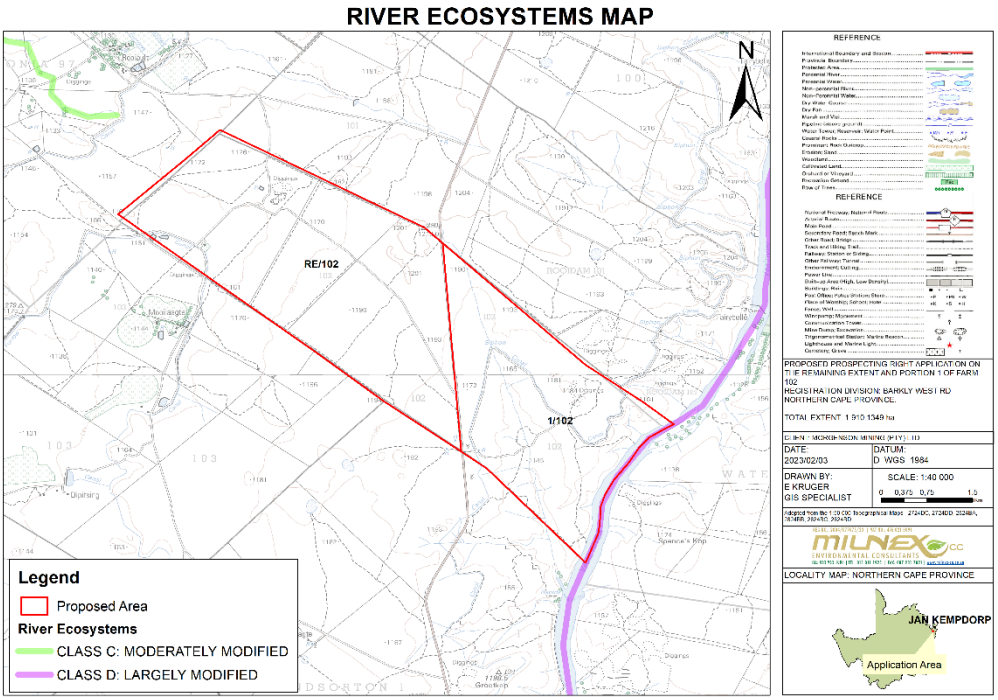


Figure 19: Ecosystem status of the rivers occurring in close proximity to the study site.

STRATEGIC WATER SOURCE AREA

Water source areas are those areas that supply a disproportionate amount of mean annual runoff to a geographical region of interest. Strategic water source areas are those that supply substantial downstream economies and urban centres. These water source areas are vital to the national economy (Nel et al., 2013).

According to **Figure 20**, the proposed area does not fall within a Strategic Water Source Area.

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

According to desktop results, the study area does not overlap any of the strategic water source areas.

STRATEGIC WATER SOURCE AREA MAP

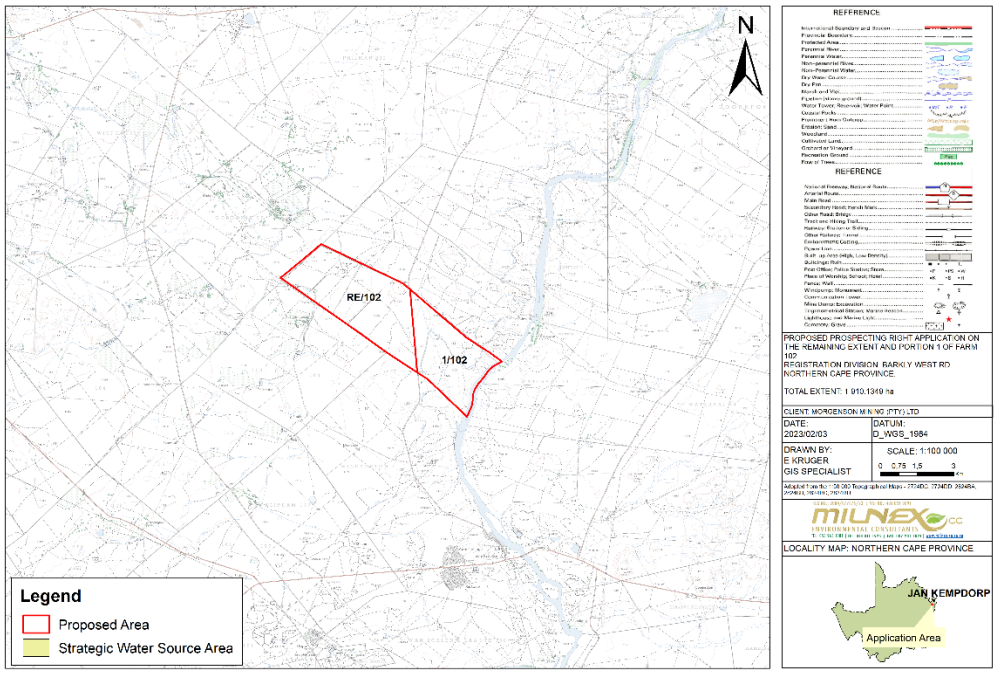


Figure 20: Strategic Water Source Area map

DESCRIPTION OF THE SOCIO-ECONOMIC ENVIRONMENT

FRANCES BAARD DISTRICT MUNICIPALITY

DEMOGRAPHIC COMPOSITION

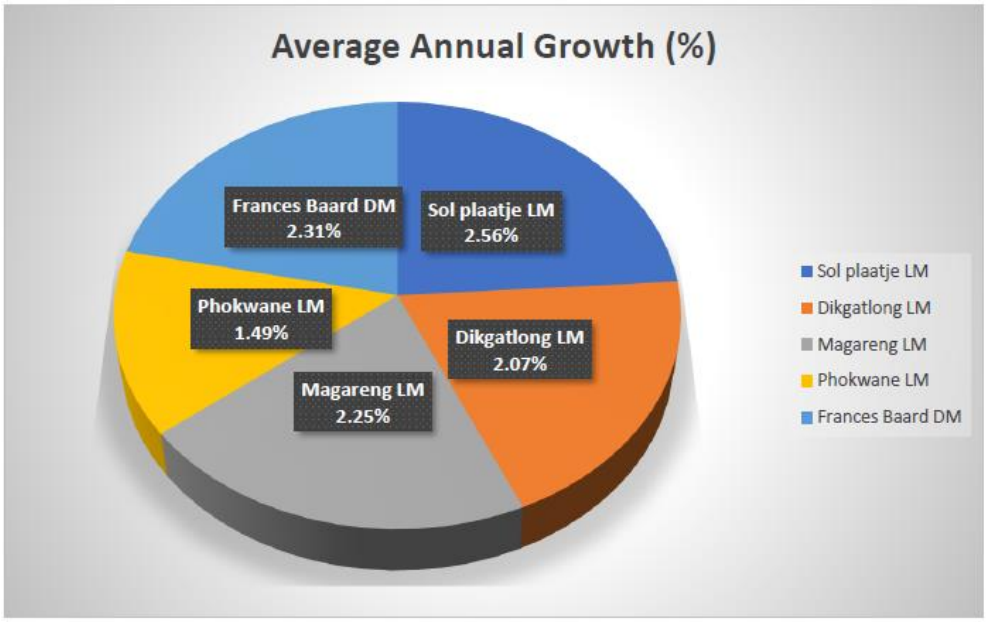
The district has a total population of 439 000, of which 225, 906 (51.47%) are females and 212, 995 (48.53%) are males. Frances Baard District housed 0.7% of South Africa's total population in 2019. Between 2009 and 2019 the population growth averaged 2.31% per annum which is slightly higher than the growth rate of South Africa as a whole (1.61%). In comparison to the Northern Cape's average annual growth rate (2.05%), the growth rate of the Frances Baard district population at 2.31% was very similar to that of the province (see table 1 and figure 3 below).

Table 1: Frances Baard District's total population growth since 2009

Municipalities	2009	2014	2019
Sol Plaatje	228,000	262,000	293,000
Dikgatlong	40,400	45,100	49,600
Magareng	22,200	24,800	27,700
Phokwane	59,000	63,200	68,500
Frances Baard	349,329	394,694	438,901

Source: IHS Markit Regional explorer version 1990

Figure 3: Frances Baard district average annual growth%



The Sol Plaatje Local Municipality increased the most, in terms of population, with an average annual growth rate of 2.6%, the Magareng Local Municipality had the second highest growth in terms of its population, with an average annual growth rate of 2.3%, while the Phokwane Local Municipality had the lowest average annual growth rate of 1.49% relative to the other within the Frances Baard District Municipality.

POPULATION BY POPULATION GROUP, GENDER AND AGE

The total population of a region is the total number of people within that region measured in the middle of the year. Total population can be categorised according to the population group, as well as the sub- categories of age and gender. The population groups include African, White, Coloured and Asian, where the Asian group includes all people originating from Asia, India and China. The age subcategory divides the population into 5-year cohorts.

Frances Baard District Municipality's male/female split in population was 94.3 males per 100 females in 2019. The Frances Baard District Municipality appears to be a stable population with the share of female population (51.47%) being similar to the national average of (51.04%). In total there were 226 000 (51.47%) females and 213 000 (48.53%) males. This is different from the Northern Cape Province, where the female population counted 681 000 which constitutes 50.61% of the total population of 1.34 million (see table 2 below).

Table 2: Population by gender (Northern Cape)

District Municipalities	Male	Female	Total
Frances Baard	212,995	225,906	438,901
Namakwa	69,639	69,742	139,381
Pixley ka Seme	109,003	111,839	220,842
ZF Mgcawu	144,910	139,481	284,391
John Taolo Gaetsewe	127,749	133,615	261,363
Northern Cape	**664,296**	**680,582**	**1,344,878**

In 2019, the Frances Baard District Municipality's population consisted of 68.39% African (300 000), 6.34% White (27 800), 24.42% Coloured (107 000) and 0.85% Asian (3 720) people. The largest share of population is within the young working age (25-44 years) age category with a total number of 140 000 or 32.0% of the total population. The age category with the second largest number of people is the children (0-14 years) age category with a total share of 29.3%, followed by the late middle age (45-64 years) age category with 76 600 people. The age category with the least number of people is the retired / old age (65 years and older) age category with only 27 600 people (refer to table 3 below).

Table 3: Frances Baard District Population by group, gender and age (2019)

Age Group	African		White		Coloured		Asian	
	Female	Male	Female	Male	Female	Male	Female	Male
00-04	16,700	17,200	708	771	5,090	5,020	149	191
05-09	15,900	16,900	666	647	4,460	4,530	147	109
10-14	14,700	14,500	655	642	4,350	4,500	81	63
15-19	11,200	11,000	858	714	4,400	4,290	125	127
20-24	10,800	9,970	843	880	5,260	5,010	151	119
25-29	13,300	11,000	897	816	4,860	4,880	76	183
30-34	14,700	13,400	978	1,020	4,380	4,090	147	187
35-39	12,700	13,100	956	903	3,970	3,680	136	276
40-44	10,000	11,200	968	720	3,450	3,220	74	217
45-49	8,500	8,710	945	892	3,360	3,060	75	239
50-54	7,770	6,600	889	934	3,200	2,850	112	206
55-59	5,540	4,040	1,100	875	2,570	2,190	58	113
60-64	3,480	2,630	953	829	2,060	1,660	56	56
65-69	3,230	2,140	915	815	1,620	1,110	44	32
70-74	2,800	2,060	867	668	1,160	919	52	21
75+	2,960	1,610	1,510	980	1,260	789	61	38
Total	**154,000**	**146,000**	**14,700**	**13,100**	**55,400**	**51,800**	**1,540**	**2,180**

Source: IHS Markit Regional eXplorer version 1990

Although the statistics in table 3 depict that a large percentage of the district's population comprises of young people, the education levels in the district do not tell a pleasant story. According to community survey 2016, the district comprises of large numbers of low levels of education. Table 4 and figure 4 exemplifies the state of education in the district.

It is alarming to note that only 5.04% of the population have Higher/National/Advanced certificates with Grade 12/Occupational certificate NQ or higher in the district, considering that education is one of the government's key priorities, to ensure economic growth and stability and combat poverty in South Africa.

ECONOMIC ANALYSIS

The economic state of the Frances Baard District is put into perspective by comparing it on a spatial level with its neighbouring district municipalities. The section will also allude to the economic composition and contribution of the regions within Frances Baard District Municipality. The Frances Baard District Municipality does not function in isolation from Northern Cape, South Africa and the world and now, more than ever, it is crucial to have reliable information on its economy for effective planning. Information is needed that will empower the municipality to plan and implement policies that will encourage the social development and economic growth of the people and industries in the municipality, respectively.

With a GDP of R 35.6 billion in 2019 (up from R 19.3 billion in 2009), the Frances Baard District Municipality contributed 34.74% to the Northern Cape Province GDP of R 102 billion in 2019 increasing in the share of the Northern Cape from 35.36% in 2009. The Frances Baard District Municipality contributes 0.70% to the GDP of South Africa which had a total GDP of R 5.08 trillion in 2019 (as measured in nominal or current prices). It's contribution to the national economy stayed similar in importance from 2009 when it contributed 0.77% to South Africa, but it is lower than the peak of 0.80% in 2014 (see table 6).

Table 6: GDP- Frances Baard District, Northern Cape and National Total 2009-2019

	Frances Baard	Northern Cape	National Total	Frances Baard as % of province	Frances Baard as % of national
2009	19.3	54.4	2,507.7	*35.4%*	*0.77%*
2010	21.1	60.1	2,748.0	*35.1%*	*0.77%*
2011	22.5	64.0	3,023.7	*35.2%*	*0.74%*
2012	24.1	68.2	3,253.9	*35.4%*	*0.74%*
2013	25.5	72.6	3,540.0	*35.2%*	*0.72%*
2014	30.3	83.5	3,805.3	*36.3%*	*0.80%*
2015	31.8	86.2	4,049.9	*36.9%*	*0.78%*
2016	33.1	90.4	4,359.1	*36.6%*	*0.76%*
2017	34.4	96.5	4,653.6	*35.7%*	*0.74%*
2018	35.5	100.1	4,873.9	*35.5%*	*0.73%*
2019	35.6	102.4	5,077.6	*34.7%*	*0.70%*

Source: IHS Markit Regional eXplorer version 1990

In 2019, the Frances Baard District Municipality achieved an annual growth rate of -1.06% which is significantly lower GDP growth than the Northern Cape Province's 0.02%, and is lower than that of South Africa, where the 2019 GDP growth rate was 0.15%. Like the short-term growth rate of 2019, the longer-term average growth rate for Frances Baard (0.55%) is also significantly lower than that of South Africa (1.68%). The economic growth in Frances Baard peaked in 2012 at 2.26% (see table 7 below).

Table 7: GDP - Frances Baard District, NC and National total, 2009-2019 (annual percentage change)

	Frances Baard	Northern Cape	National Total
2009	-4.6%	-2.3%	-1.5%
2010	1.0%	2.2%	3.0%
2011	0.8%	2.0%	3.3%
2012	2.3%	3.2%	2.2%
2013	1.6%	2.4%	2.5%
2014	0.7%	3.0%	1.8%
2015	0.2%	1.1%	1.2%
2016	-0.8%	-1.2%	0.4%
2017	0.6%	2.8%	1.4%
2018	0.4%	0.5%	0.8%
2019	-1.1%	0.0%	0.2%
Average Annual growth 2009-2019	***0.55%***	***1.59%***	***1.68%***

Source: IHS Markit Regional eXplorer version 1990

Dikgatlong had the highest average annual economic growth, averaging 0.96% between 2009 and 2019, when compared to the rest of the regions within the Frances Baard District Municipality. The Sol Plaatje Local Municipality had the second highest average annual growth rate of 0.70%. Magareng Local Municipality had the lowest average annual growth rate of -0.66% between 2009 and 2019 (see table 8 below).

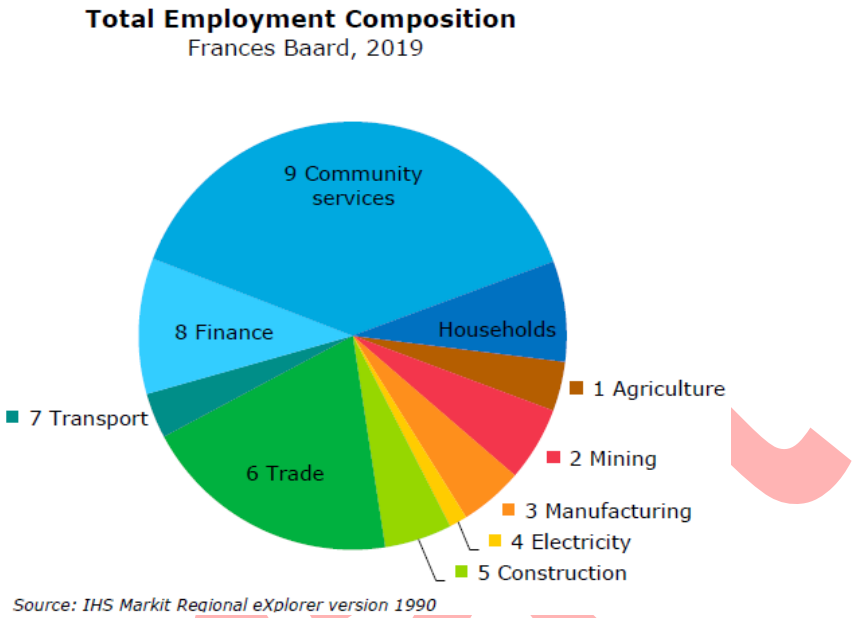
Table 8: GDP Frances Baard Distrct local municipalities 2009 -2019, share and growth

Municipalities	2019 (Current prices)	Share of district municipality	2009 (Constant prices)	2019 (Constant prices)	Average Annual growth
Sol Plaatje	28.05	*78.84%*	16.19	17.35	***0.70%***
Dikgatlong	2.78	*7.83%*	1.67	1.84	***0.96%***
Magareng	1.11	*3.12%*	0.70	0.66	***-0.66%***
Phokwane	3.63	*10.21%*	2.33	2.22	***-0.47%***
Frances Baard	35.57		20.89	22.07	

Source: IHS Markit Regional eXplorer version 1990

In Frances Baard District the economic sectors that recorded the largest number of employment in 2019 were the community services sector with a total of 40 700 employed people or 38.5% of total employment in the district municipality. The trade sector with a total of 20 700 (19.6%) employs the second highest number of people relative to the rest of the sectors. The electricity sector with 1 450 (1.4%) is the sector that employs the least number of people in Frances Baard District Municipality, followed by the transport sector with 3 630 (3.4%) people employed (see figure 5 below).

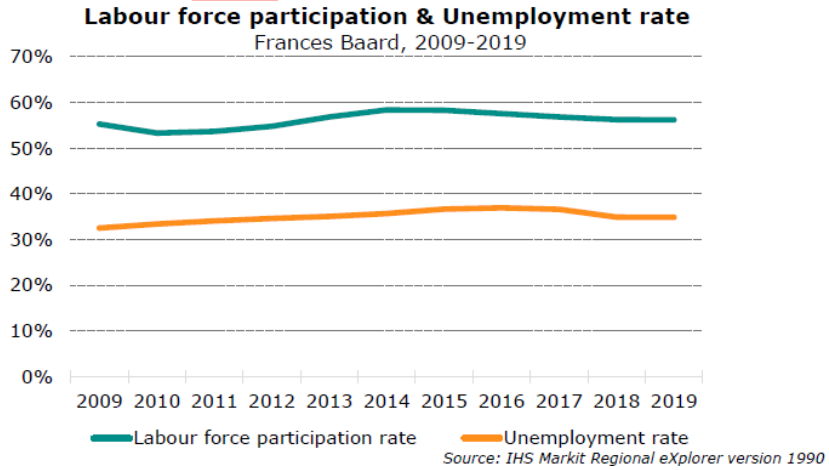
Figure 5: Total Employment Composition



In 2019 the labour force participation rate for Frances Baard was at 56.2% which is similar when compared to the 55.3% in 2009. The unemployment rate is an efficient indicator that measures the success rate of the labour force relative to employment. In 2009, the unemployment rate for Frances Baard was 32.5% and increased overtime to 34.9% in 2019. The gap between the labour force participation rate and the unemployment rate decreased which indicates a negative outlook for the employment within Frances Baard District (see figure 6 below).

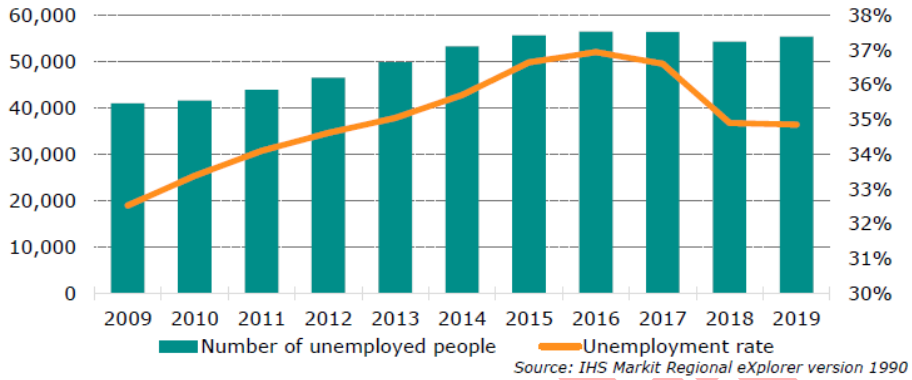
In 2019 the labour force participation rate for Frances Baard was at 56.2% which is similar when compared to the 55.3% in 2009. The unemployment rate is an efficient indicator that measures the success rate of the labour force relative to employment. In 2009, the unemployment rate for Frances Baard was 32.5% and increased overtime to 34.9% in 2019. The gap between the labour force participation rate and the unemployment rate decreased which indicates a negative outlook for the employment within Frances Baard District (see figure 6 below).

Figure 6: Unemployment rate



When comparing unemployment rates among regions within Frances Baard District Municipality, Magareng Local Municipality has indicated the highest unemployment rate of 43.6%, which has increased from 41.2% in 2009. Sol Plaatje Local Municipality had the lowest unemployment rate of 32.5% in 2019, which increased from 31.0% in 2009 (see figure 7 below).

Figure 7: Number of unemployed and unemployment rate



Source: IHS Markit Regional eXplorer version 1990

The number of households is grouped according to predefined income categories or brackets, where income is calculated as the sum of all household gross disposable income: payments in kind, gifts, homemade goods sold, old age pensions, income from informal sector activities, subsistence income, etc.). Note that income tax is included in the income distribution.

Income categories start at R0 - R2,400 per annum and go up to R2,400,000+ per annum. A household is either a group of people who live together and provide themselves jointly with food and/or other essentials for living, or it is a single person living on his/her own. These income brackets do not take into account inflation creep: over time, movement of households "up" the brackets is natural, even if they are not earning any more in real terms.

Table 9: Household income

Income category	Frances Baard	Northern Cape	National Total	Frances Baard as % of province	Frances Baard as % of national
0-2400	11	28	1,580	*39.3%*	*0.69%*
2400-6000	237	681	31,000	*34.8%*	*0.76%*
6000-12000	2,030	5,160	304,000	*39.3%*	*0.67%*
12000-18000	3,920	10,300	596,000	*38.1%*	*0.66%*
18000-30000	11,500	31,600	1,740,000	*36.2%*	*0.66%*
30000-42000	12,200	34,400	1,780,000	*35.6%*	*0.69%*
42000-54000	10,600	31,600	1,610,000	*33.6%*	*0.66%*
54000-72000	11,900	38,800	1,780,000	*30.8%*	*0.67%*
72000-96000	11,500	38,300	1,620,000	*30.0%*	*0.71%*
96000-132000	10,800	38,000	1,560,000	*28.5%*	*0.69%*
132000-192000	11,000	37,900	1,500,000	*28.9%*	*0.73%*
192000-360000	14,100	47,900	1,920,000	*29.5%*	*0.74%*
360000-600000	8,880	29,700	1,270,000	*29.9%*	*0.70%*
600000-1200000	6,140	21,200	934,000	*29.0%*	*0.66%*
1200000-2400000	1,720	6,680	322,000	*25.7%*	*0.53%*
2400000+	219	970	54,000	*22.6%*	*0.40%*
Total	**117,000**	**373,000**	**17,000,000**	***31.3%***	***0.69%***

Source: IHS Markit Regional eXplorer version 1990

It was estimated that in 2019 15.10% of all the households in the Frances Baard District Municipality, were living on R30,000 or less per annum. In comparison with 2009's 28.33%, the number is close to half. The 192000-360000 income category has the highest number of households with a total number of 14 200, followed by the 30000-42000 income category with 12 200 households. Only 11 households fall within the 0-2400 income category

Magareng Local Municipality

Magareng Local Municipality is situated on the N12 approximately 74 km north of Kimberley. The railway line to Gauteng and the N19 National Road to Vryburg also run through the only urban settlement area, Warrenton. To capitalize on the location of Warrenton on the N12 as well as on the N18.

- •Explore the potential of the location on a development corridor between Phokwane to the north and Sol Plaatje to the south.
- Enhancement of the regional function of Warrenton supporting mining communities.
- Development of Warrenton as a dormitory settlement area to Kimberley.
- Professional development of the urban structure by means of renewal programmes and higher urban densities

CULTURAL AND HERITAGE ASPECTS

A Palaeontological Desktop Assessment was conducted by Elize Butler from Banzai Environmental (Pty) Ltd and a Cultural Heritage Impact Assessment was conducted by Francois P. Coetzee. The reports are available under **Annexure 12**.

According to the DFFE Screening Report the proposed area falls within low Archaeological and Cultural Heritage Theme Sensitivity. Please see colour map under **Appendix 7.**

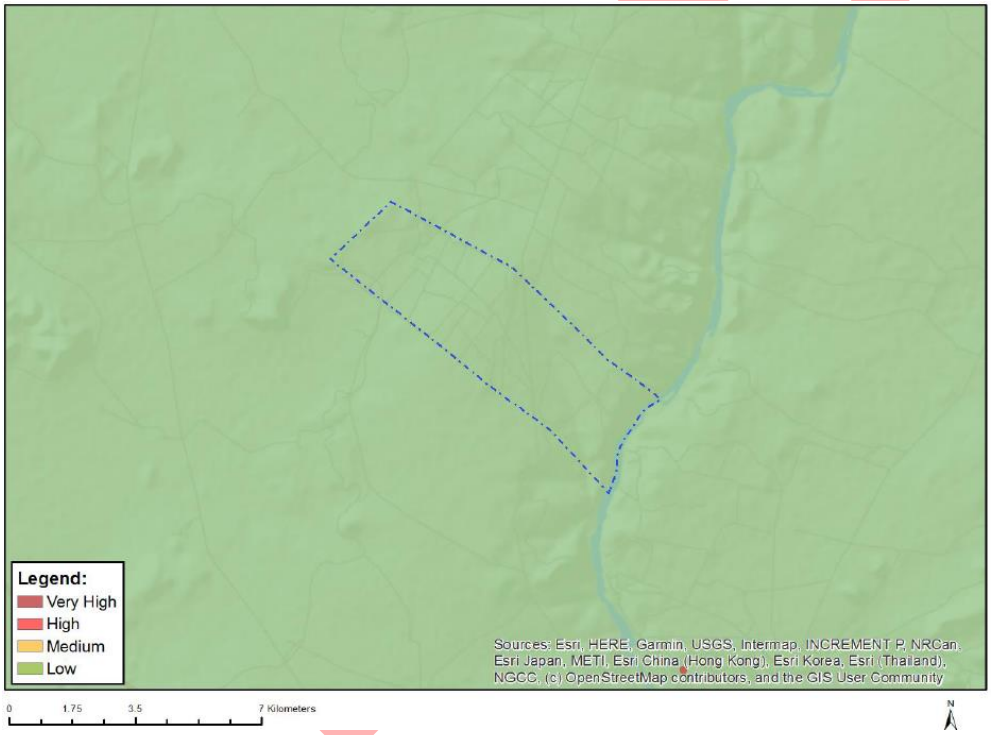


Figure 21: Archaeological and Cultural Heritage Combined Sensitivity

According to the preliminary Cultural Heritage Impact Assessment report (**Appendix 12**):

6. Study Approach/Methodology

Geographical information (ESRI shapefiles) on the proposed prospecting areas was supplied by Milnex 189 CC. The most up-to-date Google Earth images and topographic maps were used to indicate the survey area. Topographic maps were sources from the Surveyor General. Please note that all maps are orientated with north facing upwards (unless stated otherwise).

The strategy during this survey was to survey all the farms that form part of the application. A owner (farmer) of the farm accompanied me during the field survey. As a result of a detailed knowledge of the farms certain features and sites were

recorded first. Certain areas were surveyed by conducting intuitive pedestrian (foot) surveys. Extensive mining, prospecting and human habitation have resulted in a landscape with a complex palimpsest of historical layers.

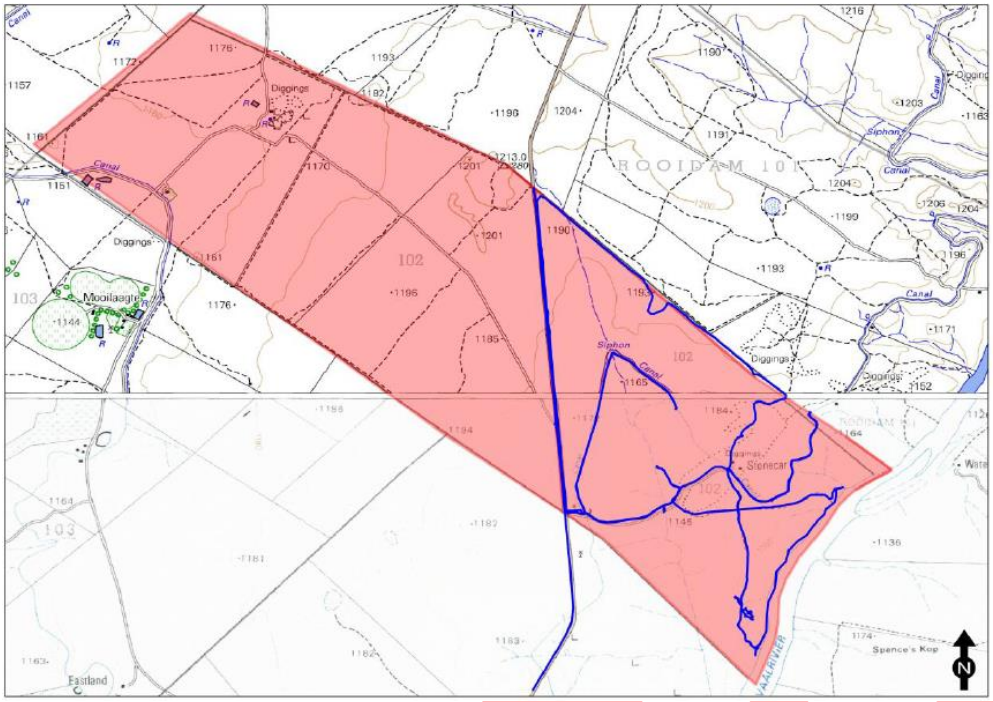


Figure 14: Recorded survey tracks for the project

7.2 Heritage sites

A total of eight heritage sites were recorded during the survey of which six are historical stone-walled structures (Sites 1, 2, 3, 6, 7 and 8), a grave (Site 4) and rock art (engraving (Site 5). The historical sites are probably associated with the late 19th century and early 20th century Korana people and/or farm worker accommodation keeping their own livestock.

No Stone Age or Iron Age settlements, structures, features or assemblages were recorded during the survey.

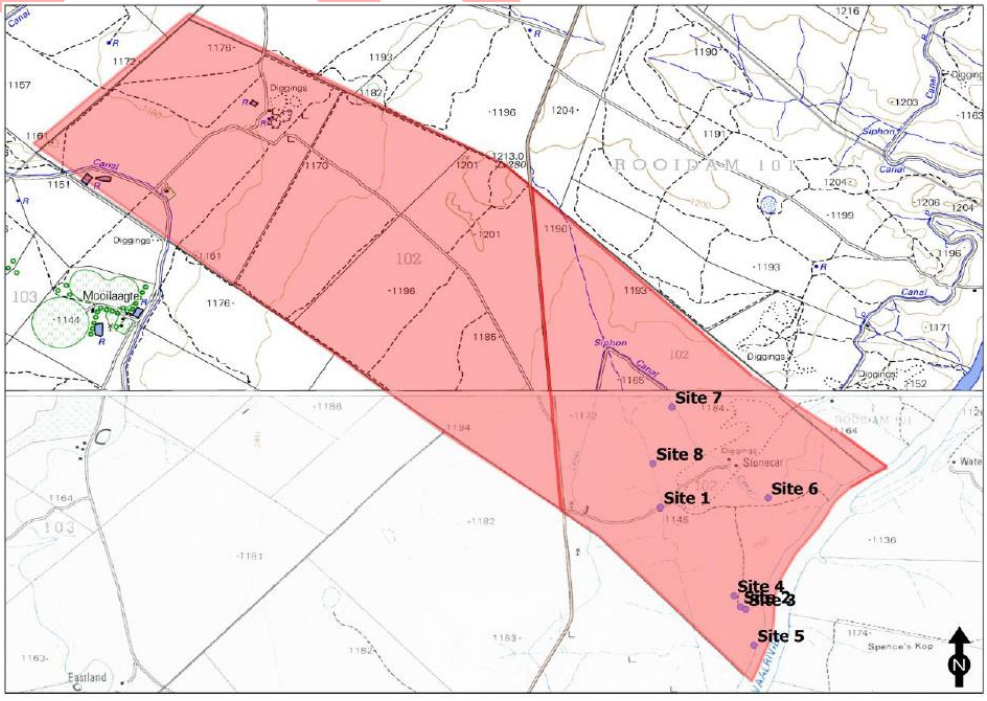


Figure 22: Location of the various recorded heritage sites

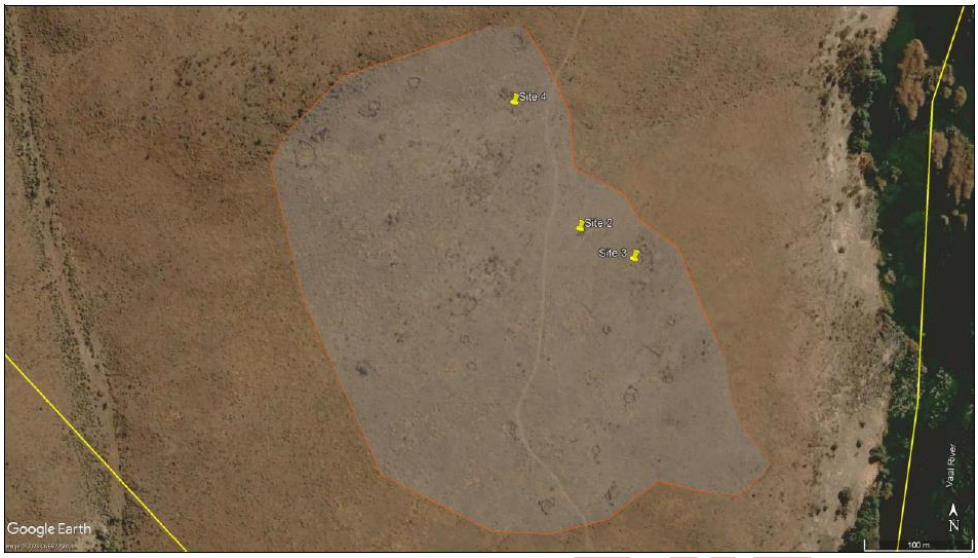


Figure 23: Larger stone-walled settlements as visible on Google Earth Pro (2023)

Locations and Evaluation of Sites

Table 7: Location and evaluation of sites

Site No	Coordinates	Site Type	Field Rating of Significance	Impact	Proposed Mitigation
1	28.261098°S 24.689057°E	Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
2	28.270507°S 24.696751°E	Small Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
3	28.270755°S 24.697259°E	Historical stone-walled settlement and livestock enclosures	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
4	28.269463°S 24.696134°E	Grave and Historical stone-walled livestock enclosure	Generally Protected A High significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
5	28.274193°S 24.698040°E	Rock Art	Local/Grade 3B High significance (mitigation required)	None	• Maintain a buffer zone of 50 metres during prospecting phase
6	28.260196°S 24.699383°E	Historical stone-walled livestock enclosures and houses	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
7	28.251502°S 24.690159°E	Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
8	28.256895°S 24.688358°E	Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase

According to the DFFE Screening Report the proposed area falls mostly within Low Paleontology Theme Sensitivity and small areas within Medium and High sensitivity. Please see colour map under **Appendix 7**.

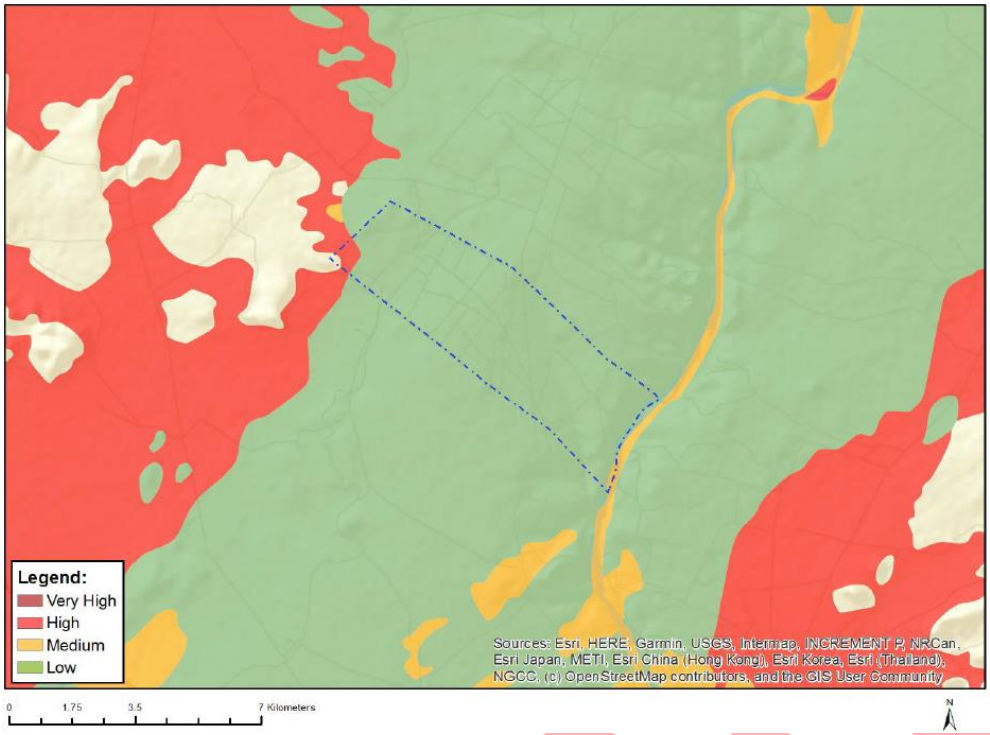


Figure 22: Relative Paleontology Theme Sensitivity

According to the Palaeontological Desktop Assessment (**Appendix 12**):

6 GEOLOGICAL AND PALAEONTOLOGICAL HISTORY

The geology of the proposed Morgenson Prospecting Right Application near Windsorton in the Northern Cape province is depicted on the 1: 250 000 Kimberley 2824 (1993) Geological Map (Council for Geosciences, Pretoria) (Figure 3, Table 3). The proposed development is underlain by Karoo dolerite (Jd, red), the Prins Albert Formation of the Ecca Group (Ppr, beige; Karoo Supergroup) and the Allanridge Formation (Ra, green) of the Ventersdorp Supergroup. The PalaeoMap of the South African Heritage Resources Information System (SAHRIS) indicates that the study area is underlain by sediments with a High (orange, Prins Albert Formation), a Low (blue, Allanridge Formation) and Zero (grey, Karoo Dolerite Suite) Palaeontological Sensitivity (Figure 4) (Almond et al, 2013; SAHRIS website). Updated geology (Council of Geosciences, Pretoria) indicates that the proposed development is underlain by Allanridge Formation (Ventersdorp Group) as well as the Prins Albert and White Hill Formations of the Ecca Group and Karoo dolerite Suite (Figure 5). The DFFE screening tool for the study areas indicates that the proposed development has a Very High Palaeontological Sensitivity (Figure 6).

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

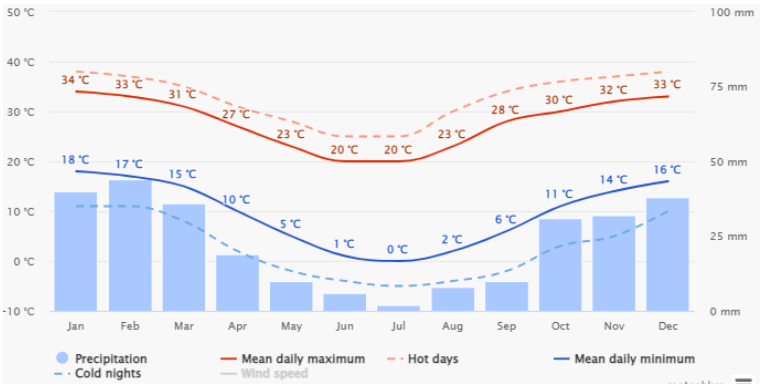
- If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find.
- The person who made the find must immediately report the find to his/her direct supervisor which in turn must report 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.
- 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.

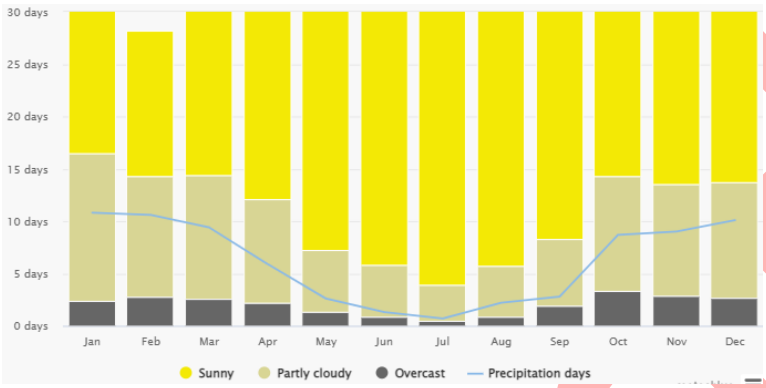
CLIMATE

The meteoblue climate diagrams are based on 30 years of hourly weather model simulations and available for every place on Earth. They give good indications of typical climate patterns and expected conditions (temperature, precipitation, sunshine and wind). The simulated weather data have a spatial resolution of approximately 30 km and may not reproduce all local weather effects, such as thunderstorms, local winds, or tornadoes, and local differences as they occur in urban, mountainous, or coastal areas.

Average temperatures and precipitation

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Windsorton. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years

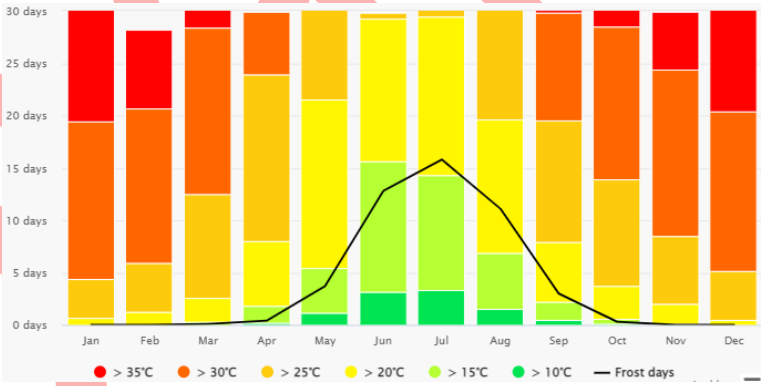


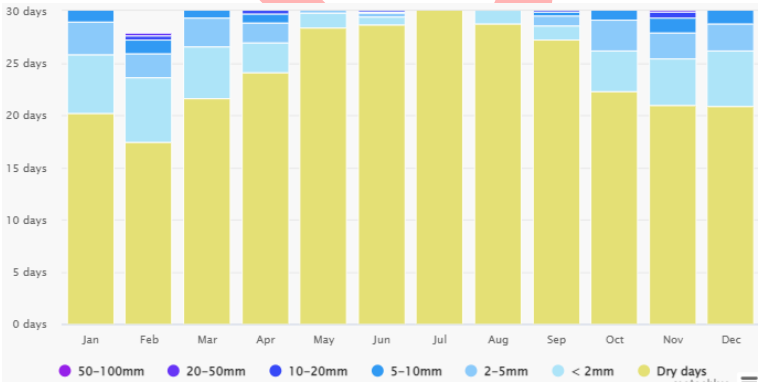


Cloudy, sunny, and precipitation days

Maximum temperatures

The maximum temperature diagram for Windsorton displays how many days per month reach certain temperatures.



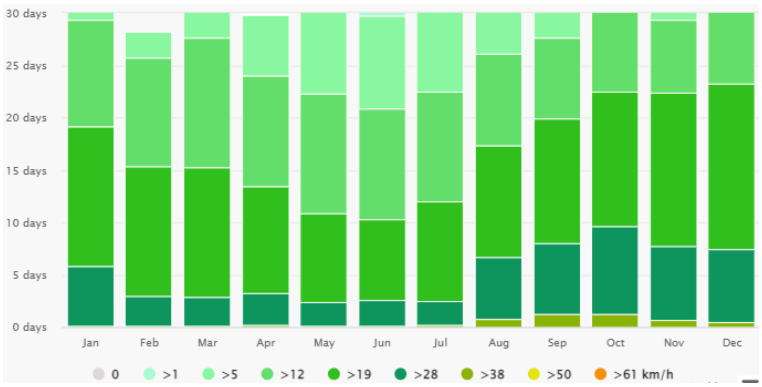


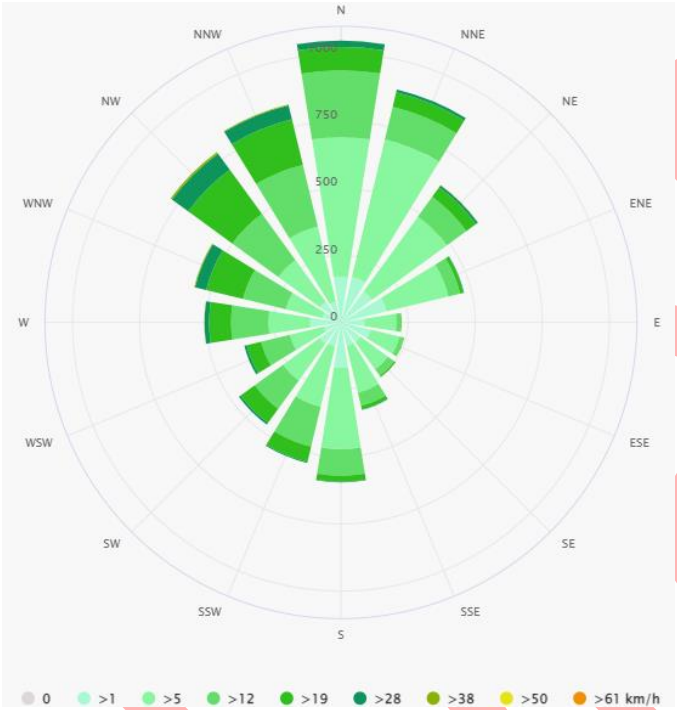
Precipitation amounts

The precipitation diagram for Windsorton shows on how many days per month, certain precipitation amounts are reached.

Wind speed

The diagram for Windsorton shows the days per month, during which the wind reaches a certain speed.





Wind rose

The wind rose for Windsorton shows how many hours per year the wind blows from the indicated direction

(b) Description of the current land uses.

According to the map below (**Figure 23** and **Figure 24**), the proposed area is largely covered by Grasslands with some areas in Forested Land, Mines & Quarries and Waterbodies.

The google earth (**Figure 25**) map shows the area is mostly natural, roads travers the proposed area and there is disturbance from previous mining related activities.

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

According to GIS data, the majority of the study area is comprised of natural grassland with some limited areas of forested land and mines & quarries. The southernmost border if the application area is comprised of a natural waterbody (Vaalriver).
Land use on site and the surrounding areas is very limited, with some of the surrounding areas having been converted to extraction sites, fallow lands, and temporary crops. The only land use within the application area is some extraction sites. Most of the application area is unmodified and natural.

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

All infrastructure will be temporary and/or mobile.

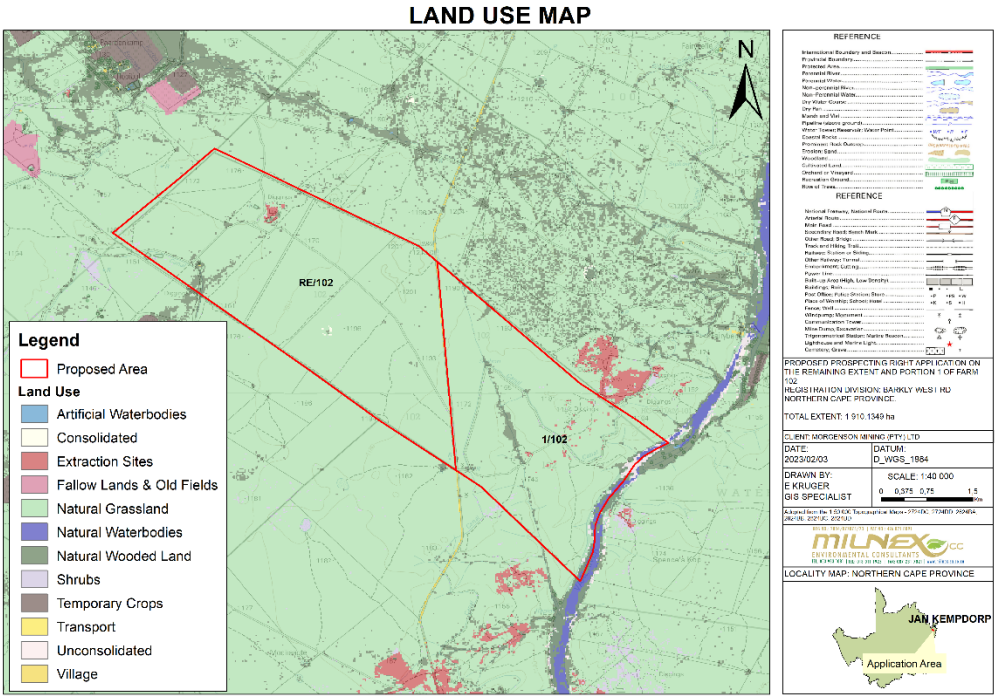


Figure 23: Land use map associated with study site and surrounding areas.

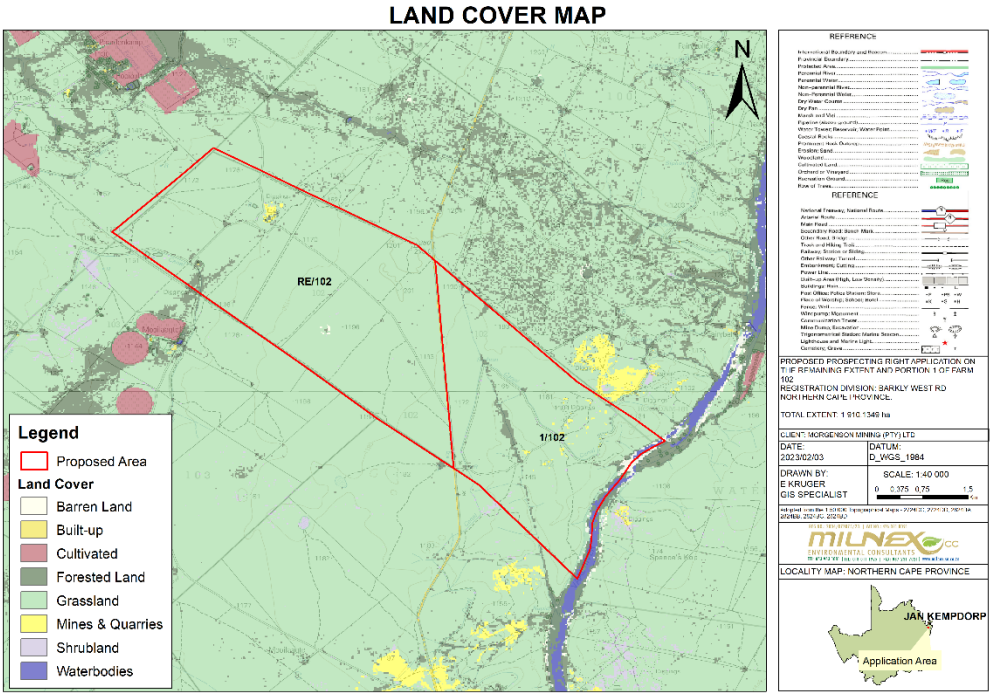


Figure 24: Landcover map associated with study site and surrounding areas.

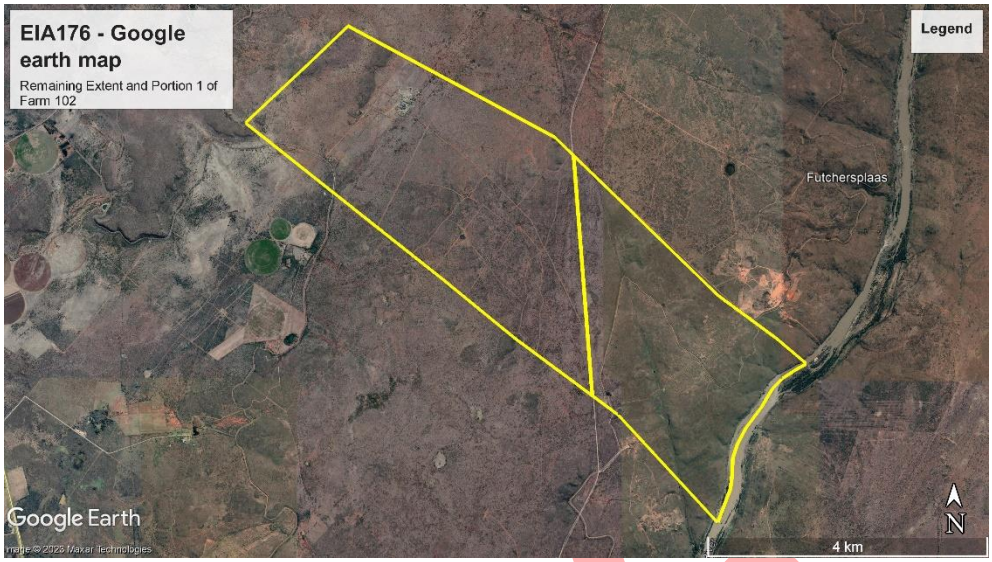


Figure 25: Google earth map

v) The 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;

Please see heading J) AN ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK,, for the impacts identified and their assessment.

vi) the 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 results 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) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

ACTIVITY	PHASE	POTENTIAL NEGATIVE IMPACTS
Site preparation Site Clearance, establishing construction area	Construction Operation Decommissioning	Physical destruction and disturbance of: • Biodiversity (thicket is mostly invasive tree species and area is already disturbed by agricultural activities) • Air pollution • Disturbing noise • Visual impacts
Earthworks	Construction Operation Decommissioning	Excavations: • Loss of soil resources and land capability • Physical destruction and disturbance of biodiversity (thicket is mostly invasive tree species and area is already disturbed by agricultural activities) • Possible pollution of surface water resources • Possible alteration of natural drainage patterns • Possible contamination of groundwater • Air pollution • Disturbing noise • Visual impacts
Civil works Erection of structures, concrete work, steel work, electrical installation, establishing pipelines (if any)	Construction Operation Decommissioning	• Loss of mineral reserves • Hazardous structures/excavations/surface subsidence • Loss of soil resources and land capability • Possible pollution of surface water resources • Possible contamination of groundwater • Air pollution • Disturbing noise • Visual impacts
Open-pit mining Mining, load, and hauling	Construction Operation	• Loss of mineral resources • Loss of soil resources and land capability Physical destruction and disturbance of: • Biodiversity (thicket is mostly invasive tree species and area is already disturbed by agricultural activities)

		• Air pollution • Disturbing noise • Visual impacts • Possible pollution of surface water resources • Possible contamination of groundwater • Dewatering impacts
Waste rock management Storage, stockpile or final disposal	Operation Decommissioning Closure (final land form)	• Loss of soil resources and land capability • Disturbance of biodiversity (thicket is mostly invasive tree species and area is already disturbed by agricultural activities) • Possible pollution of surface water resources • Possible contamination of groundwater • Air pollution • Disturbing noise • Negative landscape and visual impact
Dirty water management Collection, storage of dirty water for re-use, recycling	Construction Operation Decommissioning	• Possible pollution of surface water resources • Possible contamination of groundwater • Disturbing noise
Stormwater management Stormwater channels and berms, collection of dirty water, storage for re- use	Construction Operation Decommissioning	• Possible alteration of drainage patterns • Possible pollution of surface water resources • Possible contamination of groundwater
Transport systems Use of access points, road transport to and from site for employees and supplies, movement within site boundary (haul roads, conveyors, pipelines), taxi areas	Construction Operation Decommissioning	• Disturbance of biodiversity • Noise • Traffic impacts • Visual impacts
Storage and maintenance services/ facilities Washing vehicles and machinery, storage and handling non-process materials	Construction Operation Decommissioning	• Possible pollution of surface water resources • Possible contamination of groundwater resulting from hydrocarbon spills and soil erosion • Disturbing noise
Demolition Dismantling, demolition, removal of equipment	Operation (as part of maintenance) Decommissioning	• Hazardous structures (e.g., fuel tanks) • Loss of soil resources and land capability • Disturbance of biodiversity • Air pollution • Disturbing noise • Visual impacts
Non-mineralized waste management Transportation of waste materials to waste facility	Construction Operation Decommissioning Closure (limited)	• Pollution if not managed and stored properly
Rehabilitation Replacing soil, slope stabilization, landscaping, re-vegetation, restoration	Construction Operation Decommissioning Closure	• Disturbance of biodiversity • Alteration of natural drainage patterns • Contamination of groundwater • Air pollution • Visual impacts

ACTIVITY	PHASE	POTENTIAL POSITIVE IMPACTS
Job creation	Construction Operation	• Temporary employment and other economic benefits
Maintenance and aftercare Inspection and maintenance of remaining facilities and rehabilitated areas	Closure	• Re-establishment of biodiversity

viii) the possible mitigation measures that could be applied and level of residual 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).

Adverse environmental associated with the prospecting activity have been identified through the Scoping & EIR process. Mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B must be implemented in order to minimise any potential impacts.

All comments received during the review period of the EIR report, as well as response provided is captured and recorded within the Comments and Response Report and will be attached to the final EIR.

POTENTIAL IMPACT	POSSIBLE MITIGATION MEASURES
Influx of persons (job seekers)	• Establish and maintain site security measures • Control site and facility access
Hazardous waste pollution	• Implement hazardous waste, dirty water and mineralised and non- mineralised waste management procedures
Loss of soil resources and land capability through physical disturbance	• Implementation of a soil management plan • Limit disturbance of soil to what is necessary • Stripping, storing, maintenance and replacement of topsoil in accordance with soil management procedures
Physical destruction or disturbance of biodiversity	• Implement a biodiversity management plan • Restrict project footprint • Provide alternative habitat (where appropriate and necessary) • Implement a monitoring programme • Rehabilitate disturbed areas • Prevention of the killing of animal species and harvesting of plant species • Implementation of dust control measures • Pollution prevention measures (water, soil etc.) • Prevention of the disturbance of ecosystems as far as possible.
Surface water pollution	• Appropriate design of polluting facilities and pollution prevention facilities • Implement and maintain stormwater controls that meet regulatory requirements • Implement a monitoring programme (water use, process water quality, rainfall-related discharge quality) • Implement emergency response • Authorise all water uses as defined in the NWA
Groundwater contamination	• Appropriate design of polluting facilities (by qualified person) • Correct handling of hazardous wastes, mineralised and non-mineralised wastes • Compensation for loss • Implementation of a monitoring programme

Dewatering	• Authorise all water uses as defined in the NWA Compliance with relevant license requirements
Air pollution	• Implementation of air quality management plan • Implementation of an air quality monitoring plan • Control dust plumes • Implementation of an air complaints procedure • Maintenance of abatement equipment Implement an emergency response
Noise pollution	• Maintenance of equipment and machinery in good working order • Equip machinery with silencers • Construction of noise attenuation measures (if complaints received) • Implementation of noise monitoring programme (if complaints received)
Visual impacts	• Limit the clearing of vegetation as far as possible • Limit the emissions of visual dust plumes • Use of screening berms Concurrent rehabilitation • Painting infrastructure to compliment the surrounding environment Implementation of a closure plan • Management through care and aftercare
Traffic increases	• Implement speed allaying measures where appropriate, e.g. speed humps where necessary • Education and awareness training of workers • Enforce strict speed limits on mine access roads
Heritage and cultural	• Avoid heritage and cultural resources as far as practically possible • Apply for the relevant permits to remove or destroy heritage sites (if applicable) • Exhumation and relocation of graves according to legal requirements (if applicable) • Mark remaining heritage sites on plan
Economic impact	• Hire people from closest communities as far as practically possible • Local procurement of goods and services as far as practically possible • Compensation for loss of land use • Closure planning will consider skills, economic consideration, and the needs of future farming
Land uses	• Implementation of EMPr commitments that focus on environmental and social impacts • Take necessary steps to prevent negative impact on surrounding land • Compensation for loss • Closure planning to incorporate measures to achieve future land use plans

ix) if no alternative development [location] footprints for the activity were investigated, the motivation for not considering such; and

As discussed in the previous section, based on outcomes of previous studies in the vicinity of the proposed site, high volumes of Diamonds Alluvial (DA) and Diamonds General (D) near Windsorton on the Remaining Extent and Portion 1 of Farm 102, Registration Division: Barkley West, Northern Cape province, is expected.

x) **a concluding statement indicating the location of the preferred alternative development [location] footprint within the approved site as contemplated in the accepted scoping report;**
(Provide a statement motivating the final site layout that is proposed)

The layout follows the limitations of the site and aspects such as, roads, site offices and workshop area as well as fencing. However, the exact layout will only be determined after a formal site visit and desktop study, which will only occur during Phase 1 and Phase 2 of the PWP and only if the project is approved,

I. **A FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS THE ACTIVITY AND ASSOCIATED STRUCTURES AND INFRASTRUCTURE WILL IMPOSE ON THE PREFERRED [LOCATION] DEVELOPMENT FOOTPRINT ON THE APPROVED SITE**
(AS CONTEMPLATED IN THE ACCEPTED SCOPING REPORT THROUGH THE LIFE OF THE ACTIVITY, INCLUDING—.)

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

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 Vaal River boarders the proposed area and according to the wetland areas map the Orange River is as Channelled Valley-Bottom Wetland, other wetland on the proposed area includes Depressions and Seeps.
II. A conservation or open space area		X		

III. An area that is of cultural importance			×	According to the DFFE Screening Report the proposed area falls within low Archaeological and Cultural Heritage Theme Sensitivity. Please see colour map under. (**Appendix 7**).
IV. Site of geological significance			×	According to the DFFE Screening Report the proposed area falls mostly within Low Paleontology Theme Sensitivity and small areas within Medium and High sensitivity. Please see colour map under **Appendix 7**.
V. Areas of outstanding natural beauty			×	
VI. Highly productive agricultural land		×		According to the Land Capability map the proposed area falls within land capability Class 5 (**Appendix 5**). The proposed area is mostly covered in natural grasslands with little disturbance. According to the DFFE Screening Report the Agriculture theme sensitivity of the proposed area fall within Low and Medium sensitivity (**Appendix 7**).
VII. Floodplain		×		The Vaal River boarders the proposed area and according to the wetland areas map the Orange River is as Channelled Valley-Bottom Wetland, other wetland on the proposed area includes Depressions and Seeps.
VIII. Indigenous forest			×	According to the map below (**Figure 23** and **Figure 24**), the proposed area is largely covered by Grasslands with some areas in Forested Land, Mines & Quarries and Waterbodies. The google earth (**Figure 25**) map shows the area is mostly natural, roads travers the proposed area and there is disturbance from previous mining related activities.
IX. Grass land	×			According to the map below (**Figure 23** and **Figure 24**), the proposed area is largely covered by Grasslands with some areas in Forested Land, Mines & Quarries and Waterbodies. The google earth (**Figure 25**) map shows the area is mostly natural, roads travers the proposed area and there is disturbance from previous mining related activities.
X. Bird nesting sites		×		According to the Important Bird Areas map (**Appendix 7**) the proposed area does not fall within an Important Bird Area (IBAs).
XI. Red data species			×	According to the map below (**Figure 23** and **Figure 24**), the proposed area is largely covered by Grasslands with some areas in Forested Land, Mines & Quarries and Waterbodies. The google earth (**Figure 25**) map shows the area is mostly natural, roads travers the proposed area and there is disturbance from previous mining related activities.
XII. Tourist resort			×	Google does not show any tourist resort in the area.
2. Will the project potentially result in potential?				
I. Removal of people		×		None.
II. Visual Impacts	×			Visual impacts 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 R374. There are also various gravel roads traversing the proposed area.
V. Risk to human or valuable ecosystems due to explosion/fire/ discharge of waste into water or air.		✕		None.
VI. Accumulation of large workforce (>50 manual workers) into the site.		✕		Employment opportunities will be created during the construction and operational phase of the project.
VII. Utilisation of significant volumes of local raw materials such as water, wood etc.	✕			Water will be used during the washing of the gravel and for dust suppression. The amount of water for the pans will be 68 000 L/hour from which 30% is re-used.
VIII. Job creation	✕			Employment opportunities will be created during the construction and operational phase of the project.
IX. Traffic generation		✕		None.
X. Soil erosion	✕			Only areas earmarked for mining will be cleared. prospecting will be phased and the topsoil stockpiled separately. Concurrent rehabilitation will take place.
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 Vaal River. According to the wetland areas map the Vaal River is as Channelled Valley-Bottom Wetland, other wetland in the area includes Depressions and Seeps.
II. A conservation or open space area		✕		
III. An area that is of cultural importance			✕	According to the DFFE Screening Report the surrounding area falls within low Archaeological and Cultural Heritage Theme Sensitivity. Please see colour map under. (**Appendix 7**).
IV. A site of geological significance			✕	According to the DFFE Screening Report the surrounding area falls within Low, Medium and High Paleontology Theme Sensitivity. Please see colour map under **Appendix 7**.
V. An area of outstanding natural beauty		✕		
VI. Highly productive agricultural land		✕		According to the Land Capability map the surrounding area falls within land capability Class 5 (**Appendix 5**). The surrounding area have few central pivot irrigation systems for crop production.
VII. A tourist resort			✕	
VIII. A formal or informal settlement	✕			Windsorton is approximately 7km South from the proposed area.

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.

ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;

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									
Listing Notice 1, (GNR 327), Activity 9: *"The development of infrastructure exceeding 1 000 meters in length for the bulk transportation of water or storm water –* *(i) with an internal diameter of 0,36 metres or more: or* *(ii) with a peak throughput of 120 litres per second or more"* ***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 a watercourse;* **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."* **Listing Notice 3 (GNR 324), Activity 4:** *The development of a road wider than 4 metres with a reserve less than 13,5 metres.* ***(g) Northern Cape (ii)*** *Outside urban areas;* ***(ee)*** *Critical Biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority* **Listing Notice 3 GNR 324, Activity 10:** *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.* ***(g) Northern Cape (iii).*** *Outside urban areas:* ***(ee)*** *Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* **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)*** *Critical Biodiversity Areas as identified in biodiversity plans ".*	<u>Site clearing and preparation</u> Areas earmarked for prospecting will need to be cleared, topsoil will be stockpiled separately.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Loss or fragmentation of indigenous natural vegetation. • Loss of sensitive species. • Loss or fragmentation of habitats.		-	S	Yes	-
			Air	• Air pollution due to the increase of traffic. • Dust from mining/prospecting activities	-		M	Yes	-
			Soil	• Soil degradation, including erosion. • Loss of topsoil. • Disturbance of soils and existing land use (soil compaction).	-	-	S	Yes	-
			Geology	• It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa.	-		S	Yes	-
			Existing services infrastructure	• 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	• Pollution due to construction vehicles.	-		S	Yes	-
			Surface water	• 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	• Job creation. • Business opportunities. • Skills development.		+	S	Yes	-
			Visual landscape	• Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility.	-		L	Yes	-
			Traffic volumes	• Increase in construction vehicles.	-		S	Yes	-
			Health & Safety	• Air/dust pollution. • Road safety. • Increased risk of veld fires.		-	S	Yes	-
			Noise levels	• The generation of noise as a result of construction vehicles, the use of machinery such as drills, excavators, dumper trucks and people working on the site.	-		L	Yes	-
			Tourism industry	• Since there no tourism facilities in close proximity to the site, the construction activities will not have an impact on tourism in the area.	-		M	Yes	-

			Heritage resources	• 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									
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 a watercourse;* **Listing Notice 1 (GNR 327), Activity 20 (Amended GNR 517: 2021):** *"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, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the prospecting right"* **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."* **Listing Notice 2 (GNR 325), Activity 19 (Amended GNR 517: 2021):** *"The removal and disposal of minerals which requires permission contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity as contained in this Listing Notice, Listing Notice 1 of 2014 or in Listing Notice 3 of 2014, required to exercise the permission.* **Listing Notice 3 (GNR 324), Activity 4:** *The development of a road wider than 4 metres with a reserve less than 13,5 metres.* ***(g) Northern Cape (ii)*** *Outside urban areas;* ***(ee)*** *Critical Biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority* **Listing Notice 3 GNR 324, Activity 10:** *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.* ***(g) Northern Cape (iii).*** *Outside urban areas:* ***(ee)*** *Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;* **Listing Notice 3 (GNR 324), Activity 12:** *"The clearance of an area of 300 square metres or more of indigenous vegetation.* ***(g)***	The key components of the proposed project are described below: • <u>Supporting Infrastructure</u> - 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. • <u>Roads</u> – Access will be obtained from existing gravel roads off the R374. There are also various gravel roads traversing the proposed area. • <u>Fencing</u> - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Fragmentation of habitats. • Establishment and spread of declared weeds and alien invader plants (operations).		-	L	Yes	-
			Air quality	• Air pollution due to the mining / prospecting activity and transport of the gravel to the designated areas.	-		S	Yes	-
			Soil	• Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Loss of agricultural potential (medium - high significance relative to agricultural potential of the site).	-		L	Yes	-
			Geology	• 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	• 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	• 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	• 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	-
			Local unemployment rate	• Job creation. Security guards will be required for 24 hours every day of the week. • Skills development.		+	L	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Visual landscape	• The proposed portions are used for livestock grazing and cultivation which will still take place simultaneously with the prospecting activity, however this depends on the location of the activity.	-		L	Yes	-
			Traffic volumes	• Increase in vehicles collecting gravel for distribution.	-		S	Yes	-

Northern Cape (ii) *Critical Biodiversity Areas as identified in biodiversity plans ".*			Health & Safety	• Air/dust pollution. • Road safety.	-		S	Yes	-
			Noise levels	• The proposed development will result in noise pollution during the operational phase.	-		M	Yes	-
			Tourism industry	• Since there no tourism facilities in close proximity to the site, the operational activities will not have an impact on tourism in the area.	-		M	Yes	-
			Heritage resources	• 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									
-	Mine closure During the mine closure the Mine and its associated infrastructure will be dismantled. Rehabilitation of biophysical environment The biophysical environment will be rehabilitated.	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	• Re-vegetation of exposed soil surfaces to ensure no erosion in these areas.		+	L	Yes	-
			Air quality	• Air pollution due to the increase of traffic of construction vehicles.	-		S	Yes	-
			Soil	• Backfilling of all voids • Placing of topsoil on backfill		+	L	Yes	-
			Geology	• 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	• 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	• Pollution due to construction vehicles.	-		S	Yes	-
			Surface water	• 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	• Loss of employment.	-		L	Yes	-
			Visual landscape	• Potential visual impact on visual receptors in close proximity to proposed facility.	-		S	Yes	-
			Traffic volumes	• Increase in construction vehicles.	-		S	Yes	-
			Health & Safety	• 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	• The generation of noise as a result of construction vehicles, the use of machinery and people working on the site.	-		S	Yes	-
			Tourism industry	• Since there no tourism facilities in close proximity to the site, the decommissioning activities will not have an impact on tourism in the area.	+		S	Yes	-
			Heritage resources	• It is not foreseen that the decommissioning phase will impact on any heritage resources.	N/A	N/A	N/A	N/A	-

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

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

(i) cumulative impacts;
(ii) the nature, significance and consequences of the impact and risk;
(iii) the extent and duration of the impact and risk;
(iv) the probability of the impact and risk occurring;
(v) the degree to which the impact and risk can be reversed;
(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and
(vii) the degree to which the impact and risk can be mitigated;

Significance of potential impacts

The following sections present the outcome of the significance rating exercise. The results suggest that almost none of the key issues identified as part of the EIR process had a negative high environmental significance. Instead the overall score indicate a low environmental significance score.

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 indigenous natural fauna and flora, loss or fragmentation of 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:

Impacts on the Ecological aspects:

According to the Terrestrial Biodiversity and Wetland Impact Assessment:

The prospecting activities will result in a disturbance of the wetland systems and vegetation habitats during the construction, operation, and decommissioning phases. During rainfall events, the wetland areas will receive an influx of sediment and possible toxic pollutants. See Table 23 below for a list of expected impacts.

Table 21: Summary of potential

Construction Phase	Operational Phase	Decommissioning Phase
Changing the physical structure within a water resource (habitat)	Changing the physical structure within a water resource (habitat)	Loss of terrestrial habitat
Alteration of the amount of sediment entering the water resource and associated change in turbidity	Alteration of the amount of sediment entering the water resource and associated change in turbidity	Changing the physical structure within a water resource (habitat)
Alteration of water quality (during rainfall events)	Alteration of water quality (during rainfall events)	Introduction and spread of alien vegetation
Loss of terrestrial habitat	Loss of terrestrial habitat	
Loss of Aquatic Biota	Loss of Aquatic Biota	
Loss of Terrestrial Fauna	Loss of Terrestrial Fauna	
Loss of Terrestrial Flora	Loss of Terrestrial Flora	
Introduction and spread of alien vegetation	Introduction and spread of alien vegetation	

According to the Terrestrial Biodiversity and Wetland Impact Assessment:

Table 25: Construction Phase Impact Assessment

Potential Environmental Impact	Environmental Impact Before Mitigation						Environmental Impact After Mitigation					
	Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration	Significance	Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration	Significance
Changing the physical structure within a water resource (habitat)	5	5	5	1	5	110 High	2	4	2	2	3	42 Low
Alteration of the amount of sediment entering the water resource and associated change in turbidity	5	5	5	1	5	110 High	3	4	2	3	2	49 Low
Alteration of water quality (during rainfall events)	5	5	5	1	5	110 High	3	4	1	3	2	42 Low
Loss of terrestrial habitat	5	5	5	1	5	110 High	3	4	2	2	2	42 Low
Loss of Aquatic Biota	5	5	5	1	5	110 High	2	3	1	2	1	20 Very Low
Loss of Terrestrial Fauna	5	5	5	1	5	110 High	2	3	1	1	1	15 Very Low
Loss of Terrestrial Flora	5	5	5	1	5	110 High	3	4	2	1	1	28 Low
Introduction and spread of alien vegetation	3	3	3	2	5	60 Medium - Low	3	3	2	2	2	36 Low

Specialist recommended mitigation measure are included in the Environmental Management Programme (EMPr) under Part B of this report.

- 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	Possible (2)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Significant (3)	Marginal (2)
Cumulative impact	Medium cumulative impact (3).	
Significance	**Negative Medium (39)**	**Negative Low (20)**
Can impacts be mitigated?	The following mitigation or management measures are provided: • 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. 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. • 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. Section (f) of the EMPr also provide mitigation measures related to topsoil management.	

- 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. The erosion risk is low to medium due to a low and steep slope gradients and low to moderate erodibility of the soils. However, soil erosion may have a negative impact on wetlands in the proposed area.

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	Medium term (2)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Marginal (2)	Marginal (2)
Cumulative impact	Medium cumulative impact (2).	
Significance	**Negative Medium (36)**	**Negative low (22)**
Can impacts be mitigated?	The following mitigation or management measures are provided: 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. 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.	

- 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 back actors and people working on the site. The noise impact is likely to be significant; but activities should be limited to normal working days and hours.

The community and town of Windsorton is approximately 5km South from the proposed area.

Community Noise

Community noise impacts should not exceed the levels presented in Table below of South African Standards or result in a maximum increase above background levels of 3 dBA at the nearest receptor location off-site.

- The noise levels are relevant to noise impacts beyond the property boundary of the facility. However, noise prevention and mitigation measures should be applied where predicted or measured noise impacts from a project facility or operations exceed the applicable noise level guideline at the most sensitive point of reception. A point of reception or receptor may be defined as any point on the premises occupied by persons where extraneous noise and/or vibration are received.
- South African National Standard (SANS) 10103 (2008) provides a guideline for estimating community response to an increase in the general ambient noise level caused by intruding noise.

SITE	WHO / IFC LAEQ (1H) DBA		SOUTH AFRICAN STANDARDS	
	DAY 07:00 – 19:00	NIGHT 19:00 – 07:00	DAY 07:00 – 19:00	NIGHT 19:00 – 07:00
Residential; Institutional; Educational	55	45	55	45
Industrial, Commercial	70	70	70	60

The possible noise can however be controlled by means of approved acoustic screening measures, state of the art equipment, proper noise management principles, compliance to the Local Noise Regulations, and the International Finance Corporation's Environmental Health and Safety Guidelines.

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 (3)
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	The impact would result in negligible to no cumulative effects (1).	
Significance	**Negative low (18)**	**Negative low (9)**
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. The applicant will need to ensure that general waste is appropriately disposed of i.e. taken to the nearest licensed landfill.

  Sanitation for mine employees will consists of sufficient ablution facilities by means of portable toilets serviced by one septic tank which is pumped out regularly of chemical toilets which is pumped out regularly. No further sanitation infrastructure is envisioned for the proposed prospecting activities.

  No pit latrines, French drain systems or soak away systems shall be allowed.

Generation of waste	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local/district (2)	Local/district (2)
Probability	Definite (4)	Definite (4)
Duration	Short term (1)	Short term (1)
Magnitude	Medium (2)	Low (1)
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) - 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. However, this is smalls scale mining and impact is expected to be low.	
Significance	**Negative low (26)**	**Negative low (13)**
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.	

- Groundwater: Prospecting activities may adversely affect possible shallow groundwater and contaminate the quality of the local water resource and its beneficial use. Potential impacts may be from contamination from hydrocarbon spills.

Groundwater	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local/district (2)	Local/district (2)
Probability	Definite (4)	Definite (4)
Duration	Short term (1)	Short term (1)
Magnitude	High (3)	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	**Negative medium (39)**	**Negative low (26)**
Can impacts be mitigated?	• All vehicles must be regularly inspected for leaks. • Re-fuelling must take place on a sealed surface area to prevent hydrocarbon pollution. • All spills should be cleaned up immediately and disposed of. • A credible company should remove used oil from the workshops; • 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. • An emergency spill procedure should be developed and implemented.	

- **Impacts on cultural heritage objects:**

According to the preliminary Cultural Heritage Impact Assessment report (**Appendix 12**):

A total of eight heritage sites were recorded during the survey of which six are historical stone-walled structures (Sites 1, 2, 3, 6, 7 and 8), a grave (Site 4) and rock art (engraving (Site 5). The historical sites are probably associated with the late 19th century and early 20th century Korana people and/or farm worker accommodation keeping their own livestock.

No Stone Age or Iron Age settlements, structures, features or assemblages were recorded during the survey.
It is well known that Late Iron Age stone-walled settlements do not usually occur in open low-lying grasslands. The well-known Korana settlements of Chief Mossweu are located near Mamusa Hill (further east near Schweizer-Reneke) and other Tswana settlement (Rolong and Tlhaping) occur further north and east of the survey area.

It is therefore recommended, from a cultural heritage perspective that the proposed prospecting activities may proceed.

Nature: Six historical stone walled enclosures, a grave and a rock art site.		
	Without mitigation	**With mitigation**
Pre-construction & Construction Phase		
Probability	Definite (5)	Very Improbable (1)
Duration	Permanent (5)	Short term (2)
Extent	Limited to the site (1)	Limited to the site (1)
Magnitude	Very High (10)	Minor (2)
Significance of Impact	**80 (High)**	**5 (Low)**
Status (positive or negative)	Negative	Positive
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	None
Cumulative impacts and indirect impacts	Prospecting activities result in extensive heavy vehicle traffic, extraction of deposits, movements of heavy machinery which culminate in vibrations and dust which will also indirectly affect the heritage remains.	
Can impacts be mitigated?	Yes, buffer zones are recommended (50 metres)	

Also, please note:
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)).

- Impact on Fossil heritage

According to the Palaeontological Desktop Assessment (**Appendix 12**):

Loss of fossil heritage will be a negative impact. Only the site will be affected by the proposed development. The expected duration of the impact is assessed as potentially permanent to long term. In the absence of mitigation procedures, the damage or destruction of any palaeontological materials will be permanent. Impacts on palaeontological heritage during the construction phase could potentially occur.

Table 2:Summary of Impacts

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

	Extent	Duration	Magnitude	Reversibility	Irreplicable loss	Cumulative effect	Impact
Pre-Mitigation	1	4	2	4	4	2	30
Post-Mitigation	1	4	1	4	4	2	15

The following procedure will only be followed if fossils are uncovered during the excavation phase of the development.

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".

1.2.1 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.
- 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.

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 roads and create dust and safety impacts for other road users in the area.

The movement of heavy vehicles during the clearance of vegetation and topsoil has 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 R374. The volume of traffic along this road is low but the movement of heavy vehicles along this road is likely to damage the road surface and impact on few 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	Probable (3)	Probable (3)
Duration	Short term (1)	Short term (1)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (1)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3). If damage to roads is not repaired then this will affect the farming activities in the area and result in higher maintenance costs for vehicles of local farmers and other road users. The costs will be borne by road users who were no responsible for the damage.	

Significance	**Negative medium (39)**	**Negative low (22)**
Can impacts be mitigated?	The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include: • The contractor must ensure that damage caused by construction on the roads are repaired. 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. Also refer section (f) of the EMPr. For mitigation measures related to traffic.	

- Risk to safety, livestock and farm infrastructure - The presence on and movement of workers on and off the site poses a potential safety threat to local famer's and farm workers in the vicinity of the site threat.

  In addition, farm infrastructure, such as fences and gates, may be damaged and stock losses may also result from gates being left open and/or fences being damaged or stock theft linked either directly or indirectly to the presence of farm workers on the site.

Risk to safety, livestock and farm infrastructure	**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	Long term (3)	Short term (1)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Completely reversible (1)
Irreplaceable loss of resources	Significant resource (3)	Marginal resource (2)
Cumulative impact	Medium cumulative effects (3), provided losses are compensated for.	
Significance	**Negative High (51)**	**Negative low (22)**
Can impacts be mitigated?	Key mitigation measures include: • **Morgenson Mining (Pty) Ltd** should enter into an agreement with the 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 **Morgenson Mining (Pty) Ltd** 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;	

	• **Morgenson Mining (Pty) Ltd** should hold contractors liable for compensating farmers in full for any stock losses and/or damage to farm 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 loses 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 **Morgenson Mining (Pty) Ltd** 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 **Morgenson Mining (Pty) Ltd** must ensure that construction workers who are found guilty of trespassing, stealing livestock and/or damaging farm 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; • The housing of construction workers on the site should be strictly limited to security personnel (if any).

- 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 and farmsteads in the area.

  In the process, farm 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 construction phase.

Increased risk of veld fires	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Region (3)	Local (2)
Probability	Probable (3)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Irreversible (4)	Partly reversible (1)
Irreplaceable loss of resources	Significant loss of resource (3)	No loss of resource (1)
Cumulative impact	Negligible cumulative effects (1), provided losses are compensated for.	
Significance	**Negative medium (48)**	**Negative low (18)**
Can impacts be mitigated?	The mitigation measures include: • 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 an prospecting area and the impacts are generally associated with 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:

Impacts on the Ecological aspects:

According to the Terrestrial Biodiversity and Wetland Impact Assessment:

The prospecting activities will result in a disturbance of the wetland systems and vegetation habitats during the construction, operation, and decommissioning phases. During rainfall events, the wetland areas will receive an influx of sediment and possible toxic pollutants. See Table 23 below for a list of expected impacts.

Table 21: Summary of potential

Construction Phase	Operational Phase	Decommissioning Phase
Changing the physical structure within a water resource (habitat)	Changing the physical structure within a water resource (habitat)	Loss of terrestrial habitat
Alteration of the amount of sediment entering the water resource and associated change in turbidity	Alteration of the amount of sediment entering the water resource and associated change in turbidity	Changing the physical structure within a water resource (habitat)
Alteration of water quality (during rainfall events)	Alteration of water quality (during rainfall events)	Introduction and spread of alien vegetation
Loss of terrestrial habitat	Loss of terrestrial habitat	
Loss of Aquatic Biota	Loss of Aquatic Biota	
Loss of Terrestrial Fauna	Loss of Terrestrial Fauna	
Loss of Terrestrial Flora	Loss of Terrestrial Flora	
Introduction and spread of alien vegetation	Introduction and spread of alien vegetation	

INDIRECT AND CUMULATIVE IMPACTS

- Increased impact on the remaining catchment due to changes in run-off characteristics;

- Habitat changes due to sediment-size changes;
- Loss of floristic and faunistic biodiversity; and
- Changes to in situ chemical parameters (temperature and dissolved oxygen).

According to the Terrestrial Biodiversity and Wetland Impact Assessment:

Table 26: Operational Phase Impact Assessment

Potential Environmental Impact	Environmental Impact Before Mitigation						Environmental Impact After Mitigation					
	Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration	Significance	Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration	Significance
Changing the physical structure within a water resource (habitat)	5	5	5	1	5	110 High	4	4	3	3	3	72 Medium – Low
Alteration of the amount of sediment entering the water resource and associated change in turbidity	5	5	5	1	5	110 High	4	4	2	3	2	56 Medium – Low
Alteration of water quality (during rainfall events)	5	5	5	1	5	110 High	4	4	2	3	2	56 Medium – Low
Loss of terrestrial habitat	5	5	5	1	5	110 High	4	4	2	2	4	64 Medium – Low
Loss of Aquatic Biota	5	5	5	1	5	110 High	3	3	2	2	4	48 Low
Loss of Terrestrial Fauna	5	5	5	1	5	110 High	3	3	2	2	3	42 Low
Loss of Terrestrial Flora	5	5	5	1	5	110 High	4	4	2	2	3	56 Medium – Low
Introduction and spread of alien vegetation	3	3	3	2	5	60 Medium - Low	2	3	2	1	3	30 Low

Specialist recommended mitigation measure are included in the Environmental Management Programme (EMPr) under Part B of this report.

- 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/Regional (2)	Local/Regional (2)
Probability	Definite (4)	Unlikely (1)
Duration	Long term (3)	Long term (3)
Magnitude	High (3)	Medium (2)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impact (3). 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 High (51)**	**Negative Low (26)**
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. Also refer to section (f) of the EMPr.	

- Change in land-use – The use of the area for the operation of the prospecting activity will not disturb any land use activities on most of the portions as both will be done concurrently.

The proposed portions have historic diggings (two sites). It should be noted that outstanding rehabilitation, from previous mining related activities by unknown right holder/s, is present on site and **Morgenson Mining (Pty) Ltd** will not take responsibility to rehabilitate the areas. However, if Morgenson Mining (Pty) Ltd is to prospect on the disturbed areas, they will rehabilitate the areas they disturbed.

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)	Unlikely (1)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impacts (3).	
Significance	**Negative medium (30)**	**Negative Low (12)**
Can impacts be mitigated?	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. Also refer to section (f) of the EMPr.	

- Generation of alternative land use income – Income generated through the diamond mine will provide the farming enterprise 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	Site (1)	Site (1)
Probability	Definite (4)	Definite (4)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	High (3)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resources (1)	No loss of resources (1)
Cumulative impact	Medium cumulative impact (3).	
Significance	**Positive Low (24)**	**Positive medium (36)**
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. Only the specific trench being excavated at the specific time should be cleared

Increase in storm water runoff	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	site (2)
Probability	Probable (3)	Unlikely (1)
Duration	Long term (3)	Medium term (3)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impact (3) - Should these impacts occur, there will be a cumulative impacts on the wider area.	
Significance	**Negative medium (30)**	**Negative low (13)**
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 The cut-off trenches and silt fences will be installed where necessary as to control runoff storm water by attenuating it and control the movement of sediment on the premises. These structures will be monitored on a regular basis. It is suggested that it be monitored on a weekly basis during the rainy season, and after possible rain events during the dry season. If these practices is found to be insufficient for the control of storm water and sedimentation, other alternatives should immediately be investigated and implemented.	

Increased consumption of water - Since 4 x 16 feet washing pan will be used, the amount of water for the pans will be 68 000 L/hour from which 30% is re-used.

Increased consumption of water	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative

Extent	Region (3)	Region (3)
Probability	Definite (4)	Definite (4)
Duration	Long term (3)	Long term (3)
Magnitude	High (3)	Medium (2)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Significant loss of resources (3)	Marginal loss of resources (2)
Cumulative impact	High cumulative impacts (4) - An additional demand on water sources could result in a significant cumulative impact with regards to the availability of water.	
Significance	**Negative high impact (63)**	**Negative medium (40)**
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 – Approximately 15 workers will be present on site during working hours, Monday to Saturday. Sources of general waste will be waste food, packaging, paper, etc. General waste will be stored on the site and removed on a weekly basis by a contractor.

Generation of waste	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Definite (4)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Medium cumulative impact (3) - An additional demand for landfill space could result in significant cumulative impacts with regards to the availability of landfill space.	
Significance	**Negative medium (30)**	**Negative low (14)**
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	Local (2)	Site (2)
Probability	Possible (2)	Unlikely (1)
Duration	Long term (3)	Medium term (3)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss of resource (2)
Cumulative impact	The impact would result in low cumulative effects (2)	
Significance	**Negative medium (35)**	**Negative low (24)**
Can impacts be mitigated?	Yes. To manage these impacts all staff and supervisors at workshops and fuel storage areas should be trained in hydrocarbon spill response and each of these areas should be equipped with the appropriate spill response kits and any contaminated soil must be disposed of correctly at a suitable location.	

	It is therefore important that all management actions and mitigation measures included in the section (f) of EMPr are implemented to ensure that these impacts do not occur.

- Noise disturbance - Prospecting activities will result in the generation of noise over a period of 3-5 years. Sources of noise are likely to include vehicles, the use of machinery such as backactors, rotary pans and people working on the site. The noise impact is unlikely to be significant as the closest town or community is approximately 5km south of the proposed area.

  The following three primary variables should be considered when designing acoustic screening measures for the control of sound and/or noise:

  - The source – Reduction of noise at the source;
  - The transmission path – Reduction of noise between the source and the receiver;
  - The receiver – Reduction of the noise at the receiver.

  Increased noise levels are directly linked with the various activities associated with the construction of the proposed facility and related infrastructure, as well as the operational phase of the activity.

Community Noise

Community noise impacts should not exceed the levels presented in Table below of South African Standards or result in a maximum increase above background levels of 3 dBA at the nearest receptor location off-site.

- The noise levels are relevant to noise impacts beyond the property boundary of the facility. However, noise prevention and mitigation measures should be applied where predicted or measured noise impacts from a project facility or operations exceed the applicable noise level guideline at the most sensitive point of reception. A point of reception or receptor may be defined as any point on the premises occupied by persons where extraneous noise and/or vibration are received.
- South African National Standard (SANS) 10103 (2008) provides a guideline for estimating community response to an increase in the general ambient noise level caused by intruding noise.

SITE	WHO / IFC LAEQ (1H) DBA		SOUTH AFRICAN STANDARDS	
	DAY 07:00 – 19:00	NIGHT 19:00 – 07:00	DAY 07:00 – 19:00	NIGHT 19:00 – 07:00
Residential; Institutional; Educational	55	45	55	45
Industrial, Commercial	70	70	70	60

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	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	The impact would result in low cumulative effects (2).	
Significance	**Negative low (22)**	**Negative Low (10)**
Can impacts be mitigated?	Yes, management actions related to noise pollution are included in section (f) of the EMPr.	

- Contamination from tailings material – the washing process of the mineral only uses water. Tailing is non-hazardous and should be pumped into open pits and trenches as part of concurrent rehabilitation.

Contamination from tailings material	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Unlikely (1)	Unlikely (1)
Duration	Medium term (2)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2)	
Significance	**Negative low (18)**	**Negative low (8)**
Can impacts be mitigated?	• Tailings material must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds • Proper storm water management should be implemented. Berms should also be constructed to ensure separation of clean water and dirty water areas; • Concurrent rehabilitation should be conducted; • The monitoring results must be interpreted annually, and network audited annually as well to ensure compliance with regulations.	

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 – The impact of the proposed prospecting of Diamonds Alluvial (DA) and Diamonds General (D) on the areas sense of place with mitigation is likely to be low. In addition, the site will only be visible from the gravel roads.

Potential impacts on tourism	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)	Medium term (2)
Magnitude	Low (1)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	No loss of resources (1)	No loss of resources (1)
Cumulative impact	Medium cumulative impacts (3)	
Significance	**Negative low (10)**	**Negative low (10)**
Can impacts be mitigated?	No mitigation required	

- **Impacts on cultural heritage objects:**

According to the preliminary Cultural Heritage Impact Assessment report (**Appendix 12**):

A total of eight heritage sites were recorded during the survey of which six are historical stone-walled structures (Sites 1, 2, 3, 6, 7 and 8), a grave (Site 4) and rock art (engraving (Site 5). The historical sites are probably associated with the late 19th century and early 20th century Korana people and/or farm worker accommodation keeping their own livestock. No Stone Age or Iron Age settlements, structures, features or assemblages were recorded during the survey.

It is well known that Late Iron Age stone-walled settlements do not usually occur in open low-lying grasslands. The well-known Korana settlements of Chief Mossweu are located near Mamusa Hill (further east near Schweizer-Reneke) and other Tswana settlement (Rolong and Tlhaping) occur further north and east of the survey area.

It is therefore recommended, from a cultural heritage perspective that the proposed prospecting activities may proceed.

Nature: Six historical stone walled enclosures, a grave and a rock art site.		
	Without mitigation	**With mitigation**
Pre-construction & Construction Phase		
Probability	Definite (5)	Very Improbable (1)
Duration	Permanent (5)	Short term (2)
Extent	Limited to the site (1)	Limited to the site (1)
Magnitude	Very High (10)	Minor (2)
Significance of Impact	**80 (High)**	**5 (Low)**
Status (positive or negative)	Negative	Positive
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	None
Cumulative impacts and indirect impacts	Prospecting activities result in extensive heavy vehicle traffic, extraction of deposits, movements of heavy machinery which culminate in vibrations and dust which will also indirectly affect the heritage remains.	
Can impacts be mitigated?	Yes, buffer zones are recommended (50 metres)	

Also, please note:
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)).

- Impact on Fossil heritage

According to the Palaeontological Desktop Assessment (**Appendix 12**):

Loss of fossil heritage will be a negative impact. Only the site will be affected by the proposed development. The expected duration of the impact is assessed as potentially permanent to long term. In the absence of mitigation procedures, the damage or destruction of any palaeontological materials will be permanent. Impacts on palaeontological heritage during the construction phase could potentially occur.

Table 3:Summary of Impacts

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

	Extent	Duration	Magnitude	Reversibility	Irreplicable loss	Cumulative effect	Impact
Pre-Mitigation	1	4	2	4	4	2	30
Post-Mitigation	1	4	1	4	4	2	15

The following procedure will only be followed if fossils are uncovered during the excavation phase of the development.

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".

1.2.1 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.
- 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.

DECOMMISIONING 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 3/5 year period, the site will be returned to its natural state. Therefore the physical environment will benefit from the closure of the prospecting area.

- Rehabilitation of the physical environment – The physical environment will benefit from the closure of the prospecting area since the site will be restored closely to its natural state.

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	Probable (3)	Definite (4)
Duration	Long term (3)	Permanent (4)
Magnitude	Medium (2)	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 (16)**	**Positive Medium (30)**
Can impacts be mitigated?	No mitigation measures required.	

- Impacts on the Ecological aspects:

According to the Terrestrial Biodiversity and Wetland Impact Assessment:

The prospecting activities will result in a disturbance of the wetland systems and vegetation habitats during the construction, operation, and decommissioning phases. During rainfall events, the wetland areas will receive an influx of sediment and possible toxic pollutants. See Table 23 below for a list of expected impacts.

Table 21: Summary of potential

Construction Phase	Operational Phase	Decommissioning Phase
Changing the physical structure within a water resource (habitat)	Changing the physical structure within a water resource (habitat)	Loss of terrestrial habitat
Alteration of the amount of sediment entering the water resource and associated change in turbidity	Alteration of the amount of sediment entering the water resource and associated change in turbidity	Changing the physical structure within a water resource (habitat)
Alteration of water quality (during rainfall events)	Alteration of water quality (during rainfall events)	Introduction and spread of alien vegetation
Loss of terrestrial habitat	Loss of terrestrial habitat	
Loss of Aquatic Biota	Loss of Aquatic Biota	
Loss of Terrestrial Fauna	Loss of Terrestrial Fauna	
Loss of Terrestrial Flora	Loss of Terrestrial Flora	
Introduction and spread of alien vegetation	Introduction and spread of alien vegetation	

According to the Terrestrial Biodiversity and Wetland Impact Assessment:

Table 27: Decommissioning Phase Impact Assessment

Potential Environmental Impact	Environmental Impact Before Mitigation						Environmental Impact After Mitigation					
	Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration	Significance	Frequency of Impact	Frequency of Activity	Severity	Spatial Scale	Duration	Significance
Loss of terrestrial habitat	4	4	2	2	3	56 Medium – Low	3	4	2	1	2	35 Low
Loss of terrestrial habitat	4	4	2	2	3	56 Medium – Low	3	4	2	1	2	35 Low
Loss of Terrestrial Flora	4	4	2	2	3	56 Medium – Low	3	4	2	1	2	35 Low
Changing the physical structure within a water resource (habitat)	5	5	5	1	5	110 High	3	4	2	2	2	42 Low
Introduction and spread of alien vegetation	4	3	3	3	3	63 Medium – Low	3	3	2	1	2	30 Low

Specialist recommended mitigation measure are included in the Environmental Management Programme (EMPr) under Part B of this report.

- Loss of employment - Employed will be lost during the decommissioning of the facility and has the potential to have a negative social impact on the local community.

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	Medium term (2)	Short term (1)
Magnitude	High (3)	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	The impact would result in negligible to no cumulative effects (1)	
Significance	**Negative medium (30)**	**Negative low (18)**
Can impacts be mitigated?	The following mitigation measures are recommended: • All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning; • **Morgenson Mining (Pty) Ltd** 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.

K. SUMMARY OF THE FINDINGS AND RECOMMENDATIONS OF ANY SPECIALIST REPORT

(where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment 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.
Terrestrial Biodiversity and Wetland Impact Assessment Report was conducted by Reuben van Breda from Milnex CC and externally reviewed by Mari van der Westhuizen	**Conclusion** 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: • Animal Species Theme: **Medium Sensitivity** • Aquatic Biodiversity Theme: **Very High Sensitivity**. • Plant Species Theme: **Medium Sensitivity**. • Terrestrial Biodiversity Theme: **Very High Sensitivity.** 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: • The site presented a **Very High sensitivity for the Animal Species Theme** due to the presence of Ardeotis kori, *Sagittarius serpentarius*, Aonyx capensis, *Hydrictis maculicollis, Orycteropus afer, Proteles cristata,* and *Smutsia temminckii* on the application area. • The site presented a **Very High Sensitivity for the Aquatic Species Theme** due to the presence of one Channelled valley bottom, one Floodplain, and two Depression wetlands on the application area. • The site presented a **Medium Plant Species Sensitivity Theme** due to the presence of *Vachellia erioloba* on the application area. • The site has a **High sensitivity from a Terrestrial Biodiversity** perspective. The southern part of the application area overlaps an ESA1 and borders a CBA1, whilst the rest of the application area overlaps ONA. The information below concludes the Desktop findings supported by field verifications.	**X**	**Pages:**

- According to the National Threatened Ecosystem database (2011), no threatened ecosystems overlap with the study site. There are some Priority Focus Area just South and downstream of the application area.
- According to the Northern Cape Biodiversity sector plan and map (2015), the study area was observed to overlap an ESA 1 area and is located within 10 km from both a CBA 1 and CBA 2 area. The majority of the rest of the application area is comprised of other natural areas, and very little of the application area is transformed from the natural state.
- The application area is located roughly 11 km Southeast of Spitskopdam, a recognized Important Bird and Biodiversity area (IBA) (SANBI, 2015).
- According to the National Freshwater Ecosystem Priority Areas Database (NFEPA, 2011), three (3) wetland types were expected to occur within and around the study area (**Figure 18**). These are a River, one Depression and some Seep wetlands. A site visit confirmed the presence of tone CVB, one FP, and two Depressions as well as an unnatural Seep, a mine dam, and the Vaalharts channel.
- The study area is not found in a Strategic Water Source Area (SWSA).
- Some naturalized exotic weeds, exotic, and invasive vegetation species were recorded on site (*Tagetes minuta, Erigeron bonariensis, Bidens pilosa*)
- 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 11**) for a species list.
- For Mammal species potentially occurring on site, and that enjoy conservation status in the Eskom Red Data Book, kindly refer to Section 4.3.2 (**Table 12**) for a species list.
- For Herpetofauna species potentially occurring on site, and that enjoy conservation status in the Eskom Red Data Book, kindly refer to Section 4.3.3 (**Table 13**) for a species list.
- Results for wetlands recorded are summarised in the **Table** below:

Wetland Assessment:

Classification	Scientific Buffer	PES	EIS	REC
CVB 1	38m	B	High	A Improve
UVB 2	53m	A	High	A maintain
D1 & D2	37m	B	Moderate	B Maintain

	Sensitivity and Impact Assessment: **NEMA Impact assessment**: Most of the impacts associated with the prospecting activities range from Medium/Low to High prior to mitigation taking place. With mitigation fully implemented, the significance of most impacts can be reduced to Very Low to Medium/Low **Mitigation Measures**: Refer to Section 7.5 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. It is recommended that sites providing high mineral yield outside the exclusion buffers be investigated. Thereafter, can the proposed mining operations be considered from an ecological conservation point of view. It is also recommended that operations be conducted outside the areas of high or very high sensitivity. 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.		
A Palaeontological Desktop Assessment was conducted by Elize Butler from Banzai Environmental (Pty) Ltd	**FINDINGS AND RECOMMENDATIONS** The proposed Morgenson Prospecting Right Application Near Windsorton in the Northern Cape province proposed development is entirely underlain by the Ecca Group. According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of the Ecca Group is High (Almond et al, 2013; SAHRIS website). The geology has recently been updated (Council of Geosciences, Pretoria) and indicates that the proposed development is underlain by the Ecca Group, (Karoo Supergroup) as well as the Allanridge Formation (Ventersburg Supergroup). A Low Palaeontological significance has been allocated to the proposed development and it is therefore considered that the proposed development will not lead to damaging impacts on the palaeontological resources of the area. However, 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/site manager in charge of these developments. These discoveries ought to be protected (if possible, in situ) and the ECO/site manager must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town	**X**	

	8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation (recording and collection) can be carry out by a paleontologist. Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum standards for palaeontological impact studies suggested by SAHRA.		
Cultural Heritage Impact Assessment was conducted by Francois P. Coetzee	**Recommendations and Conclusions** A total of eight heritage sites were recorded during the survey of which six are historical stone-walled structures (Sites 1, 2, 3, 6, 7 and 8), a grave (Site 4) and rock art (engraving (Site 5). The historical sites are probably associated with the late 19th century and early 20th century Korana people and/or farm worker accommodation keeping their own livestock. No Stone Age or Iron Age settlements, structures, features or assemblages were recorded during the survey. It is well known that Late Iron Age stone-walled settlements do not usually occur in open low-lying grasslands. The well-known Korana settlements of Chief Mossweu are located near Mamusa Hill (further east near Schweizer-Reneke) and other Tswana settlement (Rolong and Tlhaping) occur further north and east of the survey area. It is therefore recommended, from a cultural heritage perspective that the proposed prospecting activities may proceed.	**X**	

Nature: Six historical stone walled enclosures, a grave and a rock art site.

	Without mitigation	**With mitigation**
Pre-construction & Construction Phase		
Probability	Definite (5)	Very Improbable (1)
Duration	Permanent (5)	Short term (2)
Extent	Limited to the site (1)	Limited to the site (1)
Magnitude	Very High (10)	Minor (2)
Significance of Impact	**80 (High)**	**5 (Low)**
Status (positive or negative)	Negative	Positive
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	None
Cumulative impacts and indirect impacts	Prospecting activities result in extensive heavy vehicle traffic, extraction of deposits, movements of heavy machinery which culminate in vibrations and dust which will also indirectly affect the heritage remains.	
Can impacts be mitigated?	Yes, buffer zones are recommended (50 metres)	

Also, please note:
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)).

See **Appendix 12** for the specialist report.

According to the DFFE Screening Report, nine (9) specialist assessments needs to be conducted, please see the table below for the list of these studies and also our response.

Specialist study according to DEA Screening tool		Response
Agriculture Impact Assessment		We do not see a need for this study. The prospecting activity will not disturb existing activities on the portions as both (existing activities and prospecting activities) can be done concurrently. The proposed area is currently being used for game/livestock grazing and crop production under central pivot irrigation. According to the DFFE Screening Report the Agriculture theme sensitivity of the proposed area fall mostly within low and medium sensitivity. The land capability for the proposed area and surrounding area also falls within Land in Class 5. The Prospecting Work Programme (PWP) states 150 pits [5m (length) x 3m (breath) x 5m (depth)] and 50 trenches [50m (length) x 30m (breath) x 5m (depth)] will be dug. This calculates to a disturbance of ± 7.73ha. The whole application area is 1910.1349ha thus the ±7.73ha disturbance is small compared to the size of the application area. Mitigation measures as in the EMPr will be implemented. Concurrent backfilling will also take place in order to rehabilitate which means only 0.375ha will be disturbed at any given time. Due to the low disturbance (±7.73ha over a 1910.1349ha area) the impact is expected to be low, since mitigation measures will be implemented and concurrently rehabilitation will take place.
Biodiversity study	**Animal Species Assessment**	Specialist studies were conducted, please see the table above. The studies are available under **Appendix 12.**
	Aquatic Biodiversity Impact Assessment	
	Plant Species Assessment	
	Terrestrial Biodiversity Impact Assessment	
Archaeological and Cultural Heritage Impact Assessment		Specialist studies were conducted. Please see **Appendix 12.**
Palaeontology Impact Assessment		
Noise Impact Assessment		The EAP do not see the need for this study as noise is limited to working hours, mitigation measure outlined in this report will be sufficient to address noise impacts

Radioactivity Impact Assessment	This study is not necessary since the process of prospecting Diamonds does not have any radioactive effects.

L. AN ENVIRONMENTAL IMPACT STATEMENT WHICH CONTAINS—

(i) a summary of the key findings of the environmental impact assessment:

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 Terrestrial Biodiversity and Wetland Impact Assessment:

The study site falls within the C33B, C33C, C91D Quaternary Catchments and forms part of the Lower Vaal WMA. The Lower Vaal WMA covers a total catchment area of 134 125 km^2, with its major rivers being the Harts, Molopo, and the Vaal.

The study area is comprised of dense thorny Camphor bushveld, gradually becoming slightly grassier towards the southern end of the application area and becoming increasingly interspersed by trees towards the northern end of the application area. One small area on the northern end has been disturbed by mining, and the Vaalharts channel intersects the application area. The majority of the application area (both the RE and Portion 1) is natural and undisturbed. Land use on site and the surrounding areas is limited, with some areas converted to extraction sites, fallow lands, and temporary crops.

DFFE Screening tool report Assessment:
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:

- *Animal Species Theme:* ***Medium Sensitivity***
- *Aquatic Biodiversity Theme:* ***Very High Sensitivity***.
- *Plant Species Theme:* ***Medium Sensitivity***.
- *Terrestrial Biodiversity Theme:* ***Very High Sensitivity.***

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:

- *The site presented a* ***Very High sensitivity for the Animal Species Theme*** *due to the presence of Ardeotis kori, Sagittarius serpentarius, Aonyx capensis, Hydrictis maculicollis, Orycteropus afer, Proteles cristata, and Smutsia temminckii on the application area.*
- *The site presented a* ***Very High Sensitivity for the Aquatic Species Theme*** *due to the presence of one Channelled valley bottom, one Floodplain, and two Depression wetlands on the application area.*
- *The site presented a* ***Medium Plant Species Sensitivity Theme*** *due to the presence of Vachellia erioloba on the application area.*
- *The site has a* ***High sensitivity from a Terrestrial Biodiversity*** *perspective. The southern part of the application area overlaps an ESA1 and borders a CBA1, whilst the rest of the application area overlaps ONA.*

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. There are some Priority Focus Area just South and downstream of the application area.*
- *According to the Northern Cape Biodiversity sector plan and map (2015), the study area was observed to overlap an ESA 1 area and is located within 10 km from both a CBA 1 and CBA 2 area. The majority of the rest of the application area is comprised of other natural areas, and very little of the application area is transformed from the natural state.*
- *The application area is located roughly 11 km Southeast of Spitskopdam, a recognized Important Bird and Biodiversity area (IBA) (SANBI, 2015).*
- *According to the National Freshwater Ecosystem Priority Areas Database (NFEPA, 2011), three (3) wetland types were expected to occur within and around the study area (****Figure 18****). These are a River, one*

Depression and some Seep wetlands. A site visit confirmed the presence of tone CVB, one FP, and two Depressions as well as an unnatural Seep, a mine dam, and the Vaalharts channel.

- *The study area is not found in a Strategic Water Source Area (SWSA).*
- *Some naturalized exotic weeds, exotic, and invasive vegetation species were recorded on site (Tagetes minuta, Erigeron bonariensis, Bidens pilosa)*
- *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 11**) for a species list.*
- *For Mammal species potentially occurring on site, and that enjoy conservation status in the Eskom Red Data Book, kindly refer to Section 4.3.2 (**Table 12**) for a species list.*
- *For Herpetofauna species potentially occurring on site, and that enjoy conservation status in the Eskom Red Data Book, kindly refer to Section 4.3.3 (**Table 13**) for a species list.*
- *Results for wetlands recorded are summarised in the **Table** below:*

Wetland Assessment:

Classification	*Scientific Buffer*	*PES*	*EIS*	*REC*
CVB 1	*38m*	*B*	*High*	*A Improve*
UVB 2	*53m*	*A*	*High*	*A maintain*
D1 & D2	*37m*	*B*	*Moderate*	*B Maintain*

Sensitivity and Impact Assessment:

NEMA Impact assessment	*Most of the impacts associated with the prospecting activities range from Medium/Low to High prior to mitigation taking place. With mitigation fully implemented, the significance of most impacts can be reduced to Very Low to Medium/Low*
Mitigation Measures	*Refer to Section 7.5*

Impact Statement:

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. It is recommended that sites providing high mineral yield outside the exclusion buffers be investigated. Thereafter, can the proposed mining operations be considered from an ecological conservation point of view. It is also recommended that operations be conducted outside the areas of high or very high sensitivity. 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.

➢ Potential impact on palaeontological, heritage and cultural resources:

Heritage and cultural resources

According to the preliminary Cultural Heritage Impact Assessment report (**Appendix 12**):

A total of eight heritage sites were recorded during the survey of which six are historical stone-walled structures (Sites 1, 2, 3, 6, 7 and 8), a grave (Site 4) and rock art (engraving (Site 5). The historical sites are probably associated with the late 19th century and early 20th century Korana people and/or farm worker accommodation keeping their own livestock.

No Stone Age or Iron Age settlements, structures, features or assemblages were recorded during the survey.

It is well known that Late Iron Age stone-walled settlements do not usually occur in open low-lying grasslands. The well-known Korana settlements of Chief Mossweu are located near Mamusa Hill (further east near Schweizer-Reneke) and other Tswana settlement (Rolong and Tlhaping) occur further north and east of the survey area.

It is therefore recommended, from a cultural heritage perspective that the proposed prospecting activities may proceed.

Nature: Six historical stone walled enclosures, a grave and a rock art site.		
	Without mitigation	**With mitigation**
Pre-construction & Construction Phase		
Probability	Definite (5)	Very Improbable (1)
Duration	Permanent (5)	Short term (2)
Extent	Limited to the site (1)	Limited to the site (1)
Magnitude	Very High (10)	Minor (2)
Significance of Impact	**80 (High)**	**5 (Low)**
Status (positive or negative)	Negative	Positive
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	None
Cumulative impacts and indirect impacts	Prospecting activities result in extensive heavy vehicle traffic, extraction of deposits, movements of heavy machinery which culminate in vibrations and dust which will also indirectly affect the heritage remains.	
Can impacts be mitigated?	Yes, buffer zones are recommended (50 metres)	

Also, please note:
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)).

Palaeontology

Findings according to the Palaeontological Desktop Assessment (**Appendix 12):**

The proposed Morgenson Prospecting Right Application Near Windsorton in the Northern Cape province proposed development is entirely underlain by the Ecca Group. According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of the Ecca Group is High (Almond et al, 2013; SAHRIS website). The geology has recently been updated (Council of Geosciences, Pretoria) and indicates that the proposed development is underlain by the Ecca Group, (Karoo Supergroup) as well as the Allanridge Formation (Ventersburg Supergroup). A Low Palaeontological significance has been allocated to the proposed development and it is therefore considered that the proposed development will not lead to damaging impacts on the palaeontological resources of the area.

*/However, 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/site manager in charge of these developments. These discoveries ought to be protected (if possible, in situ) 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 mitigation (recording and collection) can be carry out by a paleontologist.*

Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum standards for palaeontological impact studies suggested by SAHRA.

- **Potential social impacts**:

The presence of construction / operational workers poses a potential risk to family structures and social networks.

While the presence of construction / operational workers does not in itself constitute a social impact, the manner in which construction 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 impacts on land use**:

According to the map below (**Figure 23** and **Figure 24**), the proposed area is largely covered by Grasslands with some areas in Forested Land, Mines & Quarries and Waterbodies.

The google earth (**Figure 25**) map shows the area is mostly natural, roads travers the proposed area and there is disturbance from previous mining related activities.

According to the Terrestrial Biodiversity and Wetland Impact Assessment:

> *According to GIS data, the majority of the study area is comprised of natural grassland with some limited areas of forested land and mines & quarries. The southernmost border if the application area is comprised of a natural waterbody (Vaalriver).*
>
> *Land use on site and the surrounding areas is very limited, with some of the surrounding areas having been converted to extraction sites, fallow lands, and temporary crops. The only land use within the application area is some extraction sites. Most of the application area is unmodified and natural.*

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

All infrastructure will be temporary and/or mobile.

- **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-medium 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 alluvial diamonds will have 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. It is therefore recommended that the environmental authorisation for the prospecting right be granted.

(i) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred [site] development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and

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

According to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

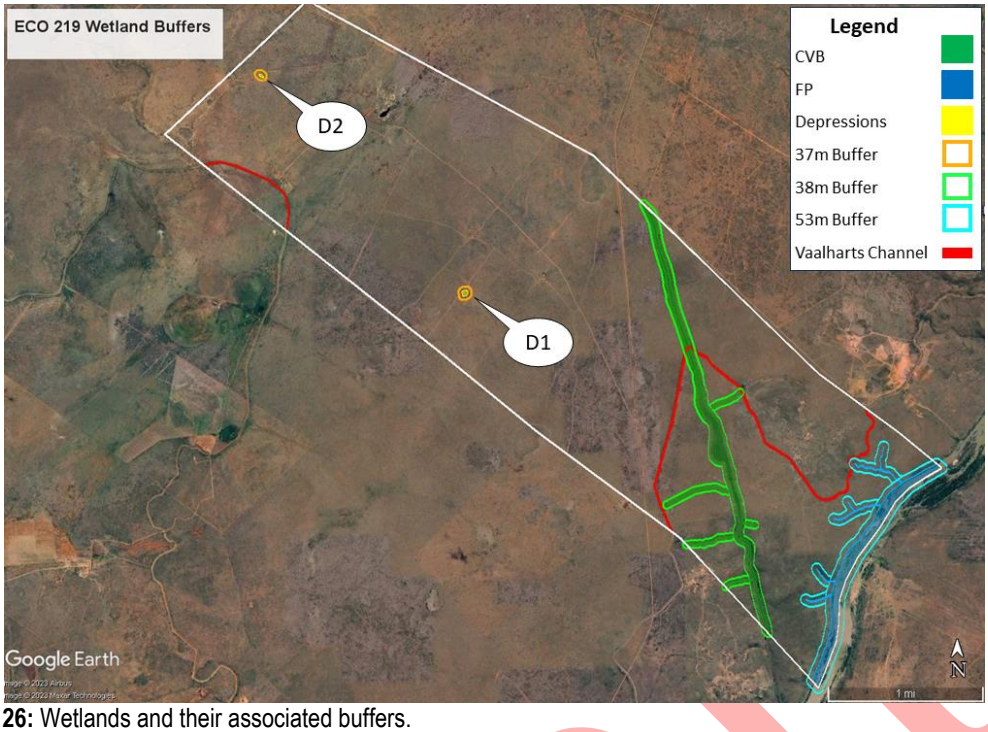


Figure 26: Wetlands and their associated buffers.

Site identified according to the preliminary Cultural Heritage Impact Assessment report (**Appendix 12**):

- a 50meter buffer must be maintained between the Prospecting activities and below sites.

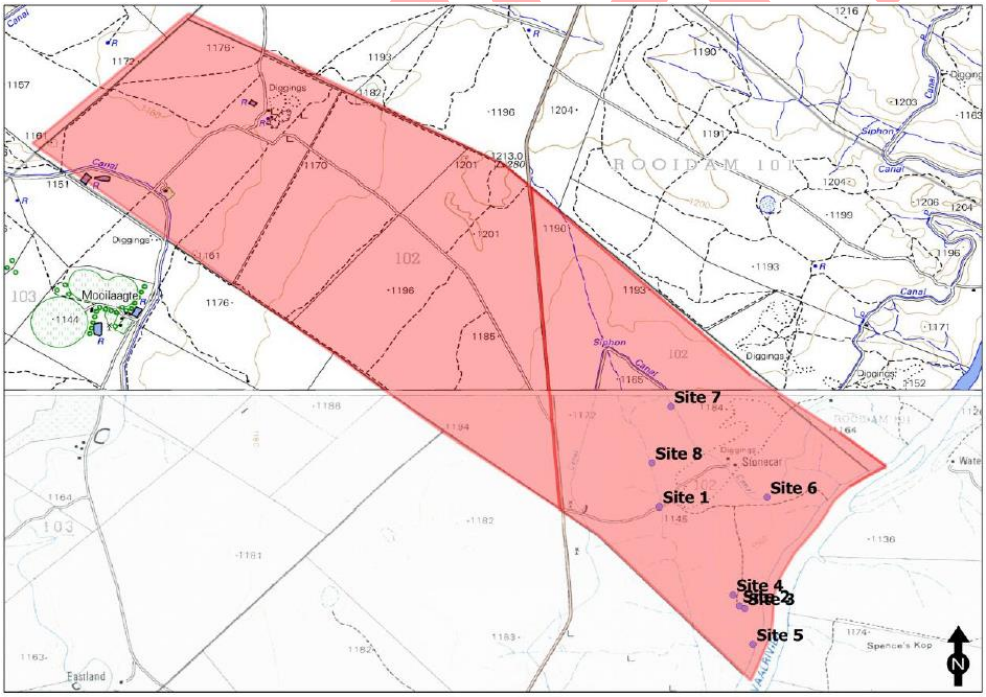


Figure 26: Location of the various recorded heritage sites

7.2 Heritage sites

A total of eight heritage sites were recorded during the survey of which six are historical stone-walled structures (Sites 1, 2, 3, 6, 7 and 8), a grave (Site 4) and rock art (engraving (Site 5). The historical sites are probably associated with the late 19th century and early 20th century Korana people and/or farm worker accommodation keeping their own livestock.

No Stone Age or Iron Age settlements, structures, features or assemblages were recorded during the survey.

Locations and Evaluation of Sites

Table 7: Location and evaluation of sites

Site No	Coordinates	Site Type	Field Rating of Significance	Impact	Proposed Mitigation
1	28.261098°S 24.689057°E	Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
2	28.270507°S 24.696751°E	Small Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
3	28.270755°S 24.697259°E	Historical stone-walled settlement and livestock enclosures	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
4	28.269463°S 24.696134°E	Grave and Historical stone-walled livestock enclosure	Generally Protected A High significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
5	28.274193°S 24.698040°E	Rock Art	Local/Grade 3B High significance (mitigation required)	None	• Maintain a buffer zone of 50 metres during prospecting phase
6	28.260196°S 24.699383°E	Historical stone-walled livestock enclosures and houses	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
7	28.251502°S 24.690159°E	Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
8	28.256895°S 24.688358°E	Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase

(ii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;

There is regional socio economic benefits due to the diamonds being prospected in the Norther Cape Province and greater knowledge is gained on the mineralogy of South Africa. All possible negative impacts and risks that have been identified in this report can be effectively mitigated and managed by implementing the mitigation measures as set out in the Environmental Management Programme (EMPr) attached in Part B. Significant adverse social environmental impacts are anticipated.

M. PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR

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

Management objectives include:

- Ensure that the prospecting activity does not cause pollution to the environment or harm to persons.
- Minimise production of waste.
- 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 diamond prospecting.
- Compliance with legislative requirements.
- Mine is neat and tidy and well managed.

N. 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. Scoping and EIA process for a Prospecting Right of Diamonds Alluvial (DA) and Diamonds General (D) near Windsorton on the Remaining Extent and Portion 1 of Farm 102, Registration Division: Barkley West, Northern Cape province is preferred due to the sites underlying alluvial diamond bearing gravel, therefore there will be no other alternative (i.e. to facilitate the movement of machinery, equipment, infrastructure).

O. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION.

(Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;)

- The operational activities and relevant rehabilitation of disturbed areas should be monitored against the improved EMPr 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 EMPr.

P. 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. In terms of addressing the key issues the EAP is satisfied that there are no major gaps in knowledge and that the report provides sufficient information to conduct the significance rating and provide the environmental authority with sufficient information to make an informed decision.

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

(and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;)

Reasons why the activity should be authorized or not.

Based on the outcomes of other diamond mines in the area, the possibility to encounter further Diamond Reserves were identified.

The proposed prospecting area is targeted as, historically, several alluvial diamond occurrences are known in the area, and a number of these have been exploited in the past.

The option of not approving the activities will result in a significant loss to valuable diamond deposits being exploited. And all economic benefits will be lost.

Conditions that must be included in the authorisation

- The operational activities and relevant rehabilitation of disturbed areas should be monitored against the improved EMPr 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 EMPr.

The EMPr should be binding on all managers and contractors operating/utilizing the site.
The applicant shall familiarize himself with the content of this document and the attached specialist studies and the requirements/conditions thereof.

R. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED.

For a minimum of 5 years.

S. AN UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP IN RELATION TO:

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

I, Ms. Lizanne Esterhuizen, Reg EAP (EAPASA) Pr. Sci. Nat. 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:

24 July 2023

Date:

T. FINANCIAL PROVISION

(where applicable, details of any financial provision[s] for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;)

CALCULATION OF THE QUANTUM

Applicant: Morgenson Mining (Pty) Ltd — **Ref No.:** NC30/5/1/1/2/11959PR
Evaluators: Milnex CC — **Date:** 24/07/2023

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and pow erlines)	m3	300	19	1	1	5700
2 (A)	Demolition of steel buildings and structures	m2	24	171	1	1	4104
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	400	1	1	0
3	Rehabilitation of access roads	m2	400	49	1	1	19600
4 (A)	Demolition and rehabilitation of electrified railw ay lines	m	0	471	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railw ay lines	m	0	257	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	542	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0,4	284292	1	1	113716,8
7	Sealing of shafts adits and inclines	m3	0	146	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,2	189518	1	1	37903,6
8 (B)	Rehabilitation of processing w aste deposits and evaporation ponds (non-polluting potential)	ha	0,1	236054	1	1	23605,4
8 (C)	Rehabilitation of processing w aste deposits and evaporation ponds (polluting potential)	ha	0	685512	1	1	0
9	Rehabilitation of subsided areas	ha	0,01	158701	1	1	1587,01
10	General surface rehabilitation	ha	0,2	150138	1	1	30027,6
11	River diversions	ha	0	150138	1	1	0
12	Fencing	m	0	171	1	1	0
13	Water management	ha	0,02	57087	1	1	1141,74
14	2 to 3 years of maintenance and aftercare	ha	0,5	19930	1	1	9965
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum	0			1	0
					Sub Total 1		247351,15
1	Preliminary and General		29682,138		weighting factor 2 1,05		31166,2449
2	Contingencies			24735,115			24735,115
					Subtotal 2		303252,51
					VAT (15%)		45487,88
					Grand Total		**348740**

It should be noted that outstanding rehabilitation, from previous mining related activities by unknown right holder/s, is present on site and **Morgenson Mining (Pty) Ltd** will not take responsibility to rehabilitate the areas. However, if Morgenson Mining (Pty) Ltd is to prospect on the disturbed areas, they will rehabilitate the areas they disturbed.

Calculations

PITS		
Timeframe: ± 2 years (month 7 - 36)		
24 months / 12 months =	2 years in total to dig pits	
Number of pits per year according to the timeframe		
1st year (12 month) =	75 pits	
2nd year (12 month) =	75 pits	
Disturbance for each year according to timeframes		
Area to be disturbed 1st year (12 months)	75 pits x (5m x 3m) / 10 000 =	0.11ha disturbed
Area to be disturbed 2nd year (12 months)	75 pits x (5m x 3m) / 10 000 =	0.11ha disturbed
Total disturbance for 24 months	150 pits x (5m x 3m) / 10 000 =	0.23ha disturbed

TRENCHES:	
Timeframe: ±3 years (month 7 - 48)	
Concurrent backfilling will take place in order to rehabilitate trenches:	
The area to be disturbed for 1 trench	1 trench x (50m x 30m) / 10 000 = 0.15ha
3 trenches will be worked on at any given time: • 2 trenches will be open to remove gravel • 1 trench will be backfilled and rehabilitated	0.15ha x 2 trenches = 0.3ha 0.2ha / 2 = 0.075ha
The area to be disturbed at any given time	0.3ha + 0.075ha = 0.375ha
After the trench is backfilled and rehabilitated only then will another trench be opened.	
Total	0.375ha

CONCURRENT REHABILITATION

Concurrent backfilling will take place in order to rehabilitate. Please see the explanation below how concurrent rehabilitation is carried out:

Topsoil will be removed from trench no.1, where after it will be stored separately on the proposed area. Stored topsoil will be kept separate from overburden. Stored topsoil will be adequately protected from being eroded or blown away.

The exposed diamondiferous gravel of trench no.1 and no.2 will then be removed. The diamondiferous gravel will be sorted by means of a screen and all material larger than for example 100mm will be separated from the rest. This material will be used in the backfilling stage. Screened material for example smaller than 100mm will be fed into a wet rotary screen and then directly onto the washing pans.

As prospecting activities progress from trench no.2 towards the following trench no.3, backfilling and rehabilitation of trench no.1 will commence. The coarse gravel sifted at the screen, tailings from the pans and fine concrete will be transported back into open trench no.1. During this process of backfilling, variation in the dumping sequence of different sized materials will be followed to ensure better compaction and stability of the reclaimed gravel. This will ensure that voids surrounding the coarse gravel will be filled up with finer sediments. Compaction will be achieved through heavy vehicles during backfilling stage. This prospecting sequence will be utilised for the final rehabilitation of the last actively prospected trench.

A. **Explain how the aforesaid amount was derived.**

The closure cost estimate provided above is aligned with the National Environmental Management Act: Regulations: Financial Provisioning for Mitigation and Rehabilitation of Environmental Damage Caused by Reconnaissance, Prospecting, Exploration, Mining or Production Operations. The amount was calculated by Milnex CC.

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

Financial Guarantee

The financial guarantee for the rehabilitation for land disturbed by **Morgenson Mining (Pty) Ltd** will be submitted

Rehabilitation Fund

Morgenson Mining (Pty) Ltd will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

U. DEVIATIONS FROM THE APPROVED SCOPING REPORT AND PLAN OF STUDY.

(i) Any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and

None of the methodologies approved for the scoping report were deviated.

(ii) Motivation for the deviation.

Not applicable

V. ANY SPECIFIC INFORMATION THAT MAY BE REQUIRED BY THE COMPETENT AUTHORITY; AND

W. COMPLIANCE WITH THE PROVISIONS OF SECTIONS 24(4)(A) AND (B) OF THE ACT

Read with Section 24 (3) (A) and (7) of the National Environmental Management Act (Act 107 of 1998). The EIA Report must include the:

ii. **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 Diamonds Alluvial (DA) and Diamonds General (D) prospecting will not impact directly on any socio-economic aspects. Indirect socio-economic benefits are expected to be associated with the creation of employment.

iii. **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).

- Refer to the Paleontological Study conducted (**Appendix 12**).
- Refer to the Phase 1 HIA conducted (**Appendix 12**).

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).

The Remaining Extent and Portion 1 of Farm 102, Registration Division: Barkley West in the Northern Cape province is preferred due to the sites underlying geology and the possible shallowness of the diamond bearing gravel to the surface as well as site access (i.e. to facilitate the movement of machinery, equipment, infrastructure and people). The specific site has been chosen for its mineral resources thus making an alternative site selection null and void.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

An EMPr must comply with section 24N of the Act and include—

A. DETAILS OF–

(i) the EAP who prepared the EMPr; and
(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;

Name of Practitioner	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

It is hereby confirmed that the requirements for the provision of the details and expertise of the EAP are contained in Part A, section 1(a) as required. The Curriculum Vitae for the responsible EAP is contained in **Appendix 1 and 2**.

B. DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

(a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;)

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

(a map 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 in **Appendix 4**.

D. A DESCRIPTION OF THE IMPACT MANAGEMENT [OBJECTIVES] OUTCOMES, INCLUDING MANAGEMENT STATEMENTS, IDENTIFYING THE IMPACTS AND RISKS THAT NEED TO BE AVOIDED, MANAGED AND MITIGATED AS IDENTIFIED THROUGH THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR ALL PHASES OF THE DEVELOPMENT INCLUDING—

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 alluvial diamond mine 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 **Morgenson Mining (Pty) Ltd**. 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, where required sustaining either cattle or wildlife.
- 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.

E. A DESCRIPTION AND IDENTIFICATION OF IMPACT MANAGEMENT OUTCOMES REQUIRED FOR THE ASPECTS CONTEMPLATED IN PARAGRAPH (D);]

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:

- Conducing 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.

F. A DESCRIPTION OF PROPOSED IMPACT MANAGEMENT ACTIONS, IDENTIFYING THE MANNER IN WHICH THE IMPACT MANAGEMENT [OBJECTIVES AND] OUTCOMES CONTEMPLATED IN PARAGRAPH (D) [AND (E)] WILL BE ACHIEVED, AND MUST, WHERE APPLICABLE, INCLUDE ACTIONS TO —

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 8.**

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

CALCULATION OF THE QUANTUM

Applicant: Morgenson Mining (Pty) Ltd
Evaluators: Milnex CC

Ref No.: NC30/5/1/1/2/11959PR
Date: 24/07/2023

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	300	19	1	1	5700
2 (A)	Demolition of steel buildings and structures	m2	24	171	1	1	4104
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	400	1	1	0
3	Rehabilitation of access roads	m2	400	49	1	1	19600
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	471	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	257	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	542	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0,4	284292	1	1	113716,8
7	Sealing of shafts adits and inclines	m3	0	146	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,2	189518	1	1	37903,6
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0,1	236054	1	1	23605,4
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	685512	1	1	0
9	Rehabilitation of subsided areas	ha	0,01	158701	1	1	1587,01
10	General surface rehabilitation	ha	0,2	150138	1	1	30027,6
11	River diversions	ha	0	150138	1	1	0
12	Fencing	m	0	171	1	1	0
13	Water management	ha	0,02	57087	1	1	1141,74
14	2 to 3 years of maintenance and aftercare	ha	0,5	19930	1	1	9965
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum	0			1	0
					Sub Total 1		247351,15
1	Preliminary and General		29682,138		weighting factor 2 1,05		31166,2449
2	Contingencies		24735,115				24735,115
					Subtotal 2		303252,51
					VAT (15%)		45487,88
					Grand Total		**348740**

It should be noted that outstanding rehabilitation, from previous mining related activities by unknown right holder/s, is present on site and **Morgenson Mining (Pty) Ltd** will not take responsibility to rehabilitate the areas. However, if Morgenson Mining (Pty) Ltd is to prospect on the disturbed areas, they will rehabilitate the areas they disturbed.

a. Confirm that the financial provision will be provided as determined.

Financial Guarantee

The financial guarantee for the rehabilitation for land disturbed **Morgenson Mining (Pty) Ltd** will be submitted.

Rehabilitation Fund

Morgenson Mining (Pty) Ltd will also make provision for rehabilitation during closure by establishing a rehabilitation trust.

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 m²)	**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 and trenching phase- (construction and operation phase)	**Pits:** 150 pits with dimensions of (5m x 3m x5m) **Trenches:** 50 trenches with dimensions (50m x 30m x5m)	1. Site clearing must take place in a phased manner, as and when required. 2. Areas which are not to be prospected on 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	Duration of operations on the prospecting activities.

Construction of roads	Pitting and trenching phase- (construction and operation phase)	+- 500m	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 to the gravel access road off the N8 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 of Diamonds Alluvial (DA) and Diamonds General (D) – Soils and geology	Pitting and trenching phase- (construction and operation phase)	**Pits:** 150 pits with dimensions of (5m x 3m x5m) **Trenches:** 50 trenches with dimensions (50m x 30m x5m)	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 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 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.	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the mine

			8. The impact on the geology will be permanent. There is no mitigation measure.		
Prospecting Diamonds Alluvial (DA) and Diamonds General (D) – excavations and blasting	Pitting and trenching phase- (construction and operation phase)	**Pits:** 150 pits with dimensions of (5m x 3m x5m) **Trenches:** 50 trenches with dimensions (50m x 30m x5m)	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. 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	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the prospecting 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. 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.		

Mitigation measures according to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

Impact	Source of Impact	Recommended Mitigation Measures
Changing the physical structure within a water resource (habitat)	• **Construction:** • Infrastructure development within wetlands. • Loss of vegetation. • Erosion • **Operational:** • Excavation from the wetlands leading to degraded wetlands. • Removal of substrate within wetlands. • Clearing of vegetation – vegetation loss. • Loss of biodiversity. • Vehicles driving in and through wetlands. • **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures • Vehicles driving in and through wetlands	• Other than approved and authorised structures, no other development or maintenance infrastructure is allowed within the delineated wetlands and 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 wetland 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. • All maintenance within wetlands must be restricted to the dry season. • 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 habitat 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.

Alteration of the amount of sediment entering the water resource and associated change in turbidity	• **Construction:** • Vegetation clearance causing sedimentation. • Earthworks activities. • Disturbance of soil surface and runoff characteristics. • Erosion • **Operational:** • Removal of substrate within wetlands. • Clearing of vegetation – vegetation loss. • Loss of biodiversity. • Vehicles driving in and through wetlands. • **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures • Vehicles driving in and through wetlands.	• Buffer zones should be maintained, in order to minimise sedimentation of the wetland areas. • No stockpiling should take place within a wetland 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 wetlands must be minimised through the effective stabilisation and the re-vegetation of any disturbed catchment areas. • 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. • 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 wetland structure and functions are reinstated in such a way as to ensure the ongoing functionality of the systems at pre-prospecting levels. • The duration of impacts on the wetland systems should be minimised as far as possible by ensuring that the duration of time in which habitat alteration and sedimentation will take place is minimised.
Alteration of water quality (during rainfall events)	• **Construction:** • Runoff from road surfaces. • Discharge of solvents, chemicals, and hydrocarbons. • **Operational:** • Maintenance of vehicles and machinery. • Runoff from road surfaces. • Discharge of sewage.	• Re-fuelling must take place on a sealed surface area, outside the delineated buffers, 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.

	• Discharge of solvents, chemicals, and hydrocarbons. • Excavation from the wetlands and the release of pollutants from disturbed soils. • Removal of substrate within wetlands. • **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures. • Vehicles driving in and through wetlands.	• 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 wetlands. • 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 wetlands, channels, and drainage lines. • Erosion and sedimentation into wetlands must be minimised through the effective stabilisation and the re-vegetation of any disturbed natural vegetation.
Loss of terrestrial habitat	• **Construction:** • Clearing of vegetation – vegetation loss. • **Operational:** • Removal of substrate within watercourses. • Clearing of vegetation during prospecting operations. • **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures. • Vehicles driving in and through wetlands.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas. • 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.
Loss of Aquatic Biota	• **Construction:** • Runoff from road surfaces • Sedimentation • Discharge of solvents, chemicals, and hydrocarbons. • **Operational:** • Maintenance of vehicles and machinery. • Runoff from road surfaces.	• **Identification, and if necessary, biomonitoring of aquatic organisms (Macroinvertebrates, Diatoms, and amphibian species) within the wetland systems is essential.**

	• Discharge of solvents, chemicals, and hydrocarbons. • Excavation from the wetlands and the release of nutrients and pollutants from disturbed soils. • Removal of substrate within wetlands. • Sedimentation	
Loss of Terrestrial Fauna	• **<u>Construction and Operational:</u>** • Vegetation loss and disturbance – clearing of vegetation. • Excessive noise disturbances • Illegal hunting. • Habitat fragmentation and destruction. • Vehicles driving through natural vegetated areas.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas. • 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 is 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	• **Construction and Operational:** • Vegetation clearance. • Vehicles driving through natural vegetated areas. • Habitat fragmentation and destruction.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas. • 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	• **Construction:** • Clearing of vegetation • **Operational:** • Removal of substrate within watercourses. • Clearing of vegetation during prospecting operations. • Vehicles driving in and through watercourses. • **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures • Vehicles driving in and through watercourses.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas. • 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. • Monitoring and management of invasive species should continue for at least two years after all prospecting and mining activities have ceased. • 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.

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.** • **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.**
Clearance of vegetation	Loss or fragmentation of habitats	Fauna & flora	Pitting and trenching phase-(construction and operation phase)	**Existing vegetation** 1. Vegetation removal must be limited to the prospecting area. 2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step. 3. No vegetation to be used for firewood. 4. Exotic and invasive plant species should not be allowed to establish, if the development is approved. **Rehabilitation** 5. All damaged areas shall be rehabilitated upon completion of the contract.	Minimisation of impacts to acceptable limits

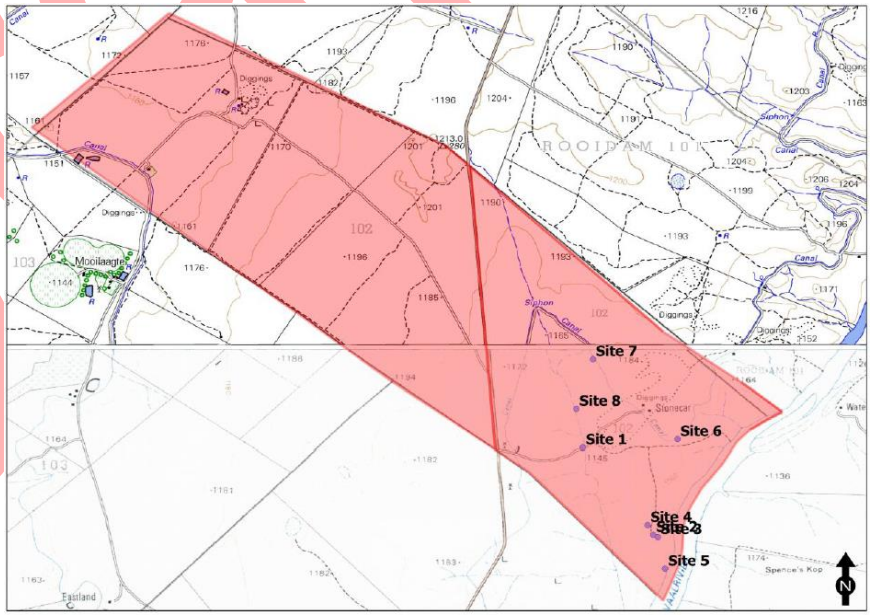
				6. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction. 7. All natural areas impacted during construction/prospecting must be rehabilitated with locally indigenous grasses typical of the representative botanical unit. 8. Rehabilitation must take place in a phased approach as soon as possible. 9. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding. 10. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas. 11. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged. **Demarcation of prospecting area** 12. All plants not interfering with prospecting operations shall be left undisturbed clearly marked and indicated on the site plan. 13. The prospecting area must be well demarcated and no construction/prospecting activities must be allowed outside of this demarcated footprint. 14. Vegetation removal must be phased in order to reduce impact of construction/prospecting. 15. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas. 16. Strict and regular auditing of the prospecting process to ensure containment of the prospecting and laydown areas. 17. Soils must be kept free of petrochemical solutions that may be kept on site during construction/prospecting. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora. **Utilisation of resources** 18. Gathering of firewood, fruit, muti plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO. **Exotic vegetation** 19. Alien vegetation on the site will need to be controlled.	

				20. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion. 21. The spread of exotic species occurring throughout the site should be controlled. **Herbicides** 22. Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used. 23. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation. **Fauna** 24. Rehabilitation to be undertaken as soon as possible after the prospecting activities have been completed. 25. No trapping or snaring to fauna on the construction/prospecting site should be allowed. 26. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development.	
Prospecting Diamonds Alluvial (DA) and Diamonds General (D) – excavations	Loss of topsoil	Soil	Pitting and trenching phase-(construction and operation phase)	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 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.	Minimisation of impacts to acceptable limits

				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. 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. • 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	Pitting and trenching phase-(construction and operation phase)	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. Wind screening and stormwater control should be undertaken to prevent soil loss from the site. 4. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion. 5. Other erosion control measures that can be implemented are as follows: o Brush packing with cleared vegetation o Mulch or chip packing o Planting of vegetation	Minimisation of impacts to acceptable limits

				○ Hydroseeding/hand sowing 6. Sensitive areas need to be identified prior to construction/prospecting so that the necessary precautions can be implemented. 7. All erosion control mechanisms need to be regularly maintained. 8. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces. 9. Retention of vegetation where possible to avoid soil erosion. 10. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time. 11. Re-vegetation of disturbed surfaces should occur immediately after construction/prospecting activities are completed. This should be done through seeding with indigenous grasses. 12. No impediment to the natural water flow other than approved erosion control works is permitted. 13. To prevent stormwater damage, the increase in stormwater run-off resulting from construction/prospecting activities must be estimated and the drainage system assessed accordingly. 14. Stockpiles not used in three (3) months after stripping must be seeded or backfilled to prevent dust and erosion.	
	Air Pollution	Air	Pitting and trenching phase-(construction and operation phase)	**Dust control** 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.	Minimisation of impacts to acceptable limits

				Odour control 9. Regular servicing of vehicles in order to limit gaseous emissions. 10. Regular servicing of onsite toilets to avoid potential odours. **Rehabilitation** 11. The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks. **Fire prevention** 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. 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.	
	Noise		Pitting and trenching phase-(construction and operation phase)	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. 2. Mine, 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. 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.	Minimisation of impacts to acceptable limits

				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. 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.	
	Impact on potential cultural and heritage artefacts	Heritage	Pitting and trenching phase-(construction and operation phase)	Site identified according to the preliminary Cultural Heritage Impact Assessment report (**Appendix 12**): *A total of eight heritage sites were recorded during the survey of which six are historical stone-walled structures (Sites 1, 2, 3, 6, 7 and 8), a grave (Site 4) and rock art (engraving (Site 5). The historical sites are probably associated with the late 19th century and early 20th century Korana people and/or farm worker accommodation keeping their own livestock.*  Location of the various recorded heritage sites	Minimisation of impacts to acceptable limits

- a 50meter buffer must be maintained between the Prospecting activities and below sites.

Locations and Evaluation of Sites

Table 7: Location and evaluation of sites

Site No	Coordinates	Site Type	Field Rating of Significance	Impact	Proposed Mitigation
1	28.261098°S 24.689057°E	Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
2	28.270507°S 24.696751°E	Small Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
3	28.270755°S 24.697259°E	Historical stone-walled settlement and livestock enclosures	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
4	28.269463°S 24.696134°E	Grave and Historical stone-walled livestock enclosure	Generally Protected A High significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
5	28.274193°S 24.698040°E	Rock Art	Local/Grade 3B High significance (mitigation required)	None	• Maintain a buffer zone of 50 metres during prospecting phase
6	28.260196°S 24.699383°E	Historical stone-walled livestock enclosures and houses	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
7	28.251502°S 24.690159°E	Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase
8	28.256895°S 24.688358°E	Historical stone-walled livestock enclosure	Generally Protected C Low significance	None	• Maintain a buffer zone of 50 metres during prospecting phase

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the NHRA, should these be discovered during construction activities

The following shall apply:

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible;

				• All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken; • 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).	
	Impact on potential fossils	Palaeontology	Pitting and trenching phase-(construction and operation phase)	The following procedure will only be followed if fossils are uncovered during the excavation phase of the development. 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". 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. 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 the environmental conditions that existed in a specific geographical area millions of years ago. This informational document is intended for workmen and foremen on construction sites. It describes the actions to be taken when mining or construction activities accidentally uncovers fossil material.	Minimisation of impacts to acceptable limits

				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. **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.	

				• 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.	
Waste management		Pollution	Pitting and trenching phase-(construction and operation phase)	**Litter management** 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 and wood and recycled. An independent contractor can be appointed to conduct this recycling. 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. **Hazardous waste**	Minimisation of impacts to acceptable limits

				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. **Sanitation** 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. **Remedial actions** 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. 26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.	

				27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure. 28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use. 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.	
Water Use and Quality	Water pollution	Water	Pitting and trenching phase-(construction and operation phase)	**Water Use** 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. 2. Water must be reused, recycled or treated where possible. **Water Quality** 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. 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. 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. **Stormwater** 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. The cut-off trenches and silt fences will be installed where necessary as to control runoff storm water by attenuating it and control the movement of sediment on the premises. These structures will be monitored on a regular basis. It is suggested that it be monitored on a weekly basis during the rainy season, and after possible rain events during the dry season. If these practices is found to be insufficient for the control of storm water and sedimentation, other alternatives should immediately be investigated and implemented. **Groundwater resource protection** 14. 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. 15. Prevent dirty water runoff from leaving the general mining area; 16. Compact the base of dirty areas, like the workshops and oil and diesel storage areas to minimise infiltration of poor-quality water to the underlying aquifers; 17. Enough supply of absorbent fibre should be kept at the site to contain accidental spills; 18. Contain dirty water in return water dams and re-use dirty water for dust suppression and make up water in the plant; 19. Proper storm water management should be implemented. Berms should also be constructed to ensure separation of clean water and dirty water areas; 20. A detailed mine closure plan should be prepared during the operational phase, including a risk assessment, water resource impact prediction etc. as stipulated in the DWS Best Practice Guidelines. The implementation of the mine closure plan,	

				and the application for the closure certificate can be conducted during the decommissioned phase. **Sanitation** 21. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers). 22. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution. **Concrete mixing** 23. 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. **Public areas** 24. 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. 25. 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. **26.** No washing or servicing of vehicles on site. **Infrastructure** 27. Infrastructure should adhere to the GN704 of the South African National Water Act (36 of 1998) and not be located within the 1:100- year Return Period flood line. This is essential for the safety of human life as well as for the protection of infrastructure from flood inundation and destruction.	

Mitigation measures according to the Terrestrial Biodiversity and Wetland Impact Assessment (**Appendix 12**):

Impact	Source of Impact	Recommended Mitigation Measures
Changing the physical structure within a water resource (habitat)	• **Construction:** • Infrastructure development within wetlands. • Loss of vegetation.	• Other than approved and authorised structures, no other development or maintenance infrastructure is allowed within the delineated wetlands and their associated buffer zones.

	• Erosion • **Operational:** • Excavation from the wetlands leading to degraded wetlands. • Removal of substrate within wetlands. • Clearing of vegetation – vegetation loss. • Loss of biodiversity. • Vehicles driving in and through wetlands. • **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures • Vehicles driving in and through wetlands	• 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 wetland 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. • All maintenance within wetlands must be restricted to the dry season. • 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 habitat 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.
Alteration of the amount of sediment entering the water resource and associated change in turbidity	• **Construction:** • Vegetation clearance causing sedimentation. • Earthworks activities. • Disturbance of soil surface and runoff characteristics. • Erosion • **Operational:** • Removal of substrate within wetlands. • Clearing of vegetation – vegetation loss. • Loss of biodiversity. • Vehicles driving in and through wetlands. • **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures • Vehicles driving in and through wetlands.	• Buffer zones should be maintained, in order to minimise sedimentation of the wetland areas. • No stockpiling should take place within a wetland 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 wetlands must be minimised through the effective stabilisation and the re-vegetation of any disturbed catchment areas. • 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. • 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 wetland structure and functions are reinstated in such a way as to ensure the ongoing functionality of the systems at pre-prospecting levels. • The duration of impacts on the wetland systems should be minimised as far as possible by ensuring that the duration of time in which habitat alteration and sedimentation will take place is minimised.
Alteration of water quality (during rainfall events)	• **Construction:** • Runoff from road surfaces. • Discharge of solvents, chemicals, and hydrocarbons. • **Operational:** • Maintenance of vehicles and machinery. • Runoff from road surfaces. • Discharge of sewage. • Discharge of solvents, chemicals, and hydrocarbons. • Excavation from the wetlands and the release of pollutants from disturbed soils. • Removal of substrate within wetlands. • **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures. • Vehicles driving in and through wetlands.	• Re-fuelling must take place on a sealed surface area, outside the delineated buffers, 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 wetlands. • 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 wetlands, channels, and drainage lines. • Erosion and sedimentation into wetlands must be minimised through the effective stabilisation and the re-vegetation of any disturbed natural vegetation.
Loss of terrestrial habitat	• **Construction:** • Clearing of vegetation – vegetation loss. • **Operational:** • Removal of substrate within watercourses. • Clearing of vegetation during prospecting operations. • **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas. • 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.

	• Vehicles driving in and through wetlands.	
Loss of Aquatic Biota	• **Construction:** • Runoff from road surfaces • Sedimentation • Discharge of solvents, chemicals, and hydrocarbons. • **Operational:** • Maintenance of vehicles and machinery. • Runoff from road surfaces. • Discharge of solvents, chemicals, and hydrocarbons. • Excavation from the wetlands and the release of nutrients and pollutants from disturbed soils. • Removal of substrate within wetlands. • Sedimentation	• **Identification, and if necessary, biomonitoring of aquatic organisms (Macroinvertebrates, Diatoms, and amphibian species) within the wetland systems is essential.**
Loss of Terrestrial Fauna	• **Construction and Operational:** • Vegetation loss and disturbance – clearing of vegetation. • Excessive noise disturbances • Illegal hunting. • Habitat fragmentation and destruction. • Vehicles driving through natural vegetated areas.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas. • 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 is 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	• **<u>Construction and Operational:</u>** • Vegetation clearance. • Vehicles driving through natural vegetated areas. • Habitat fragmentation and destruction.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas. • 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	• **<u>Construction:</u>** • Clearing of vegetation • **<u>Operational:</u>** • Removal of substrate within watercourses. • Clearing of vegetation during prospecting operations. • Vehicles driving in and through watercourses. • **<u>Decommissioning:</u>** • Damage to vegetated areas. • Ineffective rehabilitation measures • Vehicles driving in and through watercourses.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas. • 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. • Monitoring and management of invasive species should continue for at least two years after all prospecting and mining activities have ceased. • 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.

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

(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).	**(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**(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..**	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.	(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)
Clearance of vegetation	Loss or fragmentation of habitats	**Existing vegetation** 1. Vegetation removal must be limited to the prospecting site. 2. Vegetation to be removed as it becomes necessary rather than removal of all vegetation throughout the site in one step. 3. No vegetation to be used for firewood. 4. Exotic and invasive plant species should not be allowed to establish, if the development is approved. **Rehabilitation** 5. All damaged areas shall be rehabilitated upon completion of the contract. 6. Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to construction.	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.

		7. All natural areas impacted during construction/prospecting must be rehabilitated with locally indigenous grasses typical of the representative botanical unit. 8. Rehabilitation must take place in a phased approach as soon as possible. 9. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding. 10. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas. 11. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged. **Demarcation of prospecting area** 12. All plants not interfering with prospecting operations shall be left undisturbed clearly marked and indicated on the site plan. 13. The prospecting area must be well demarcated and no construction activities must be allowed outside of this demarcated footprint. 14. Vegetation removal must be phased in order to reduce impact of construction/prospecting. 15. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas. 16. Strict and regular auditing of the prospecting process to ensure containment of the prospecting and laydown areas. 17. Soils must be kept free of petrochemical solutions that may be kept on site during construction/prospecting. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora. **Utilisation of resources** 18. Gathering of firewood, fruit, muti plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ECO. **Exotic vegetation** 19. Alien vegetation on the site will need to be controlled. 20. The Contractor should be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.		

		21. The spread of exotic species occurring throughout the site should be controlled. **Herbicides** 22. Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only environmentally friendly herbicides shall be used. 23. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation. **Fauna** 24. Rehabilitation to be undertaken as soon as possible after prospecting has been completed. 25. No trapping or snaring to fauna on the construction/prospecting site should be allowed. 26. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development.		

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	• **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures • Vehicles driving in and through wetlands	• The duration of impacts on the wetland systems should be minimised as far as possible by ensuring that the duration of time in which habitat 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.
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Alteration of water quality (during rainfall events)	• **Construction:** • Runoff from road surfaces. • Discharge of solvents, chemicals, and hydrocarbons. • **Operational:** • Maintenance of vehicles and machinery.	• Re-fuelling must take place on a sealed surface area, outside the delineated buffers, 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.

	• Runoff from road surfaces. • Discharge of sewage. • Discharge of solvents, chemicals, and hydrocarbons. • Excavation from the wetlands and the release of pollutants from disturbed soils. • Removal of substrate within wetlands. • **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures. • Vehicles driving in and through wetlands.	• 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 wetlands. • 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 wetlands, channels, and drainage lines. • Erosion and sedimentation into wetlands must be minimised through the effective stabilisation and the re-vegetation of any disturbed natural vegetation.
Loss of terrestrial habitat	• **Construction:** • Clearing of vegetation – vegetation loss. • **Operational:** • Removal of substrate within watercourses. • Clearing of vegetation during prospecting operations. • **Decommissioning:** • Damage to vegetated areas. • Ineffective rehabilitation measures. • Vehicles driving in and through wetlands.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas. • 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.
Loss of Aquatic Biota	• **Construction:** • Runoff from road surfaces • Sedimentation • Discharge of solvents, chemicals, and hydrocarbons. • **Operational:** • Maintenance of vehicles and machinery. • Runoff from road surfaces. • Discharge of solvents, chemicals, and hydrocarbons.	• **Identification, and if necessary, biomonitoring of aquatic organisms (Macroinvertebrates, Diatoms, and amphibian species) within the wetland systems is essential.**

	• Excavation from the wetlands and the release of nutrients and pollutants from disturbed soils. • Removal of substrate within wetlands. • Sedimentation	
Loss of Terrestrial Fauna	• **<u>Construction and Operational:</u>** • Vegetation loss and disturbance – clearing of vegetation. • Excessive noise disturbances • Illegal hunting. • Habitat fragmentation and destruction. • Vehicles driving through natural vegetated areas.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas. • 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 is 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	• **<u>Construction and Operational:</u>** • Vegetation clearance. • Vehicles driving through natural vegetated areas.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas.

	• Habitat fragmentation and destruction.	• 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	• **<u>Construction:</u>** • Clearing of vegetation • **<u>Operational:</u>** • Removal of substrate within watercourses. • Clearing of vegetation during prospecting operations. • Vehicles driving in and through watercourses. • **<u>Decommissioning:</u>** • Damage to vegetated areas. • Ineffective rehabilitation measures • Vehicles driving in and through watercourses.	• No prospecting or mining activities are to occur in any CBA 1 or CBA 2 areas. • 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. • Monitoring and management of invasive species should continue for at least two years after all prospecting and mining activities have ceased. • 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.

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 Declared invader plant species	• Conduct regular internal audits • Conduct regular external audits	• 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 of Diamonds Alluvial (DA) and Diamonds General (D) – excavations	Loss of topsoil Erosion Air Pollution Noise Impact on potential cultural and heritage artefacts Declared invader plant species	• Conduct regular internal audits • Conduct regular external audits	• 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	• Conduct regular internal audits • Conduct regular external audits	• 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	• Conduct regular internal audits • Conduct regular external audits	• 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. A PROGRAM FOR REPORTING ON COMPLIANCE, TAKING INTO ACCOUNT THE REQUIREMENTS AS BY THE REGULATIONS;

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. AN ENVIRONMENTAL AWARENESS PLAN DESCRIBING THE MANNER IN WHICH—

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

Morgenson Mining (Pty) Ltd 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

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

Morgenson Mining (Pty) Ltd 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.

************END OF THE REPORT************