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ENVIRONMENTAL IMPACT ASSESSMENT REPORT & ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR:

The proposed Prospecting Right combined with a Waste Licence application to prospect for Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) on the Remaining Extent, Portion 1, Portion 2 and Portion 3 (Boorwater) of the farm Bultfontein 327, Registration Division: Hay, Northern Cape Province.

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Table of Contents

PROJECT INFORMATION	3
IMPORTANT NOTICE	4
ENVIRONMENTAL IMPACT ASSESSMENT PROCESS	5
OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS.....	5
SCOPE OF ASSESSMENT AND CONTENT OF ENVIRONMENTAL IMPACT ASSESSMENT REPORTS	6
A. CONTACT PERSON AND CORRESPONDENCE ADDRESS	6
B. DESCRIPTION OF THE PROPERTY	6
C. LOCALITY MAP	7
D. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY.....	8
E. POLICY AND LEGISLATIVE CONTEXT	16
F. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.....	23
G. A MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT	23
H. A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT	24
i) Details of the development footprint alternatives considered;.....	24
ii) Details of the Public Participation Process Followed	27
iii) Summary of Issues Raised by I&APs.....	30
iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;.....	33
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—	60
vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	60
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;	63
viii) the possible mitigation measures that could be applied and level of residual risk;	63
ix) if no alternative development [location] footprints for the activity were investigated, the motivation for not considering such; and.....	63
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;	63
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	64
J. AN ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK, INCLUDING—.....	70
K. SUMMARY OF THE FINDINGS AND RECOMMENDATIONS OF ANY SPECIALIST REPORT	85
L. AN ENVIRONMENTAL IMPACT STATEMENT WHICH CONTAINS—.....	91
M. PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR	94
N. FINAL PROPOSED ALTERNATIVES.....	95
O. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION.....	95
P. DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE.....	95
Q. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED	95
R. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED.....	96

S.	AN UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP IN RELATION TO:.....	96
T.	FINANCIAL PROVISION	97
U.	DEVIATIONS FROM THE APPROVED SCOPING REPORT AND PLAN OF STUDY	98
V.	ANY SPECIFIC INFORMATION THAT MAY BE REQUIRED BY THE COMPETENT AUTHORITY; AND	98
W.	COMPLIANCE WITH THE PROVISIONS OF SECTIONS 24(4)(A) AND (B) OF THE ACT	98
	ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT	102
A.	DETAILS OF-	102
B.	DESCRIPTION OF THE ASPECTS OF THE ACTIVITY	102
C.	COMPOSITE MAP	103
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—.....	104
E.	A DESCRIPTION AND IDENTIFICATION OF IMPACT MANAGEMENT OUTCOMES REQUIRED FOR THE ASPECTS CONTEMPLATED IN PARAGRAPH (D);]	105
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 —	106
G.	MONITORING OF IMPACT MANAGEMENT ACTIONS.....	157
H.	MONITORING AND REPORTING FREQUENCY	157
I.	RESPONSIBLE PERSONS	157
J.	TIME PERIOD FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS.....	157
K.	MECHANISM FOR MONITORING COMPLIANCE.....	157
L.	A PROGRAM FOR REPORTING ON COMPLIANCE, TAKING INTO ACCOUNT THE REQUIREMENTS AS BY THE REGULATIONS;.....	162
M.	AN ENVIRONMENTAL AWARENESS PLAN DESCRIBING THE MANNER IN WHICH—	162
N.	SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY	162

PROJECT INFORMATION

Project Name: Application for an Environmental Authorisation for the proposed Prospecting Right combined with a Waste Licence application to prospect for Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) on the Remaining Extent, Portion 1, Portion 2 and Portion 3 (Boorwater) of the farm Bultfontein 327, Registration Division: Hay, Northern Cape Province.

Report Title: EIR & EMPr

Prepared By: Milnex CC

Date: 25/03/2022

QUALITY CONTROL:

	Report Author:	Report Reviewer:
Name:	Lizanne Esterhuizen Honours Degree in Environmental Science	N/A
Signature:		

DISCLAIMER:

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

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

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 uninterpreted 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
Ms. Percy Sehaole Pr.Sci.Nat	Master's Degree in Environmental Science (refer to Appendix 1)	Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: percy@milnex-sa.co.za
Mr. 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

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 the proposed Prospecting Right combined with a Waste Licence application to prospect for Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) on the Remaining Extent, Portion 1, Portion 2 and Portion 3 (Boorwater) of the farm Bultfontein 327, Registration Division: Hay, 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.

Percy Sehaole, Lizanne Esterhuizen & Christiaan Baron have 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 the farm Bultfontein 327 2) Portion 1 of the farm Bultfontein 327 3) Portion 2 of the farm Bultfontein 327 4) Portion 3 (Boorwater) of the farm Bultfontein 327
Application area (Ha)	5474.2388 ha
Magisterial district:	Pixley Ka Seme District Municipality
Local Municipality	Siyathemba Local Municipality
Registration Division	Hay
Distance and direction from nearest town	The property is located approximately 34.7km West of Niekerkshoop in the Northern Cape Province.
21 digit Surveyor General Code for each farm portion	1) C0310000000032700000 2) C0310000000032700001 3) C0310000000032700002 4) C0310000000032700003
Minerals Applied for	<ul style="list-style-type: none"> Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK)

iii. Farm co-ordinates

Farms	Longitude	Latitude
1) The Remaining extent of the farm Bultfontein 327	22° 25' 37.804" E	29° 20' 42.585" S
2) Portion 1 of the farm Bultfontein 327	22° 25' 39.035" E	29° 24' 11.890" S
3) Portion 2 of the farm Bultfontein 327	22° 29' 4.646" E	29° 23' 49.728" S
4) Portion 3 (Boorwater) of the farm Bultfontein 327	22° 30' 24.674" E	29° 20' 9.343" S
	22° 29' 29.270" E	29° 17' 55.142" S

C. LOCALITY MAP

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

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

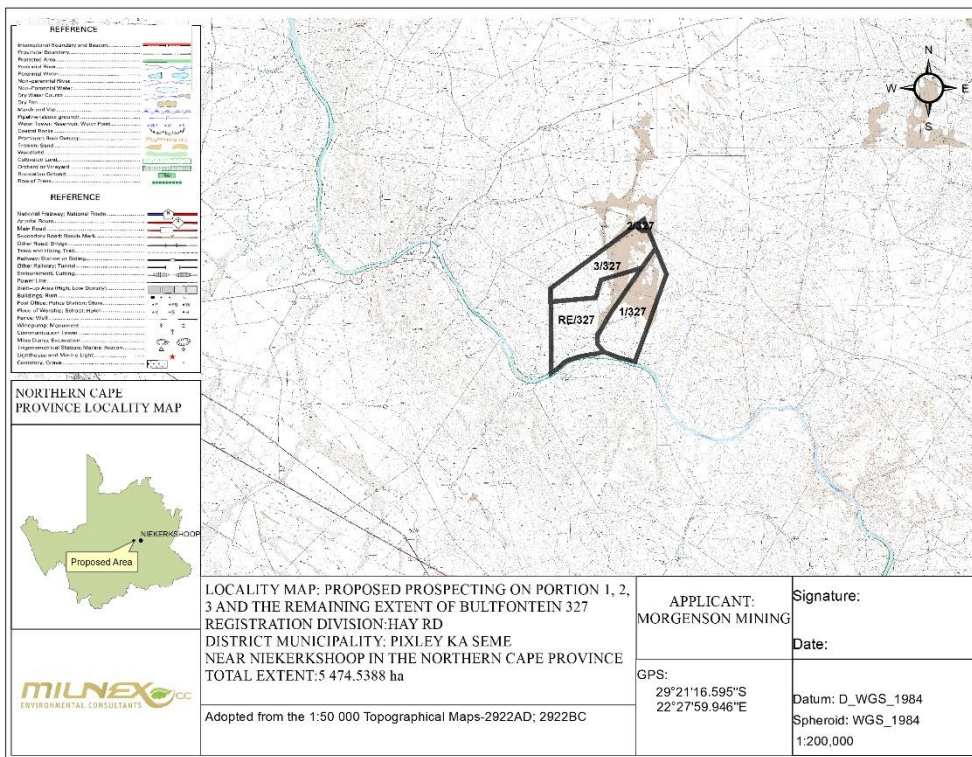


Figure 1: Locality Map

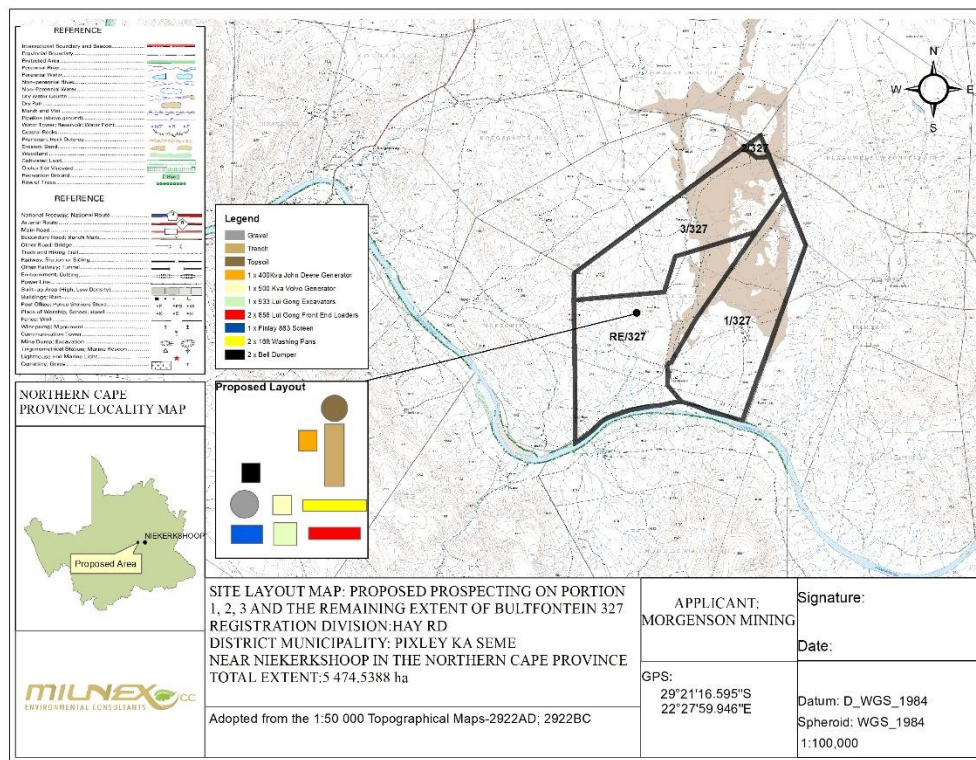


Figure 2: Site Plan

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)	<ol style="list-style-type: none"> 1) Listing notice 1 (GNR327), Activity 9: <i>"The development of infrastructure exceeding 1 000 metres 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;"</i> 2) Listing notice 1 (GNR 327), Activity 10: <i>"The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;"</i> 3) Listing Notice 1 (GNR 327), Activity 19: <i>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from: (i) a watercourse;</i> 4) Listing Notice 1 (GNR 327), Activity 20: <i>"Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] (b) the primary processing of a petroleum resource including winning, extraction, classifying, concentrating or water removal; –</i> 5) Listing Notice 1 (GNR 327), Activity 27: <i>"The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation"</i>
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	<p>6) Listing Notice 2 (GNR 325), Activity 19: <i>“The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource or (b) [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;</i></p> <p>7) Listing Notice 3 (GNR 324), Activity 12: <i>The clearance of an area of 300 square metres or more of indigenous vegetation (g) Northern Cape (ii) Within critical biodiversity areas identified in bioregional plans;”</i></p> <p><u>NEM:WA 59 of 2008:</u></p> <p>8) Residue stockpiles or residue deposits, Category A: (15) <i>The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</i></p> <p>Prospecting right with bulk samples for the prospecting of Diamond (Alluvial), Diamond (General) & Diamond (In Kimberlite) including associated infrastructure, structure and earthworks.</p>
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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 m ²	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)
Bulk transportation of water or storm water: BULK SAMPLING: Application area: 5474.2388 Ha Pits: 90 pits estimated dimensions of 3m x 3m x 4m Trenches: 45 trenches with estimated dimensions of 40m x 40m x 3m Listing notice 1, GNR327: Activity 9: The development of infrastructure exceeding 1 000 metres 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		X	Listing Notice 1 (GNR 327), Activity 9	
Bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes: BULK SAMPLING: Application area: 5474.2388 Ha Pits: 90 pits estimated dimensions of 3m x 3m x 4m Trenches: 45 trenches with estimated dimensions of 40m x 40m x 3m Listing notice 1, GNR 327: Activity 10: The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;		X	Listing Notice 1 (GNR 327), Activity 10	
Prospecting Right: BULK SAMPLING: Application area: 5474.2388 Ha Pits: 100 pits estimated dimensions of 4m x 2m x 3m Trenches: 50 trenches with estimated dimensions of 40m x 40m x 3m		X	Listing Notice 1 (GNR 327), Activity 19	-

<p>Listing Notice 1: GNR 327, Activity 19: <i>The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from:</i> i) a watercourse;</p>				
<p>Prospecting Right:</p> <p><u>BULK SAMPLING:</u> Application area: 5474.2388 Ha Pits: 90 pits estimated dimensions of 3m x 3m x 4m Trenches: 45 trenches with estimated dimensions of 40m x 40m x 3m</p> <p>Bulk sample of 158 400 tonnes</p> <p>Listing Notice 1, GNR 325, Activity 20: <i>“Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including—</i> <i>(a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]</i> <i>(b) the primary processing of a petroleum resource including winning, extraction, classifying, concentrating or water removal</i></p>	<p>Random indigenous vegetation clearance of over a 5474.2388 hectares area.</p> <p>Concurrent backfilling will take place in order to rehabilitate</p>	<p>X</p>	<p>Listing Notice 1 (GNR 327), Activity 20</p>	<p>-</p>
<p>Clearance of indigenous vegetation:</p> <p><u>BULK SAMPLING:</u> Application area: 5474.2388 Ha Pits: 90 pits estimated dimensions of 3m x 3m x 4m Trenches: 45 trenches with estimated dimensions of 40m x 40m x 3m</p> <p>Listing Notice 1, GNR 327, Activity 27: <i>“The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation.”</i></p>	<p>Random indigenous vegetation clearance of over a 5474.2388 hectares area.</p> <p>Concurrent backfilling will take place in order to rehabilitate</p>	<p>X</p>	<p>Listing Notice 1 (GNR 327), Activity 27</p>	<p>-</p>

<p>Prospecting:</p> <p>BULK SAMPLING: Application area: 5474.2388 Ha Pits: 90 pits estimated dimensions of 3m x 3m x 4m Trenches: 45 trenches with estimated dimensions of 40m x 40m x 3m</p> <p>Listing Notice 2 GNR 325, Activity 19: <i>"The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including—</i> <i>(a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource [,]; or</i> <i>(b) [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing</i></p>	<p>Random indigenous vegetation clearance of over a 5474.2388 hectares area.</p> <p>Concurrent backfilling will take place in order to rehabilitate</p>	<p>X</p>	<p>Listing Notice 2 (GNR 325), Activity 19:</p>	<p>-</p>
<p>Clearance of indigenous vegetation:</p> <p>BULK SAMPLING: Application area: 5474.2388 Ha Pits: 90 pits estimated dimensions of 3m x 3m x 4m Trenches: 45 trenches with estimated dimensions of 40m x 40m x 3m</p> <p>Listing Notice 3 (GNR 324), Activity 12: "The clearance of an area of 300 square metres or more of indigenous vegetation. (g) Northern Cape (ii) Within critical biodiversity areas identified in bioregional plans;"</p>	<p>Random indigenous vegetation clearance of over a 5474.2388 hectares area.</p> <p>Concurrent backfilling will take place in order to rehabilitate</p>	<p>X</p>	<p>Listing Notice 3 (GNR 324), Activity 12 (g)(ii)</p>	<p>-</p>
<p>NEM:WA 59 of 2008: Residue stockpiles or residue deposits, Category A: (15): <i>The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</i></p>	<p>Random indigenous vegetation clearance of over a 5474.2388 hectares area.</p> <p>Concurrent backfilling will take place in order to rehabilitate</p>	<p></p>	<p>NEM:WA 59 of 2008 Category A: (15)</p>	<p>-</p>

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 combined with a Waste Licence application to prospect for Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) on the Remaining Extent, Portion 1, Portion 2 and Portion 3 (Boorwater) of the farm Bultfontein 327, Registration Division: Hay, Northern Cape Province. These farms/portions 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 mine diamonds within the Siyathemba Local Municipality in the 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

Phase 1 – Site Visits

The applicant will appoint Pierre de Jager as the project geologist to conduct the site visit. A formal site visit will be done within 90 days after the prospecting right has been executed. It is foreseen that more than one site visit will be conducted on the farms.

The purpose of the site visit is to assist the applicant to be familiar with the environment and with the assessment of the topography and the general geology before invasive prospecting activities. During this process the applicant will also review all documentation that has been received in relation to the geology of the area.

Phase 2 – Desktop Studies

Desktop studies will be undertaken after a site investigation is 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.

This phase involves reviewing the literature surveys, interpretation of aerial photographs, satellite images and ground validation of targets. A preliminary analysis of the environment will be obtained which will improve the project's efficiency and cost by providing a clearer understanding of the challenges may be encountered. Compilation of the results of analysis will be done by the geologist after the finalization of the desktop studies.

Phase 3 – Pitting

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

To dig the pits the applicant will make use of the systems of Pierre de Jager, the appointed project geologist.

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

- A description of the soil and rock types from ground level to the base of the pits;
- Record of rock head depth and refusal depth, a list of where the samples will be taken, a record of where ground water seepage will be recorded;
- A general note of the geology and conditions in the vicinity of the test pits
- Pitting will be done within the period of 24 months once the prospecting right has been granted.

Calculations

It is planned that 90 pits will be dug (it may be less depending on the results) at an extent of 3m (length) x 3m (breadth) x 4m (depth).

- $90 \text{ pits} / 2 \text{ years} = 45 \text{ pits dug per year}$
- $\text{Total area to be disturbed per year} = 45 \text{ pits} \times (3\text{m} \times 3\text{m}) / 10\,000 = 0.04\text{Ha disturbed per year}$
- $\text{Total area disturbed for 24 months} = 90 \text{ pits} \times (3\text{m} \times 3\text{m}) / 10\,000 = 0.081 \text{ Ha disturbed}$

Phase 4 – Trenches

Due to nature of the alluvial diamond deposit, samples are not taken for assay as would be normal practice to evaluate hard rock precious or base-metal prospects. The diamond distribution pattern grade of alluvial diamonds is also of such a nature that there is no repeatability of sample results, even from adjacent samples.

Bulk samples will have to be taken to determine the average sample grade. By taking of the bulk samples, the applicant foresees to determine the grade of the diamond deposits as the number of carats contained in 100 tons (cpht) of gravel and to determine the average diamond sizes.

During these activities the applicant will then find out the size and value distribution of trenches. Diamond distribution patterns of alluvial deposits varies to such a nature that there is no repeatability of sample results even from adjacent samples.

Alluvial diamond deposits can only be sampled through bulk sampling comprising thousands of cubic meters of gravel. Given the extent of the area and the grades expected to be very low, the applicant will have to process bulk samples of approximately 158 400 tonnes.

The appointed geologist will advise where the samples will be taken. Bulk samples will not be taken along a systematic grid as in the case of drilling. As the anticipated mining plan for the properties will be based on high volumes (low grades), the bulk samples will have to address average recovery.

As indicated, the bulk sampling exercise has to be conducted to determine the grades (cpht), the diamond size distribution and thereafter to sell the diamonds to determine the diamond values.

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

The bulk sampling operation will be conducted using a fleet of conventional open pit mining equipment comprising of dump trucks supported by appropriate excavators and front-end loaders. All equipment is planned to be diesel driven.

Before excavation commences vegetation will be cleared from the proposed bulk sampling block. These will be done as per environmental regulations. Top soil will then be removed and stored separately for later used for rehabilitation.

The bulk samples will be made in the form of box cuts the dimensions of these individual box cuts will on average be 40m long x 40m wide.

It is estimated that the bulk samples will be 3 m in depth.

Gravel will be removed by excavators and will be loaded directly into dump trucks. Ore will be hauled to the screening plant. The material will be screened where after the screened material will be moved to the processing plant where the gravel will be processed. Concentrate will be moved to the sorting plant where the concentrate will be sorted.

It is estimated that pitting and trenching will take approximately 48 months.

Calculations

It is planned that 45 trenches will be dug at an extent of 40m (length) x 40m (breadth) x 3m (depth).

- 45 trenches / 2 years = 22.5 trenches dug per year
- Total area to be disturbed per month = 22.5 trenches x (40m x 40m) / 10 000 = 3.6 Ha disturbed per year.
- Total area disturbed for 48 months = 45 trenches x (40m x 40m) / 10 000 = 7.2 Ha disturbed

Phase 5 – Consolidation and Interpretation of Results Data

The prospecting activities will be conducted to determine an inferred diamond resource and an indicated diamond resource. An inferred diamond resource has a lower level of confidence than that applying to an indicated diamond resource. The inferred resource indication will be where the geological and or grade continuity could not be confidently interpreted. It cannot be assumed that an inferred resource will necessarily be upgraded to an indicated resource. Such a resource is normally also not sufficient to enable an evaluation of economic viability.

To obtain an indicated resource the confidence level of information obtained from the prospecting will have to be sufficient for the information to be applied to mine design, mine planning to enable an evaluation of economic viability.

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

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

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

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 be needed in case there will be encroachment on any watercourses. When needed 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 2 x 16 feet washing pans will be used, the amount of water for the pans will be 34 000 L/hour from which 30% is re-used.

Dust suppression

Unacceptable levels of dust fallout can be determined by implementing dust management by 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/m ² /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 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.

Road

Access will be obtained from existing gravel roads.

List of equipment's & infrastructure

List of equipment
1 x 400 Kva John Deere Generator
1 x 500 Kva Volvo Generator
1 x 933 Lui Gong Excavators
2 x 856 Lui Gong Front End Loaders
2 x 16ft Washing pans
2 x Bell Dumper
1 x Finlay 883 Screen

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		
Pixley Ka Seme District Municipality Integrated Development Plan (IDP)	Municipal	
Siyathemba 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	<p>The Constitution is the supreme law of the Republic and all law and conduct must be consistent with the Constitution. The Chapter on the Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment. Section 24 of the Constitution of the Republic of South Africa (Act 108 of 1996) states the following:</p> <p><i>“Everyone has the right –</i></p> <p><i>(a) to an environment that is not harmful to their health or well-being; and</i></p> <p><i>(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –</i></p> <p><i>i) prevent pollution and ecological degradation;</i></p> <p><i>ii) promote conservation; and</i></p> <p><i>iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</i></p> <p>The Constitution therefore, compels government to give effect to the people’s environmental right and places government under a legal duty to act as a responsible custodian of the countries environment. It compels government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development.</p>
National Environmental Management Act No. 107 of 1998 as amended.	S24(1) of NEMA S28(1) of NEMA	<p>NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information; polluter pays; subsidiary; waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice.</p> <p>The mandate for EIA lays with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 326, 327, 325, and 324 promulgated in terms of Section 24 of NEMA. The EIA Regulations determine that an Environmental Authorisation is required for certain listed activities, which might have a detrimental effect on the environment.</p>
EIA regulations as amended under NEMA	Listing notice 1 Listing notice 2 Listing Notice 3	<p>The National Environmental Management 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.</p>

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

<p>National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004).</p>	<p>Section 21</p>	<p>The object of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development.</p> <p>Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1) (a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed development.</p>
<p>National Water Act, 1998 (Act No. 36 of 1998).</p>	<p>Section 21</p>	<p>Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. The intention of the Act is to promote the equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply and sanitation, and environmentally, it provides for the protection of aquatic and associated ecosystems, the reduction and prevention of pollution and degradation of water resources.</p> <p>As this Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, a person can only be entitled to use water if the use is permissible under the Act. Chapter 4 of the Act lays the basis for regulating water use.</p>
<p>National Forest Act (Act 84 of 1998) (NFA)</p>	<p>Regulation 7</p>	<p>The protection, sustainable management and use of forests and trees within South Africa are provided for under the National Forests Act (Act 84 of 1998).</p> <p>Regulation 7 from the Act states the following:</p> <p>Prohibition on destruction of trees in natural forests.</p> <p>(1) No person may -</p> <p>(a) cut, disturb, damage or destroy any indigenous tree in a natural forest; or</p> <p>(b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any tree, or any forest product derived from a tree contemplated in paragraph (a), except in terms of-</p> <p>(i) a licence issued under subsection (4) or section 23; or</p> <p>(ii) an exemption from the provisions of this subsection published by the Minister in the Gazette on the advice of the Council.</p>
<p>National Veld & Forest Fires Act (Act 101 of 1998)</p>	<p>Regulation 13 Chapter 5</p>	<p>The purpose of the Act is to prevent and combat veld, forest and mountain fires throughout the Republic and provides for a variety of institutions, methods and practices for achieving the purpose. Regulations 13 provides the requirement for firebreaks. Chapter 5 places a duty on all owners to acquire equipment and have available personnel to fight fires.</p>

<p>Conservation of Agricultural Resources Act (Act No. 85 of 1983)</p>		<p>The purpose of the Act is to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.</p> <p>The objects of this Act are to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants.</p>
<p>National Infrastructure Plan</p>		<p>The National Government adopted a National Infrastructure Plan in 2012. With the plan they aim to transform the South African economic landscape while simultaneously creating significant numbers of new jobs, and strengthening the delivery of basic services.</p> <p>Government will over the three years from 2013/14 invest R827 billion in building and upgrading existing infrastructure.</p> <p>These investments will improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. On the other hand, investments in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to faster economic growth.</p> <p>This mining activity will indirectly contribute to the growing of the South African economy by supplying SANRAL with material to build and upgrade road infrastructure.</p>
<p>District Municipality Integrated Development Plan (IDP)</p>		<p>The IDP and SDFs of the relevant municipalities was examined and relevant information was included in the EIA report.</p>
<p>Local Municipality Integrated Development Plan (IDP)</p>		<p>The IDP and SDFs of the relevant municipalities was examined and relevant information was included in the EIA report.</p>
<p>National Environmental Management: Protected Areas Act 57 of 2003</p>		<p>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.</p>
<p>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</p>		<p>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.</p>

<p>Hazardous Substances Act (No. 15 of 1979)</p>		<p>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.'</p> <p>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.</p>
<p>Subdivision of Agricultural Land Act (No. 70 of 1970)</p>		<p>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.</p>
<p>Occupational Health and Safety Act (No. 85 of 1993)</p>		<p>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.</p> <p>The OHSA is applicable and states that any person involved with construction, upgrades or developments for use at work or on any premises shall ensure as far as reasonably practicable that nothing about the manner in which it is installed, erected or constructed makes it unsafe or creates a risk to health when properly used</p>
<p>Mine Health and Safety Act (No. 29 of 1996)</p>		<p>The Mine Health and Safety Act (No. 29 of 1996) (MHSA) aims to protect and promote the health and safety of employees and persons that may be affected by the activities at a mine and outlines both the rights and responsibilities of an employer, as well as the obligations of employees working thereat.</p> <p>The following principles are considered applicable to the Proposed Project and are detailed below:</p> <ul style="list-style-type: none"> • The primary responsibility for ensuring a health and safe working environment in the mining site is placed on the mine owner. The Act sets out in detail the steps that employers must take to identify, assess records and control health and safety hazards in the mine; • The right of workers to participate in health and safety decisions, the right to receive health and safety information, the right to training and the right to withdraw from the workplace in face of danger; • The Act requires the establishment of institutions to promote a culture of health and safety and develop policy, legislation and regulations; and • The responsibility for enforcing MHSA lies with the Mine Health and Safety Inspectorate. The Inspectorate's powers are recast and include the power to impose administrative fines upon employers who contravene the MHSA. <p>The Act also contains innovative approaches to the investigation of accidents, diseases and other occurrences that threaten health and safety.</p>
<p>Government Notice Regulation 704 of 1999</p>		<p>GNR.704 of 1999 under the NWA provides regulations on the use of water for mining and related activities aimed at the protection of water resources (requirements for clean and dirty water separation). GNR.704 requires inter alia the following:</p> <ul style="list-style-type: none"> • Separation of clean (unpolluted) water from dirty water; • Collection and confinement of the water arising within any dirty area into a dirty water system; • Design, construction, maintenance and operation of the clean water and dirty water management systems so that it is not likely for either system to spill into the other more than once in 50 years; • Design, construction, maintenance and operation of any dam that forms part of a dirty water system to have a minimum freeboard of 0.8m above full supply level, unless otherwise specified in terms of Chapter 12 of the Act; and

		<ul style="list-style-type: none">• Design, construction, and maintenance of all water systems in such a manner as to guarantee the serviceability of such conveyances for flows up to and including those arising as a result of the maximum flood with an average period of recurrence of once in 50 years. <p><u>GNR.704 also stipulates that no person in control of a mine or activity may:</u> Locate or place any residue deposit, dam, reservoir, together with any associated structure or any other facility within the 1:100 year flood line or within a horizontal distance of 100 m from any watercourse or estuary, borehole or well, excluding boreholes or wells drilled specifically to monitor the pollution of groundwater, or on water-logged ground, or on ground likely to become water-logged, undermined, unstable or cracked;</p> <p>Place or dispose of any residue or substance which causes or is likely to cause pollution of a water resource, in the workings of any underground or opencast mine excavation, prospecting diggings, pit or any other excavation; or</p> <p>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.</p>
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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;).

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 possibility of shallow diamond.

As discussed in the previous section, based on outcomes of previous studies in the vicinity of the proposed site, the possibility to encounter volumes of Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) on the Remaining Extent, Portion 1, Portion 2 and Portion 3 (Boorwater) of the farm Bultfontein 327, Registration Division: Hay, Northern Cape Province, was identified.

According to **Figure 20 and Figure 21** the proposed area is mostly covered in natural vegetation and a small area is used for cultivation. The proposed area also borders the Orange river.

Preferred activity

The prospecting of Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) is the optimum preferred activity for the site. The shallow diamond deposits make the site ideal for alluvial diamond mining.

According to **Figure 20 and Figure 21** the proposed area is mostly covered in natural vegetation and a small area is used for cultivation. The proposed area also borders the Orange river.

Technology

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.

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. No other properties have been secured by **Morgenson Mining (Pty) Ltd** near Christiana area to potentially mine the applied for minerals. Also, it is expected that the Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) been deposited on this farm and therefore the applicant would like to commence with their prospecting activities.

Land capability

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

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

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

The proposed area falls within Land in Class VII (7) and VIII (8). (refer to Land capability map on **figure 6** and attached as **Appendix 5**).

• Activity alternatives

The environmental impact assessment process also needs to consider if the development of a 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 Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK).

According to **Figure 20** and **Figure 21** the proposed area is mostly covered in natural vegetation and a small area is used for cultivation. The proposed area also borders the Orange river.

- **Design and layout alternatives**

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.

According to **Figure 20 and Figure 21** the proposed area is mostly covered in natural vegetation and a small area is used for cultivation. The proposed area also borders the Orange river.

- **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 purpose of soil sampling. If gravel is found, the applicant will determine 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 prospecting activity, will be to 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.

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.

PUBLIC PARTICIPATION PLAN

Below is a plan Milnex CC used for this application in order to ensure that reasonable opportunity was provided for public participation and that all administrative actions were reasonable for the Scoping (Draft SR) & Environmental Impact Assessment Report (Draft EIA & EMPr).

Public Participation Plan for the application was as follows:

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

Newspaper advertisement

An advertisement was placed in English in the local newspaper (**Gemsbok**) 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. (see **Appendix 6**)

Site notices

Site notices will be placed (as anticipated on the coordinates below) on 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**. Below are the coordinates where the site notices will be placed.

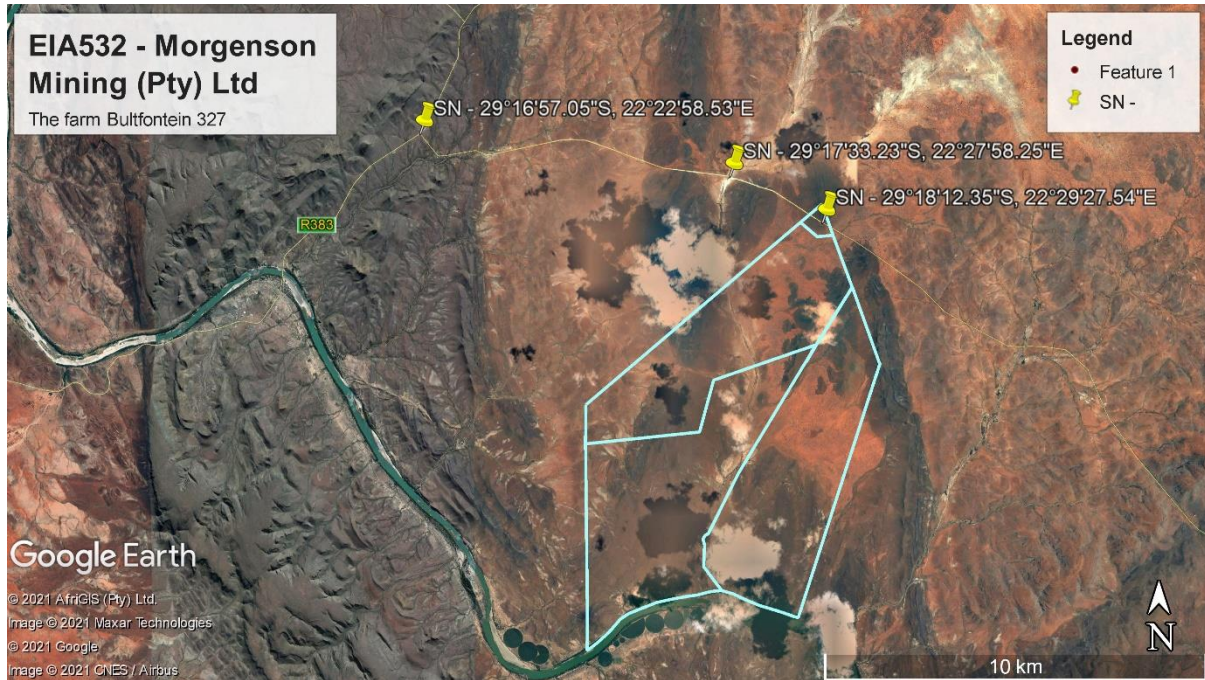


Figure 3: Site notice co-ordinates

Direct notification and circulation of Scoping Report to identified I&APs (stakeholder, landowners, 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 **05 August 2021** and were requested to submit comments by **05 September 2021 (30days)**. A copy of the report is also available at the Milnex offices in Schweizer-Reneke, 4 Botha Street, Schweizer-Reneke and Potchefstroom (Waterberry Street, Waterberry Square, 1st floor, Office 5B, Potchefstroom), between 7:30AM and 5PM, Monday to Friday. For a complete list of stakeholder details and for proof of registered post see **Appendix 6**. The consultees included:

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

Stakeholders
Department of Environmental Affairs and Nature Conservation (DENC)
Department of Human Settlements, Water & Sanitation (DHSWS)
Department of Cooperative Governance, Human Settlements and Traditional Affairs (DCGHSTA)
Department of Mineral Resources and Energy, Northern Cape (DMRE)
Department of Agriculture, Forestry and Fisheries (DAFF)
Department of Roads and Public Works (DRPW)
Ngwao-Boswa Jwa Kapa Bokone (NBKB) - Provincial Heritage Resources Authority of the Northern Cape Province
Northern Cape Department of Agriculture, Land Reform & Rural Development (DALRRD)
WESSA
Siyathemba Local Municipality: Municipal Manager
Siyathemba Local Municipality: Ward 3 Councillor
Pixley Ka Seme District Municipality: Municipal Manager
Landowner
Reben Trust
Anna Engela Bekker
Great Force Investments 3 (Pty) Ltd
D J Cloete & Fourie (Pty) Ltd
Surrounding landowners
DJ Cloete & Fourie (Pty) Ltd
Great Force Investments 3 Pty Ltd
Roodemans Kloof Trust
Martha Catharina Jacobs

Theunis Gert Jacobus Jacobs
Koegas Communal Prop Association
Groendal Boerdery (Pty) Ltd

Direct notification and circulation of EIR & EMPr to identified I&APs (stakeholder, landowners, surrounding landowners, occupiers & I&APs)

Identified I&APs, including key stakeholders representing various sectors, are directly informed of the proposed development and the availability of the EIR & EMPr via registered post on **26 November 2021** and were requested to submit comments by **16 January 2022 (30 days)**. The Public Participation timeframes and commenting period excludes the period of 15 December to 05 January.

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**.

Table 2: List of Stakeholders, Landowners, & surrounding landowners

Stakeholders
Department of Agriculture, Environmental Affairs, Rural Development (DAEARD)
Department of Economic Development and Tourism (DEDAT)
Department of Co-operative Governance, Human Settlements and Traditional Affairs (COGHSTA)
Department of Transport, Safety and Liaison (DTSL)
Department of Social Development (DSD)
Northern Cape Tourism Authority
Northern Cape Heritage Resources Authority (NCHRA)
Department of Mineral Resources and Energy (DMRE)
Department of Water and Sanitation (DWS)
WESSA
Siyathemba Local Municipality: Municipal Manager
Siyathemba Local Municipality: Ward 3 Councillor
Pixley Ka Seme District Municipality: Municipal Manager
Landowner
Reben Trust Anna Engela Bekker
Great Force Investments 3 (Pty) Ltd
D J Cloete & Fourie (Pty) Ltd
Surrounding landowners
DJ Cloete & Fourie (Pty) Ltd
Great Force Investments 3 Pty Ltd
Roodemans Kloof Trust Martha Catharina Jacobs Theunis Gert Jacobus Jacobs
Koegas Communal Prop Association
Groendal Boerdery (Pty) Ltd

Public meeting

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

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

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.

iii) Summary of Issues Raised by I&APs

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

Interested and Affected Parties		Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issue and or response where incorporated
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.				
Organisation	Contact person			
Landowner				
	[REDACTED]			
Bultfontein RE/327	[REDACTED]			
	[REDACTED]			
Bultfontein 1/327 & 2/327	[REDACTED]			
Bultfontein 3/327	[REDACTED]			
Surrounding Landowners				
Hakschin RE/326 & Jan Plaats RE/328	[REDACTED]			
Jan Plaats 1/328 Blaauwboschfontein 1/330 Folmink 2/331	[REDACTED]			
Swaart Pan RE/329	[REDACTED]			
Hounslow RE/323	[REDACTED]			
Hakschin 1/326	[REDACTED]			

Middelwater 2/18	[REDACTED]			
The Municipality in which jurisdiction the development is located				
Siyathemba Local Municipality	[REDACTED]			
Municipal councilor of the ward in which the site is located				
Siyathemba Local Municipality	[REDACTED]			
Organs of state having jurisdiction				
Department of Agriculture, Environmental Affairs, Rural Development (DAEARD)	[REDACTED]			
Department of Economic Development and Tourism (DEDAT)	[REDACTED]			
Department of Co-operative Governance, Human Settlements and Traditional Affairs (COGHSTA)	[REDACTED]			
Department of Roads and Public Works (DR&PW)	[REDACTED]			
Department of Transport, Safety and Liaison (DTSL)	[REDACTED]			
Department of Social Development (DSD)	[REDACTED]			
Northern Cape Tourism Authority	[REDACTED]			
Northern Cape Heritage Resources Authority (NCHRA)	[REDACTED]			
Department of Mineral Resources and Energy (DMRE)	[REDACTED]			
	[REDACTED]			

Department of Water and Sanitation (DWS)				
Commission on Restitution of Land Rights.				
Other–				
Pixley Ka Seme District Municipality				
WESSA				
South African Heritage Resources Agency (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.

DEA Screening Report

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

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

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	14/12/16/3/3/2/729	Solar CSP	Approved	15.6

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

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

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
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) Type of environment affected by the proposed activity.

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

Geology and Soils

Griqualand Sequence

- Ghaap Group (Vn – shale, sandstone, jaspilite with dolomite, chert, etc.)

Classification

The structural basins in which the Transvaal and Griqualand West Sequence occur either side of the complex Vryburg arch. The lower parts of the thick successions are represented by the predominately dolomitic sediments and associated iron formations of the Ghaap group.

The geology of the area is partly attributed to high stream velocities and rapid deposition. Clasts of Ventersdorp lava predominate, with significant (if variable) amounts of banded iron formation (BIF), chert, quartzite and quartz also present.

Ecological habitat and landscape features

The Ecological and Wetland Impact Assessment Report confirmed the vegetation below (**Appendix 12**):

Northern Upper Karoo (NKu3)
Lower Gariep Broken Veld (NKb1)

The result obtained by plotting the coordinates are as follow:

The proposed area falls within vegetation units NKb 1 and NKu 3, which is known as the Lower Gariep Broken Veld and Northern Upper Karoo.

The Lower Gariep Broken Veld is part of the Bushmanland & West Griqualand bioregion and Northern Upper Karoo is part of the Upper Karoo Bioregion. Both are a sub-bioregion for the Nama-Karoo Biome.

Lower Gariep Broken Veld

According to Mucina and Rutherford (2006:333) this vegetation type is distributed in the Northern Cape province. Hardeveld along the Orange River from Onseepkans in the west, including the canyon below the Augrabies Falls and parts of the Riemvasmaak and adjacent areas to Keimoes resuming from the Boegoeberg to around Prieska in the east. A series of inselbergs and koppies occurring between Keimoes and around Kakamas, and the ridge running west of Groblershoop from Karos in the north to around Marydale in the south. The unit also occur in neighbouring Namibia. Its altitude varies from 400m – 1200m.

The vegetation and landscape can be described as hills and low mountains, slightly irregular plains but with some rugged terrain (e.g. downstream of the Augrabies Falls) with sparse vegetation dominated by shrubs and dwarf shrubs, with annuals conspicuous, especially in spring and perennial grasses and herbs. Groups of highly scattered low trees such as *Aloe dichotoma* var. *dichotoma* and *Acacia mellifera* subsp. *detinens* occur on slopes of koppies and on sandy soils of foot slopes respectively.

Some other important Taxa found on in the area:

Only Western and Eastern regions of the unit

Succulent Trees: *Aloe dichotoma* var. *dichotoma*.

Small Trees: *Acacia mellifera* subsp. *detinens* (d), *Commiphora gracilifrons*, *Ficus cordata*, *Peppea capensis*, *Rhus populifolia* *Ziziphus mucronata* subsp. *mucronata*.

Tall Shrubs: *Rhigozum trichotomum* (d), *Adenolobus garipensis*, *Antherothamnus pearsonii*, *Cadaba aphylla*, *Caesalpinia bracteata*, *Ehretia rigida* subsp. *rigida*, *Nymanina capensis*, *Rhigozum obovatum*, *Rhus burchelli*. Epiphytic *Semiparasitic*.

Shrub: *Tapinanthus oleifolius*.

Succulent Shrubs: *Ceraria namaquensis*, *Cryptolepis decidua*, *Euphorbia avasmontana*, *E. gregaria*, *Kleinia longiflora*, *Lycium bosciifolium*, *Zygophyllum dregeanum*.

Woody Succulent Climber: *Sarcostemma viminale*.

Low Shrubs: *Blepharis mitrata* (d), *Aizoon schellenbergii*, *Aptosimum albomarginatum*, *A. lineara*, *A. marlothii*, *Barleria rigida*, *Berkheya spinosissima* subsp. *namaensis*, *Dyerophytum africanum*, *Hermannia spinose*, *H. vestita*, *Hibiscus elliotiae*, *Indigofera heterotricha*, *Limeum aethiopicum*, *Lophiocarpus polystachyus*, *Monechma spartioides*, *Phaeoptilu spinosum*, *Phyllanthus maderaspatensis*, *Polygala seminuda*, *Ptychlobium biflorum* subsp. *biflorum*, *Sericocoma avolans*, *Solanum capense*, *Stachys burchelliana*, *Talinum arnotii*, *Tetragonia arbuscular*, *Zygophyllum rigidum*.

Semiparasitic Shrub: *Thesium lineatum*.

Graminoids: *Aristida adscensionis* (d), *Enneapogon desvauxii* (d), *E. scaber* (d), *Eragrostis nindensis* (d), *Stipagrostis obtuse* (d), *S. uniplumis* (d), *Aristida congesta*, *A. engleri*, *Cenchrus ciliaris*, *Digitaria eriantha*, *Enneapogon cenchroides*, *Eragrostis annulata*, *E. lehmanniana*, *E. porosa*, *Schmidtia kalahariensis*, *Setaria verticillata*, *Sporobolus fimbriatus*, *Stipagrostis anomala*, *S. ciliate*, *Tragus berteronianus*, *Triraphis ramosissima*.

Herbs: *Forsskaolea candida* (d), *Acanthopsis hoffmannseggiana*, *Barleria lichtensteiniana*, *Chamaesyce glanduligera*, *Chascanum garipense*, *Cleome angustifolia* subsp. *diandra*, *Codon royerii*, *Dicoma capensis*, *Garuleum schinzii*, *Rogeria longiflora*, *Sesamum capense*, *Tribulus zeyheri*, *Trichodesma africanum*.

Succulent Herbs: *Orbea lutea* subsp. *lutea*, *Stapelia flavopurpurea*.

Mucina and Rutherford (2006:334) states that the conservation of the Lower Gariep Broken Veld is least threatened with a target of 21%. Only 4% is statutorily conserved in the Augrabies Falls National Park and only a very small part is transformed. The erosion is very low at 27%, low at 58% and moderate at 14%.

Northern Upper Karoo

According to Mucina and Rutherford (2006:340), the Northern Upper Karoo vegetation covers the Northern Cape and Free State Provinces which include the Northern regions of the Upper Karoo plateau from Prieska, Vosburg and Carnarvon in the west to Philipstown, Petrusville and Petrusburg in the east. Bordered in the north by Niekerkshoop, Douglas and Petrusburg and in the south by Carnarvon, Pampoenpoort and De Aar. A few Patches occur in Griqualand West. It is situated on an altitude of 1000m – 1500m.

The shrubland area is dominated by dwarf karoo shrubs, grasses and *Anacia mellifera* subsp. *detinens* and some other low trees (especially on sandy soils in the northern parts and vicinity of the Orange River). Flat to gently sloping, with isolated hills of Upper Karoo Hardeveld in the south and Vaalbos Rocky Shrubland in the northeast and with many interspersed pans.

Some other important Taxa found on in the area:

Small Trees: *Acacia mellifera* subsp. *detinens*, *Boscia albitrunca*.

Tall Shrubs: *Lycium cinereum* (d) *L. horridum*, *L. oxycarpum*, *L. schizocalyx*, *Rhigozum trichotomum*.

Low Shrubs: *Chrysocoma ciliata* (d), *Gnidia polycephala* (d), *Pentzia calcarea* (d), *P. globose* (d), *P. incana* (d), *P. spinescens* (d), *Rosenia humilis* (d), *Amphiglossa triflora*, *Aptosimum marlothii*, *A. spinescens*, *Asparagus glauca*, *Barleria rigida*, *Berkheya annectens*, *Eriocephalus ericoides* subsp. *ericoides*, *E. gladulosus*, *E. spinescens*, *Euryops asparagoides*, *Felicia muricata*, *Helichrysum lucilioides*, *Hermannia spinose*, *Leucas capensis*, *Limeum aethiopicum*, *Melolobium candicans*, *Microloma armatum*, *Osteospermum leptolobum*, *O. spinescens*, *Pegolettia retrofracta*, *Pentzia lanata*, *Phyllanthus maderaspatensis*, *Plinthus karoicus*, *Pteronia glauca*, *P. sordida*, *Selago geniculate*, *S. saxatilis*, *Tetragonia arbuscular*, *Zygophyllum lichtensteinianum*.

Herbs: *Chamaesyce inaequilatera*, *Convolvulus sagittatus*, *Dicoma capensis*, *Gazania krebsiana*, *Hermannia comosa*, *Indigofera alternans*, *Lessertia pauciflora*, *Radyera urens*, *Sesamum capense*, *Sutera pinnatifida*, *Tribulus terrestris*, *Vahlia capensis*.

Graminoids: *Aristida adscensois* (d), *A. congesta* (d), *A. diffusa* (d), *Enneapogon desvauxii* (d), *Eragrostis lehmanniana* (d), *E. obtusa* (d), *E. truncata* (d), *Sporobolus fimbriatus* (d), *Stipagrostis obtuse* (d), *Eragrostis bicolor*, *E. porosa*, *Fingerhuthia Africana*, *Heteropogon contortus*, *Stipagrostis ciliata*, *Themeda triandra*, *Tragus berteronianus*, *T. koelerioides*, *T. racemosus*.

Succulent Shrubs: *Hertia pallens*, *Salsola calluna*, *S. glabrescens*, *S. rabieana*, *S. tuberculata*, *Zygophyllum flexuosum*.

Semiparasitic Shrubs: *Thesium hystrix* (d)

Succulent Herb: *Psilocaulon coriarium*.

Geophytic Herb: *Moraea pallida*.

Mucina and Rutherford (2006:340) also states that the conservation of the Northern Upper Karoo, is Least Threatened with a target of 21%. About 4% has been cleared for cultivation (the highest proportion of any type in the Nama-Karoo) or irreversibly transformed by building of dams (Houwater, Kalkfontein and Smart Syndicate Dams). Areas of human settlements are increasing in the north-eastern part of this vegetation types. Erosion is moderate at 46.2%, very low at 32% and low at 20%. According to Hoffman *et al.* (1999) as stated by Mucina and Rutherford (2006:340) *Prosopis* occurs in generally isolated patches, with densities ranging from very scattered to medium (associated with the lower Vaal River drainage system and the confluences with the Orange River) to localised closed woodland on the western borders of the unit with Bushmanland Basin Shrubland.

According to the Ecological and Wetland Impact Assessment Report the following Plant species observed on site

Table 8: Dominant plant species observed on the study site.

Plant species list		
Scientific Name	Common Name	Status
<i>Acacia karoo</i>	Sweet thorn tree	Least concern
* <i>Agave americana</i>	American Agave	Exotic
* <i>Aloe dichotoma</i>	Quiver tree	Vulnerable A3ce protected
* <i>Aloe claviflora</i>	Kraal aloe	Least concern
<i>Aristida congesta</i>	Spreading Three-awn	Least concern
<i>Asparagus burchellii</i>	Wild asparagus	Least concern, endemic
<i>Asparagus suaveolens</i>	Wild asparagus	Least concern
* <i>Boscia albitrunca</i>	Sheperd's tree	Protected tree
* <i>Bidens pilosa</i>	Blackjack	Exotic
<i>Cenchrus ciliaris</i>	Foxtail Buffalo grass	Least concern
<i>Cynodon dactylon</i>	Couch Grass	Least concern
* <i>Datura stramonium</i>	Downy Thorn Apple	Exotic, declared invader (1b)
<i>Eragrostis annulata</i>	Blousoetgras	Least concern
<i>Eragrostis lehmanniana</i>	Lehmann Lovegrass	Least concern
* <i>Eucalyptus camaldulensis</i>	River red gum tree	Exotic, declared invader (1b)
<i>Fingerhuthia Africana</i>	Thimble grass	Least concern
<i>Heteropogon contortus</i>	Spear grass	Least concern
<i>Lycium arenicola</i>	Sand Honey-thorn	Least concern
<i>Lycium hirsutum</i>	River Honey-thorn	Least concern
<i>Diospyros lycioides</i>	Bushveld Bluebush	Least concern
* <i>Opuntia ficus-indica</i>	Sweet prickly pear	Exotic, declared invader (1b)
<i>Panicum coloratum</i>	Small buffalo grass	Least concern
<i>Pogonarthria squarrosa</i>	Herringbone grass	Least concern
* <i>Ptychlobium biflorum</i>	-	Exotic
<i>Rhigozum trichotomum</i>	Three thorn	Least concern
<i>Searsia lancea</i>	Karree	Least concern
<i>Senegalia mellifera</i>	Black thorn	Least concern
<i>Setaria verticillata</i>	Hooked bristlegrass	Least concern
<i>Stipagrostis obtuse</i>	Small bushman grass	Least concern
* <i>Vachellia erioloba</i>	Camel Thorn	Protected tree
<i>Ziziphus mucronata</i>	Buffalo-thorn	Least concern
<i>Ziziphus zeyheriana</i>	Dwarf Buffalo-thorn	Least concern

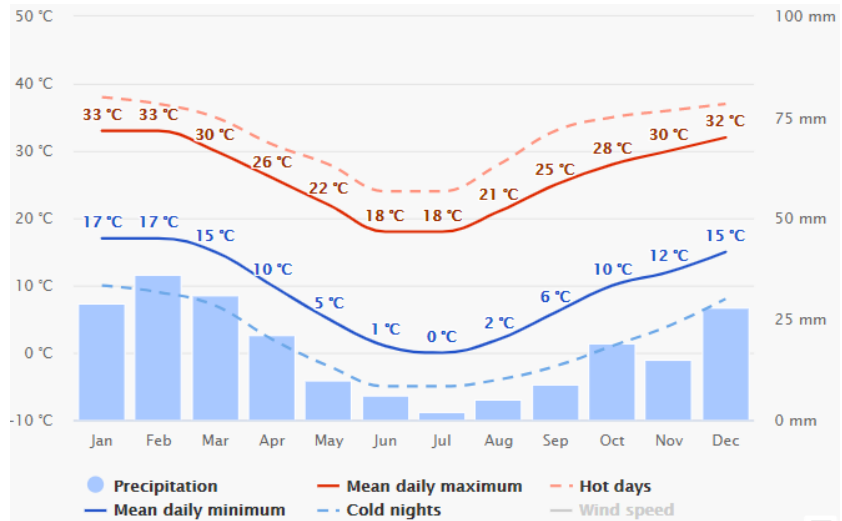
Climate

Niekerkshoop 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.

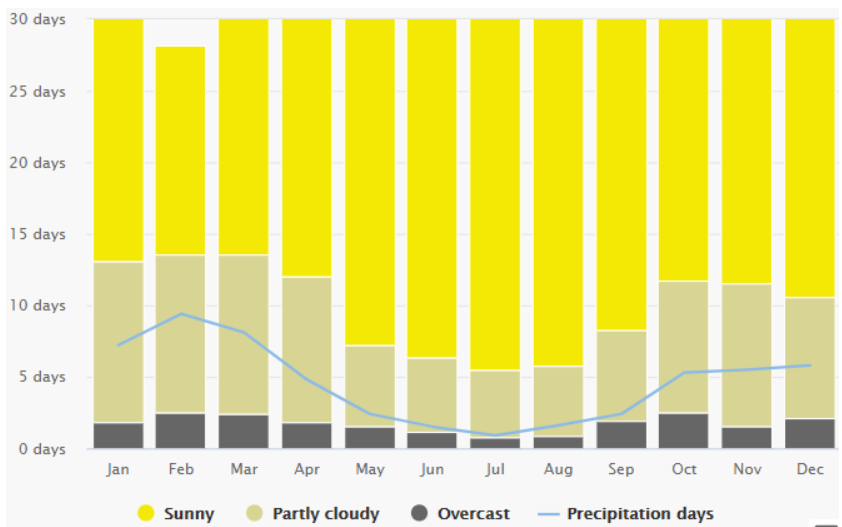
Average temperatures and precipitation

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Niekerkshoop. 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. Monthly precipitations above 150mm are mostly wet, below 30mm mostly dry.



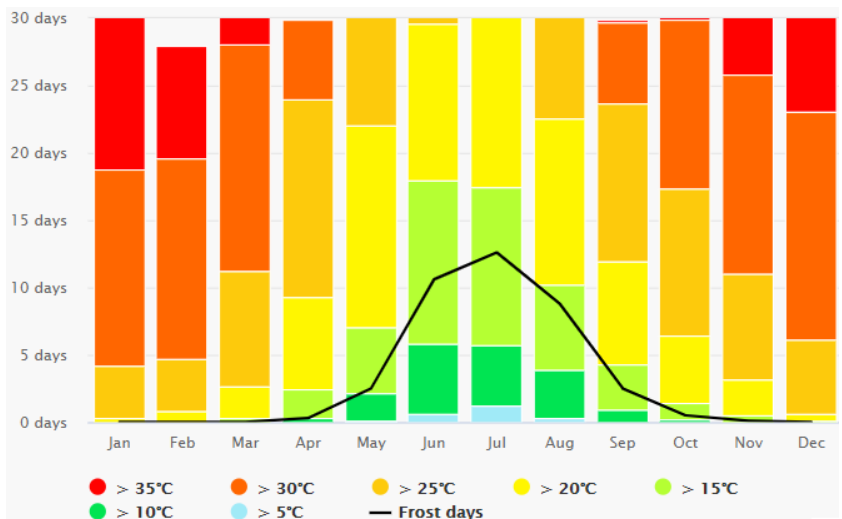
Cloudy, sunny, and precipitation days

The graph shows the monthly number of sunny, partly cloudy, overcast and precipitation days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.



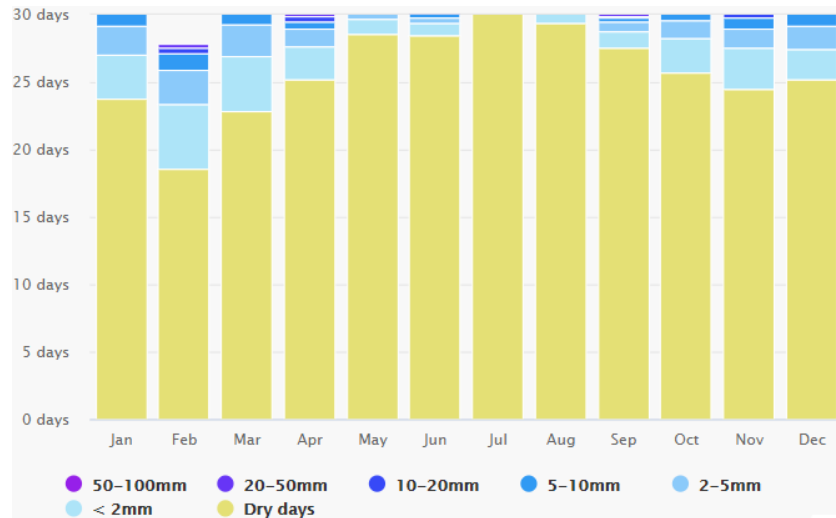
Maximum temperatures

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



Precipitation amounts

The precipitation diagram for Niekerkshoop shows on how many days per month, certain precipitation amounts are reached. In tropical and monsoon climates, the amounts may be underestimated.



Agricultural / land capability

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

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

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

The proposed area falls within Land in Class VII (7) and VIII (8). (refer to Land capability map on **figure 6** and attached as **Appendix 5**).

(EN), Vulnerable (VU) and Protected.

The proposed site does not fall within a threatened ecosystem according to **Figure 8**.

Protected Areas

According to the data for protected areas (**Figure 8**), the proposed area does not fall within a formally protected area.

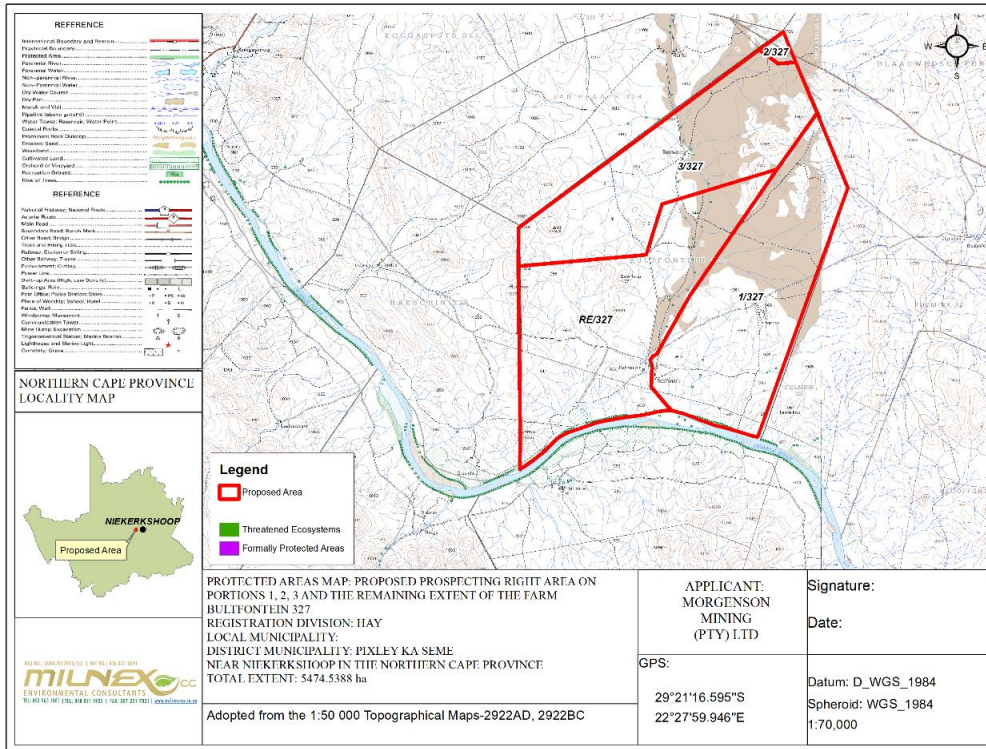


Figure 8: Threatened and Protected Areas Map

The Ecological and Wetland Impact Assessment Report confirmed the above mentioned (**Appendix 12**):

- According to the National Threatened Ecosystem database (2011), no threatened ecosystems overlaps with the study site.

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 areas fall within CBA 1, ESA and ONA.

According to the DEA Screening Tool the proposed area falls within high and low Terrestrial Biodiversity theme sensitivity. Please see **Appendix 7** for the colour map.

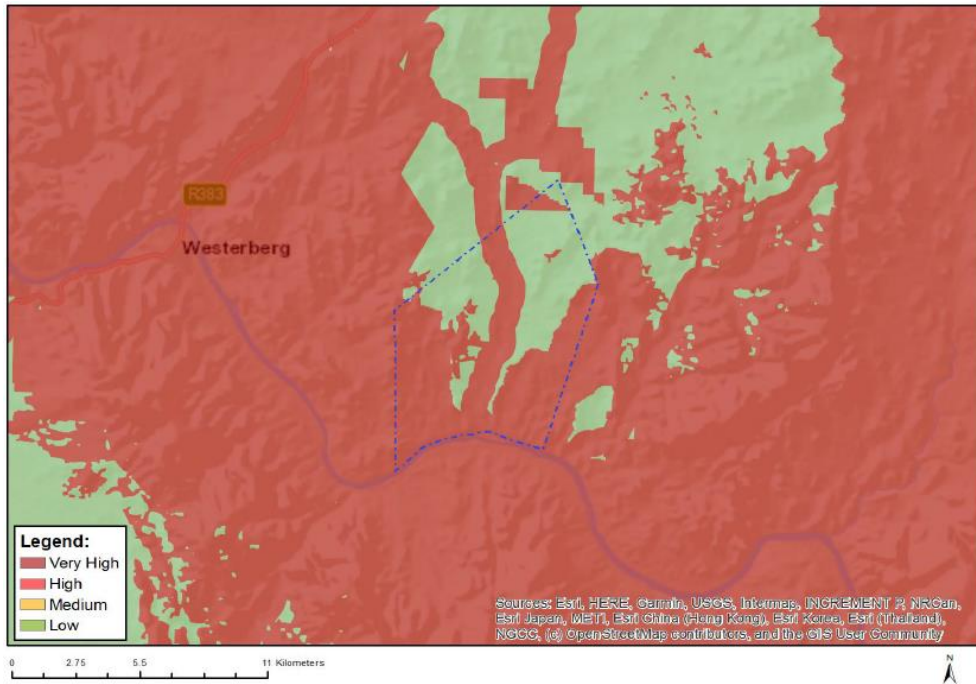


Figure 11: Terrestrial Biodiversity Combined Sensitivity

According to the DEA Screening Tool the proposed portions mostly fall within medium Animal Species theme sensitivity and a very small area within high and low sensitivity. Please see **Appendix 7** for the colour map.

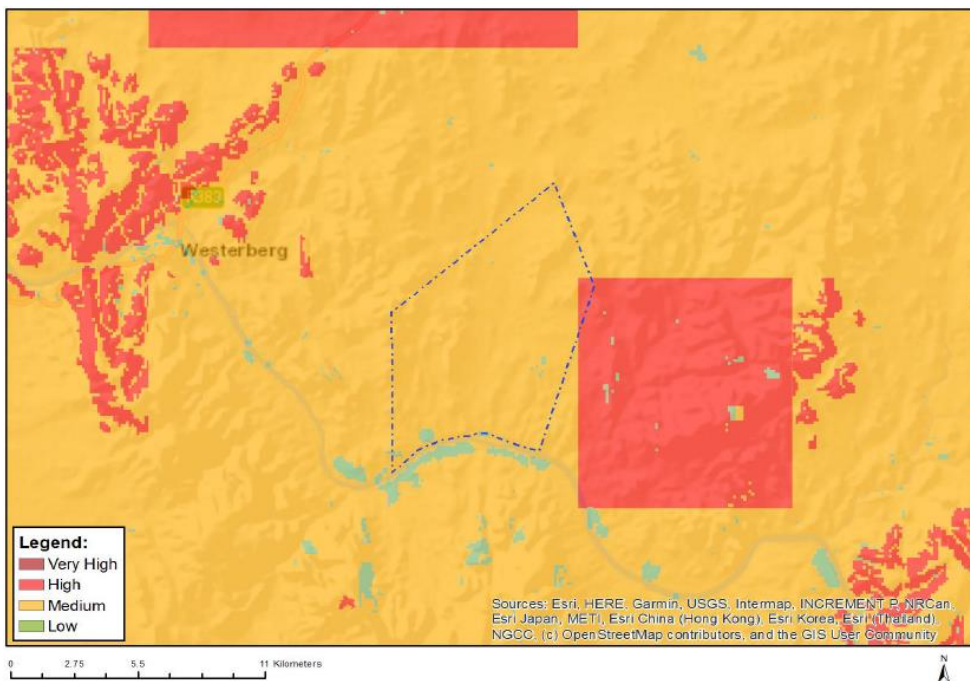


Figure 12: Animal Species theme sensitivity.

According to the Ecological and Wetland Impact Assessment Report (**Appendix 12**) the Herpetofauna and mammals expected on the proposed area is as follows:

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

(See species in bold). It was noted that most of the big game observed on site were brought in by the landowners for game farming and hunting purposes. Therefore, not all observed mammals are likely to naturally occur in the area.

Highlighted Species were observed on site.

Table 10: List of Mammals Possibly Occurring on Site (ADU, 2019)

Family	Scientific Name	Common Name	Red List Category	ToPS
Bovidae	<i>Aepyceros melampus</i>	Impala	Least Concern	
Bovidae	<i>Alcelaphus buselaphus caama</i>	Red Hartebeest	Least Concern (2008)	
Bovidae	<i>Damaliscus pygargus phillipsi</i>	Blesbok	Least Concern (2016)	
Bovidae	<i>Connochaetes gnou</i>	Black Wildebeest	Least Concern (ver 3.1, 2016)	
Bovidae	<i>Connochaetes taurinus</i>	Blue Wildebeest	Least Concern (ver 3.1, 2016)	
Bovidae	<i>Kobus ellipsiprymnus</i>	Waterbuck	Least Concern (ver 3.1, 2016)	
Bovidae	<i>Taurotragus oryx</i>	Common Eland	Least Concern (ver 3.1, 2016)	
Bovidae	<i>Antidorcas marsupialis</i>	Springbuck	Least Concern (ver 3.1, 2016)	
Bovidae	<i>Raphicerus campestris</i>	Steenbok	Least Concern (2016)	
Bovidae	<i>Sylvicapra grimmia</i>	Bush Duiker	Least Concern (2016)	
Bovidae	<i>Hippotragus niger niger</i>	Sable	Least Concern (ver 3.1, 2016)	
Bovidae	<i>Hippotragus equinus</i>	Roan	Least Concern (ver 3.1, 2016)	
Bovidae	<i>Tragelaphus scriptus</i>	Bushbuck	Least Concern	
Bovidae	<i>Tragelaphus angasii</i>	Nyala	Least Concern (ver 3.1, 2016)	
Bovidae	<i>Oryx gazella</i>	Gemsbok	Least Concern (ver 3.1, 2016)	
Bovidae	<i>Syncerus caffer</i>	Cape Buffalo	Least Concern (Population decreasing)	
Bovidae	<i>Tragelaphus strepsiceros</i>	Greater Kudu	Least Concern (2016)	
Canidae	<i>Canis mesomelas</i>	Black-backed Jackal	Least Concern (2016)	
Canidae	<i>Otocyon megalotis</i>	Bat-eared Fox	Least Concern (2016)	
Hyaenidae	<i>Crocuta crocuta</i>	Spotted Hyena	Least Concern (ver 3.1, 2016)	
Canidae	<i>Vulpes chama</i>	Cape Fox	Least Concern (2016)	Protected
Cercopithecidae	<i>Chlorocebus pygerythrus</i>	Vervet Monkey	Least Concern (2016)	
Erinaceidae	<i>Atelerix frontalis</i>	Southern African Hedgehog	Near Threatened (2016)	Protected
Felidae	<i>Caracal caracal</i>	Caracal	Least Concern (2016)	
Felidae	<i>Felis nigripes</i>	Black-footed Cat	Vulnerable (2016)	Protected
Felidae	<i>Felis silvestris</i>	Wildcat	Least Concern (2016)	
Felidae	<i>Leptailurus serval</i>	Serval	Near Threatened (2016)	Protected
Felidae	<i>Panthera pardus</i>	Leopard	Vulnerable (2016)	Protected
Giraffidae	<i>Giraffa giraffa giraffa</i>	South African Giraffe	Least Concern (2016)	
Herpestidae	<i>Cynictis penicillata</i>	Yellow Mongoose	Least Concern (2016)	
Herpestidae	<i>Herpestes sanguineus</i>	Slender Mongoose	Least Concern (2016)	

<i>Herpestidae</i>	<i>Suricata suricatta</i>	<i>Meerkat</i>	<i>Least Concern (2016)</i>	
<i>Herpestidae</i>	<i>Mungos mungo</i>	<i>Banded Mongoose</i>	<i>Least Concern (2016)</i>	
<i>Hyaenidae</i>	<i>Hyaena brunnea</i>	<i>Brown Hyena</i>	<i>Near Threatened (2015)</i>	<i>Protected</i>
<i>Hyaenidae</i>	<i>Proteles cristata</i>	<i>Aardwolf</i>	<i>Least Concern (2016)</i>	
<i>Leporidae</i>	<i>Lepus capensis</i>	<i>Cape Hare</i>	<i>Least Concern</i>	
<i>Leporidae</i>	<i>Lepus saxatilis</i>	<i>Scrub Hare</i>	<i>Least Concern</i>	
<i>Procaviidae</i>	<i>Procavia capensis</i>	<i>Rock Hyrax</i>	<i>Least Concern (2016)</i>	
<i>Mustelidae</i>	<i>Ictonyx striatus</i>	<i>Striped Polecat</i>	<i>Least Concern (2016)</i>	
<i>Mustelidae</i>	<i>Mellivora capensis</i>	<i>Honey Badger</i>	<i>Least Concern (2016)</i>	<i>Protected</i>
<i>Mustelidae</i>	<i>Poecilogale albinucha</i>	<i>African Striped Weasel</i>	<i>Near Threatened (2016)</i>	
<i>Mustelidae</i>	<i>Aonyx capensis</i>	<i>African clawless otter</i>	<i>Near Threatened (2016)</i>	
<i>Orycteropodidae</i>	<i>Orycteropus afer</i>	<i>Aardvark</i>	<i>Least Concern (2016)</i>	
<i>Pedetidae</i>	<i>Pedetes capensis</i>	<i>South African Spring Hare</i>	<i>Least Concern (2016)</i>	
<i>Sciuridae</i>	<i>Xerus inauris</i>	<i>South African Ground Squirrel</i>	<i>Least Concern</i>	
<i>Suidae</i>	<i>Phacochoerus africanus</i>	<i>Common Warthog</i>	<i>Least Concern (2016)</i>	
<i>Hysticidae</i>	<i>Hystrix africaeaustralis</i>	<i>Cape Porcupine</i>	<i>Least Concern (2016)</i>	
<i>Viverridae</i>	<i>Civettictis civetta</i>	<i>African Civet</i>	<i>Least Concern (2016)</i>	
<i>Viverridae</i>	<i>Genetta genetta</i>	<i>Common Genet</i>	<i>Least Concern (2016)</i>	

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. No protected reptile species are known to occur, nor were observed on site. Only the Endangered (IUCN, 2021) African Spurred tortoise (*Centrochelys sulcata*), Cape cobra (*Naja niveawas*) and Rock monitor (*Varanus albigularis*) was observed on site. Based on the Frog Atlas of South Africa, the Near Threatened Giant Bullfrog (*Pyxicephalus adspersus*) and Tremelo Sand Frog (*Tomopterna cryptotis*) are expected to occur on site.

Biodiversity Priority Areas for Mining

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

Table 2: Four categories of biodiversity priority areas in relation to their biodiversity importance and implications for mining.

Category	Biodiversity Priority Areas	Risks for Mining	Implications for Mining
A. Legally Protected	<ul style="list-style-type: none"> Protected areas (including National Parks, Nature Reserves, World Heritage Sites, Protected Environments, Nature Reserves) Areas declared under Section 49 of the Mineral and 	Mining Prohibited	<p>Mining projects cannot commence as mining is legally prohibited. Although mining is prohibited in Protected Areas, it may be allowed in Protected Environments if both the Minister of Mineral Resources and Minister of Environmental Affairs approve it.</p> <p>In cases where mining activities were conducted lawfully in protected areas before Section 48 of the Protected Areas Act (No. 57 of 2003) came into effect, the Minister</p>

	Petroleum Resources Development Act (No. 28 of 2002)		of Environmental Affairs may, after consulting with the Minister of Mineral Resources, allow such mining activities to continue, subject to prescribed conditions that reduce environmental impacts.
B. Highest Biodiversity Importance	<ul style="list-style-type: none"> • Critically endangered and endangered ecosystems • Critical Biodiversity Areas (or equivalent areas) from provincial spatial biodiversity plans • River and wetland Freshwater Ecosystem Priority Areas (FEPAs) and a 1km buffer around these FEPAs • Ramsar Sites 	Highest Risk for Mining	<p>Environmental screening, environmental impact assessment (EIA) and their associated biodiversity specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licences, and environmental authorisations.</p> <p>If they are confirmed, the likelihood of a fatal flaw for new mining projects is very high because of the significance of the biodiversity features in these areas and the associated ecosystem services. These areas are viewed as necessary to ensure protection of biodiversity, environmental sustainability, and human well-being.</p> <p>An EIA should include the strategic assessment of optimum, sustainable land use for an area and will determine the significance of the impact on biodiversity.</p> <p>This assessment should fully consider the environmental sensitivity of the area, the overall environmental and socio-economic costs and benefits of mining, as well as the potential strategic importance of the minerals to the country.</p> <p>Authorisations may well not be granted. If granted, the authorisation may set limits on allowed activities and impacts and may specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p>
C. High Biodiversity Importance	<ul style="list-style-type: none"> • Protected area buffers (including buffers around National Parks, World Heritage Sites* and Nature Reserves) • Transfrontier Conservation Areas (remaining areas outside of formally proclaimed protected areas) • Other identified priorities from provincial spatial biodiversity plans • High water yield areas • Coastal Protection Zone • Estuarine functional zone <p>*Note that the status of buffer areas of World Heritage Sites is subject to a current intra-governmental process</p>	High Risk for Mining	<p>These areas are important for conserving biodiversity, for supporting or buffering other biodiversity priority areas, and for maintaining important ecosystem services for communities or the country.</p> <p>An EIA should include an assessment of optimum, sustainable land use for an area and will determine the significance of the impact on biodiversity.</p> <p>Mining options may be limited in these areas, and limitations for mining projects are possible.</p> <p>Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.</p>
D. Moderate Biodiversity Importance	<ul style="list-style-type: none"> • Ecological support areas • Vulnerable ecosystems • Focus areas for protected area expansion (land-based and offshore protection) 	Moderate Risk for Mining	<p>These areas are of moderate biodiversity value.</p> <p>EIAs and their associated specialist studies should focus on confirming the presence and significance of these biodiversity features, identifying features (e.g. threatened (land-based and offshore protection) species) not included in the existing datasets, and on providing site-specific information to guide the application of the mitigation hierarchy.</p>

Figure 14 illustrates all wetland types associated with the study area. The portions that boarder the Orange river has a Floodplain wetlands and there is also a depression on one of the proposed area. The wetland vegetation types forms part of the Nama Karoo Bushmanland and Upper Nama Karoo (**Figure 15**).

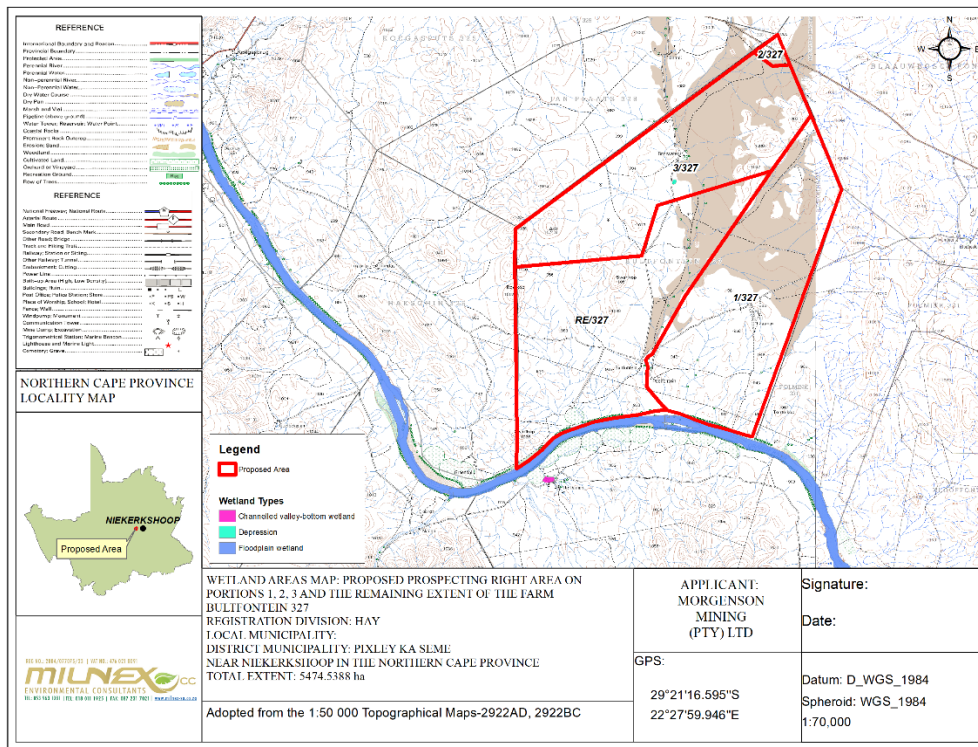


Figure 14: Wetland types located within or near the study site.

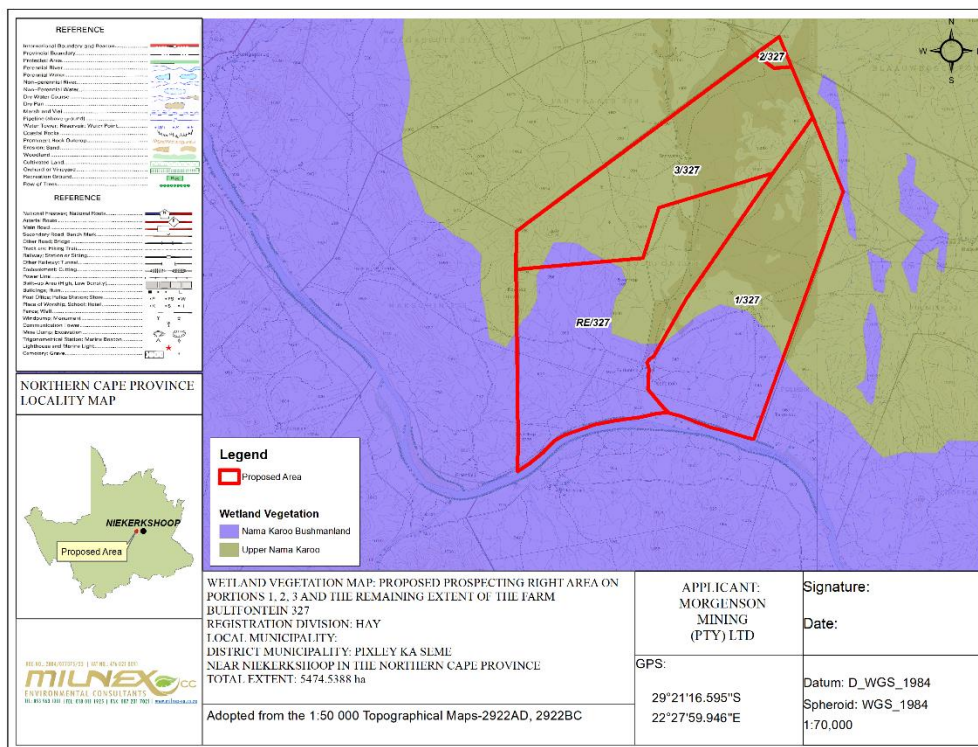


Figure 15: Wetland vegetation type

The Ecological and Wetland Impact Assessment Report confirmed the above mentioned (**Appendix 12**):

From the desktop assessment, one wetland type was expected to occur within the study area (Figure 10). The wetland is observed to be a Floodplain wetland bordering the Southern boundary of the study area. A site visit was conducted to confirm the desktop findings and are discussed below.



Figure 9: Wetlands and Riparian areas assessed on site. A: Drainage line presenting bedrock and riparian vegetation on the left. B: Drainage line presenting alluvial deposits from storm water and riparian vegetation. C and D: Floodplain wetland (Orange river).

One wetland type and second order stream Riparian areas were assessed and delineated during the site visit (Figure 9). The site visit confirmed the assessed wetland to be a Floodplain wetland. The Second order streams (Drainage lines) did not present any wetland indicators but presented Riparian areas which are characteristic of a watercourse. Therefore, the Riparian areas of these drainage lines were assessed.

The Floodplain Wetland is the Orange river flowing along the Southern boundary of the study site (Figure 9C and D). The Riparian areas are located along undefined, ephemeral second order streams / drainage lines traversing across the study area.(Figure 9A and B).

Wetland Delineation

The buffer zones (Figure 13) for wetlands were based on mining operations and were calculated using the Site-Based Tool: Determination of buffer zone requirements for wetland ecosystems (Macfarlane et al., 2010). The recommended/exclusion buffer zones were calculated to be 37m (Floodplain) and 48m (Riparian areas) from the delineated areas

Summary of Results

The results recorded for the watercourse potentially affected by the agricultural activities are summarised in Table 15 below.

Table 1: Summary of the results

Classification	Scientific Buffer	PES	EIS	REC
Floodplain	48m	C	Very High	B Improve
Riparian areas	37m	C	High	B/C Improve

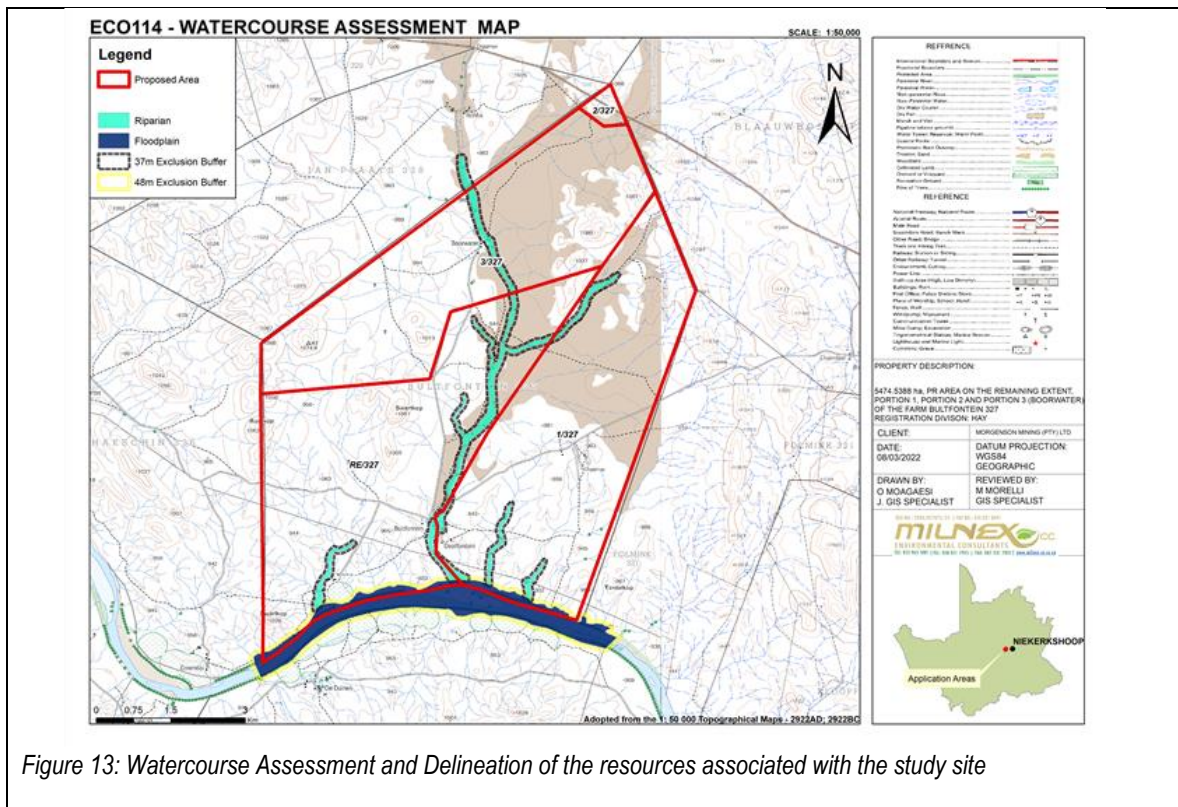


Figure 13: Watercourse Assessment and Delineation of the resources associated with the study site

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 16).

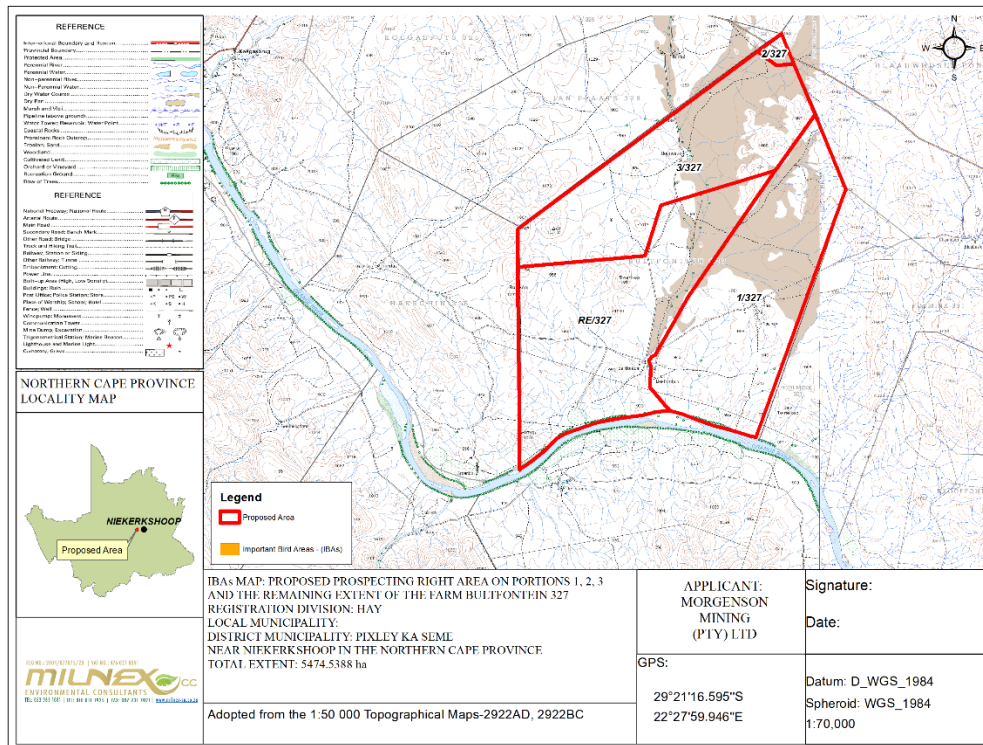


Figure 16: Important Bird and Biodiversity Areas associated with the study site.

According to the Ecological and Wetland Impact Assessment Report the list of birds possibly occurring on site:

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

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

Suitable breeding, nesting and feeding habitats influencing bird distribution and migration were observed on site in the form of Riparian areas. These areas presented vegetation with greater physical structure and density as compared to adjacent terrestrial vegetation. Birds potentially occurring in the study area and enjoy conservation status in the IUCN Red List are presented in **Table 9** below.

Table 2: List of Birds Possibly Occurring on Site (IUCN, 2021)

Scientific Name	Common Name	Red Data List Category	Likely to Occur
<i>Sagittarius serpentarius</i>	Secretarybird	EN	Possibly
<i>Circus maurus</i>	Black Harrier	EN	Possibly
<i>Oxyura maccoa</i>	Maccoa Duck	VU	Possibly
<i>Gyps africanus</i>	White-backed Vulture	CR	Possibly
<i>Torgos tracheliotos</i>	Lappet-faced Vulture	EN	Possibly
<i>Gyps coprotheres</i>	Cape Vulture	EN	Possibly
<i>Polemaetus bellicosus</i>	Martial Eagle	EN	Possibly
<i>Aquila rapax</i>	Tawny Eagle	VU	Possibly
<i>Calidris ferruginea</i>	Curlew Sandpiper	NT	Possibly
<i>Phoeniconaias minor</i>	Lesser Flamingo	NT	Not Likely
<i>Glareola nordmanni</i>	Black-winged pratincole	NT	Possibly
<i>Falco vespertinus</i>	Red-footed Falcon	NT	Possibly
<i>Circus macrourus</i>	Pallid Harrier	NT	Possibly
<i>Numenius arquata</i>	Eurasian Curlew	NT	Not Likely
<i>Ardeotis kori</i>	Kori Bustard	NT	Possibly
<i>Bucorvus leadbeateri</i>	Southern Ground-hornbill	VU	Possibly

River Ecosystem Status

According to **Figure 17**, the status of the Orange river is classed as Largely Modified (Class B).

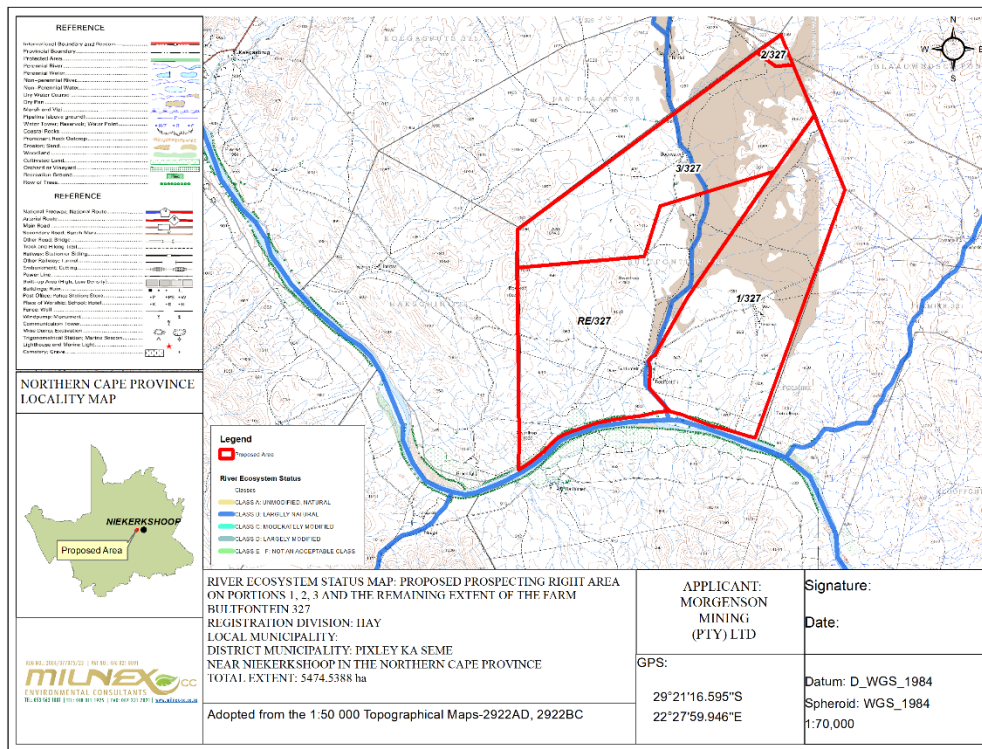


Figure 17: Ecosystem status of the rivers occurring in close proximity to the study site.

Cultural and heritage aspects

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



Figure 18: Archaeological and Cultural Heritage Combined Sensitivity

According to the DEA Screening Report the proposed portions fall mostly within medium sensitivity and a small area within High and Very High sensitivity. Please see map colour map under **Appendix 7**.

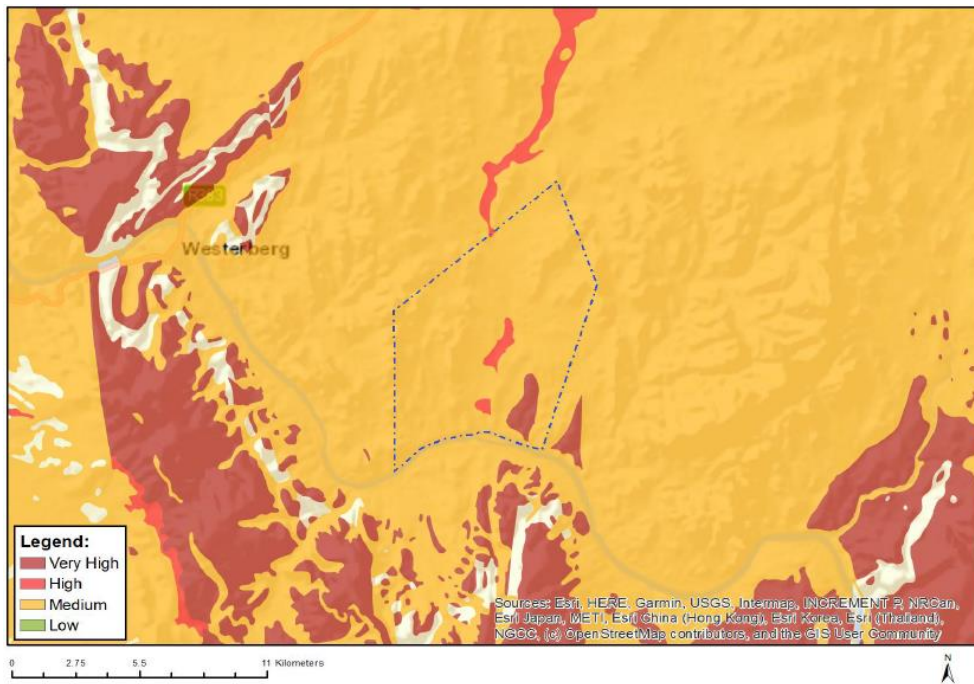


Figure 19: Relative Paleontology Theme Sensitivity

The Phase 1 Cultural Heritage Impact Assessment made the following findings in the table below. Note the photos in the specialist report was not included in the table below, but the report is available under **Appendix 12**.

During the physical survey, the following sites, features and objects of cultural significance were identified in the project area (Fig. 12).

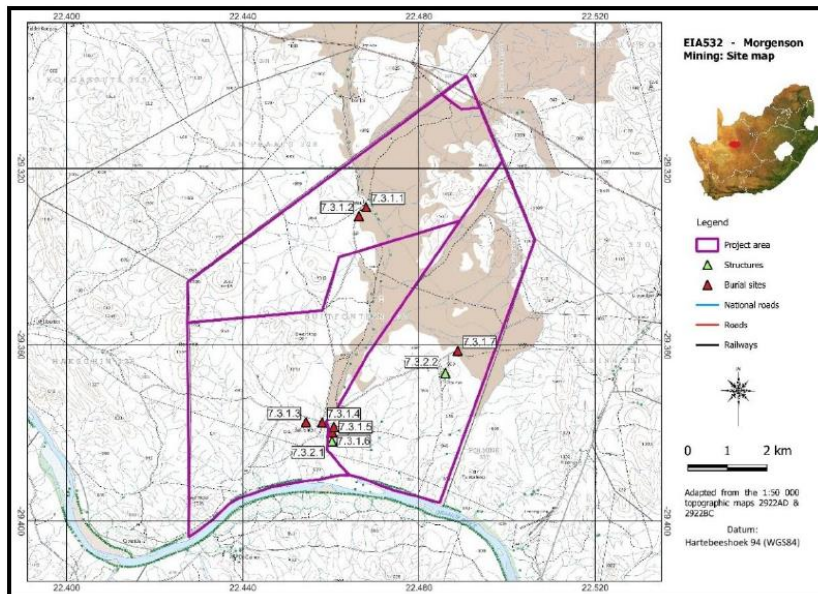


Figure 12. Location of heritage sites in the project area

7.2 Stone Age

NHRA Category		Archaeological resources – Section 35
7.1.1 Type: Stone Age chance finds		
Description: Some poorly formed stone tools, classified as side- and end scrapers, dating to the Middle Stone Age was identified. Its density is very low, probably one in 1000m ² . This absence of Stone Age material has been commented on by researchers that surveyed the same farm or adjacent ones.		
Significance of site/feature	Generally protected 4C: Low significance - Requires no further recording before destruction.	
Reasoned opinion: This material is rated to have low significance due to their low numbers as well as the fact that it is surface material and is not in its primary position anymore.		
References: Kruger (2018); Rossouw (2019); Van Vollenhoven (2018); Van Schalkwyk (2016, 2019, 2020)		
Illustrations		

7.2 Iron Age

- No sites, features or objects of cultural significance dating to the Iron Age were identified in the project area.

NHRA Category		Graves, Cemeteries and Burial Grounds - Section 36		
Number	Name	Farm name	Latitude	Longitude
7.3.1.1	Burial site	Bultfontein 327 (Boorwater)	-29.3287190	22.4680050
7.3.1.2	Burial site	Bultfontein 327 (Boorwater)	-29.3307820	22.4663420
7.3.1.3	Burial site	Bultfontein 327	-29.3775690	22.4543350
7.3.1.4	Burial site	Bultfontein 327	-29.3776300	22.4579960
7.3.1.5	Burial site	Bultfontein 327	-29.3786420	22.4606560
7.3.1.6	Burial site	Bultfontein 327	-29.3798220	22.4602790
7.3.1.7	Burial site	Bultfontein 327	-29.3613500	22.4579960
Description				
7.3.1.1	Informal burial site with 5 graves. Apparently, it is the graves of former landowners. The site is fenced off and is well maintained. It is located in close proximity to the farmstead.			
7.3.1.2	Informal burial site with 2 graves. Apparently, it is the graves of former workers. The site is fenced off and is well maintained. It is located in close proximity to the ESKOM distribution line.			
7.3.1.3	Informal burial site with probably 30 graves. It is difficult to establish the exact size, extent and number of graves in the burial site due to the fact that all are marked only with stone cairns, with some of the stones having been dislodged over time by grazing cattle and uncontrolled vegetation growth. No visits by descendants to the site for cleaning or commemorating could be seen.			
7.3.1.4	A single grave marked with formal headstone indicating that it belongs to a JN Noethe that died in 1951. The site is fenced off and is located in close proximity to the farmstead.			
7.3.1.5	Informal burial site with probably more than 30 graves. It is difficult to establish the exact size, extent and number of graves in the burial site due to the fact that all are marked only with stone cairns, with some of the stones having been dislodged over time by grazing cattle and uncontrolled vegetation growth. No visits by descendants to the site for cleaning or commemorating could be seen. Local oral history has it that these graves were 'investigated' by people associated with a university (also see Gous & Wahl 1989). To what extent this took place is unknown but			
	based on the publication referred to the graves were excavated and documented. It is unknown if the remains were removed. ³			
7.3.1.6	A burial site with probably more than 70 graves. It is difficult to establish the exact size, extent and number of graves in the burial site due to the fact that only a few are marked headstones, whereas the rest are only marked with stone cairns, with some of the stones having been dislodged over time by grazing cattle and uncontrolled vegetation growth. No visits by descendants to the site for cleaning or commemorating could be seen. The site used to be fenced off with a stone wall. It is possible that some of these graves were also investigated at the same time when those indicated in 7.3.1.5 were investigated.			
7.3.1.7	Informal burial site with probably 40 graves. It is difficult to establish the exact size, extent and number of graves in the burial site due to the fact that all are marked only with stone cairns, with some of the stones having been dislodged over time by grazing cattle and uncontrolled vegetation growth. No visits by descendants to the site for cleaning or commemorating could be seen.			
Significance of site/feature	Generally protected 4A: High/medium significance - Should be mitigated before destruction.			
Reasoned opinion: Burial sites are viewed as having high emotional and sentimental value. However, mitigation is possible if proper procedures have been followed.				
References: Gous & Wahl (1989)				

NHRA Category		Structures older than 60 years - Section 34		
Number	Name	Farm name	Latitude	Longitude
7.3.2.1	Farmstead	Bultfontein 327	-29.38192	22.46032
Description				
7.3.2.1	Apparently the original house built by one of the earliest white occupants of the farm. It is abandoned and stripped of all usable fittings. It is built in what is commonly referred to as the Karoo-style. It has a flat, corrugated iron roof and a small veranda in front. A kollomeintjie of open hearth fire-place is in the western side.			
Significance of site/feature		Generally protected 4B: Medium significance - Should be mitigated before destruction.		
Reasoned opinion: Destruction of a limited number of similar features located in the larger landscape.				
References: -				
Illustrations				

Number	Name	Farm name	Latitude	Longitude
7.3.2.2	Asbestos Mine	Bultfontein 327	-29.36609	22.48442
Description				
7.3.2.2	Old mine where asbestos was mined – probably Crocidolite, as it is very distinctive blue in colour and is visible in the spoil heaps at the processing plant. The mine consists of various elements as indicated in the aerial image below. The site was probably abandoned during the early 1960s.			

Significance of site/feature		Generally protected 4B: Medium significance - Should be mitigated before destruction.		
Reasoned opinion: Destruction of a limited number of similar features located in the larger landscape.				
References: Ehlers & Vorster (1998)				
Illustrations				



Layout of the mine (Google Earth)

MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

Sources of risk were considered with regards to development activities defined in Section 2(viii) of the NHRA that may be triggered and are summarised in Table 2A and 2B below. These issues formed the basis of the impact assessment described. The potential risks are discussed according to the various phases of the project below.

Objectives

- 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 National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).

Please see the findings and recommendations of the Palaeontological Desktop Assessment below:

The proposed Diamond Prospecting Right Application near Prieska is underlain by Quaternary deposits, Tertiary calcretes and the Ghaap Group (Transvaal Supergroup, Griqualand West Basin). According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Quaternary sediments is Low, that of the Tertiary Calcrete is High, while the Palaeontological Sensitivity of the Ghaap Group is Moderate (Almond and Pether 2008, SAHRIS website). A Low Palaeontological Significance has been allocated to the proposed Prospecting Right Application. It is therefore considered that the proposed development is believed to be appropriate and will not lead to detrimental impacts on the palaeontological reserves of the area.

If Palaeontological Heritage is uncovered during surface clearing and excavations the Chance find Protocol attached should be implemented immediately

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.

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.*
- *In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.*
- *Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.*

Description of the socio-economic environment

- Socio-economic conditions

Siyathemba Local Municipality

Siyathemba Municipality contributed 11.9% to the District population (i.e. the second largest Local Municipality in the District by population) and 1.9% to the population of the Northern Cape.

The most dominant population group is Coloured⁴. This group represents 80% of the total population in the municipal area. The other groups are black (12%) and white (8%).

Afrikaans is the most widely spoken language (78%). There are an insignificant number of people which speaks other languages. A total of 824 people indicated that IsiNdebele is their first language and 91 people speak Setswana.

Unemployment

There has been a decrease in the number of people employed and a concomitant increase in the number of unemployed in the district between these the 2001 and 2011 censuses. This is directly related to the number of businesses that has closed in the region during the period reflected and indicates the need for a retention or wholesale and retail strategy regarding these businesses. Unemployment reaching approximately 28.3% 2011 and Youth unemployment reaching 35.4% in 2011 as per Stats SA 2011 Census.

Regional Gross Domestic Product

The district contribution to the provincial GDPR has consistently been the lowest over recent years with its contribution declining from 10,6% to 9,6% between 2003 and 2004. The economy is predominantly primary sector focused with manufacturing and tourism also contributing to the district economy.

The economic sectors that contribute the most to the GDPR of Pixley Ka Seme are Agriculture, Mining, Tourism and Manufacturing.

Table 20 below represents the percentage contribution per economic sector by the district to the gross domestic product of the province for 2003 and 2004.

Table 20: % GDPR of district municipalities per economic sector for 2003 and 2004

	% OF GDPR									
	Primary		Secondary		Tertiary		Taxes - Subsidies		Total GDPR	
	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004
Namakwa	4,3	3,8	0,5	0,4	7,3	7,0	0,7	0,8	12,8	12,1
PKSDM	3,1	2,7	1,0	0,9	5,8	5,2	0,8	0,8	10,6	9,6
Siyanda	3,8	3,3	1,3	1,3	8,0	7,7	1,1	1,2	14,2	13,5
Frances Baard	6,8	6,2	3,2	3,1	26,1	28,6	2,5	2,0	38,6	40,7
Kgalagadi	16,7	16,5	1,4	1,3	4,9	5,5	0,7	0,8	23,8	24,1
NC GDPR	34,7	32,6	7,3	7,1	52,1	54,0	5,8	5,6	100,0	100,0

Pixley Ka Seme's total percentage contribution in 2003 was 10,6% and declined to 9,64% in 2004. The district contribution to the GDP has consistently been the lowest over recent years with its contribution declining. It is evident that the tertiary sector contributes the greatest percentage to the GDP of the Northern Cape, followed by the primary sector and then the secondary sector.

The Pixley Ka Seme district displays a similar characteristic as the province with respect to its sectoral contributions to GDP; the economic sectors that contribute the most to the GDP of Pixley Ka Seme are Agriculture, Mining, Tourism and Manufacturing, with its secondary sector contribution being the least. The manufacturing sector is part of the secondary sector which indicates that it has declined over the period of 2003 (0, 97%) and in 2004 (0, 92%).

Pixley Ka Seme’s total percentage contribution in 2003 was 10,6% and declined to 9,64% in 2004. The district contribution to the GDP has consistently been the lowest over recent years with its contribution declining. It is evident that the tertiary sector contributes the greatest percentage to the GDP of the Northern Cape, followed by the primary sector and then the secondary sector.

The Pixley Ka Seme district displays a similar characteristic as the province with respect to its sectoral contributions to GDP; the economic sectors that contribute the most to the GDP of Pixley Ka Seme are Agriculture, Mining, Tourism and Manufacturing, with its secondary sector contribution being the least. The manufacturing sector is part of the secondary sector which indicates that it has declined over the period of 2003 (0, 97%) and in 2004 (0, 92%). To transform and diversify the status of the districts economy will require a concerted effort to improve and create development opportunities within this sector.

Location Quotient

A comparative advantage indicates a relatively more competitive production function for a product or service in specific economy than the aggregate economy. This economy therefore renders this service more efficiently. The location quotient is an indication of the comparative advantage of an economy in terms of its production and employment. A location quotient greater than 1 indicates a comparative advantage regarding the sector in one location with respect to another.

The analysis below indicates the location quotient of the Pixley ka Seme District with respect to the Northern Cape Province. The table and graph below indicates the location quotients of sectors in the district municipality with respect to the Northern Cape.

Sectors in the economy of Pixley Ka Seme that have a location quotient larger than 1 are agriculture (2, 35); community, social and personal services (1, 19); transport, storage and communication (1, 16); electricity, gas and water supply (2, 19). These indicate sectors that show potential for additional development in this does not imply that sectors, that do not feature here, should not be pursued since there may be latent potential in these sectors that could be exploited.

Table 21 below indicates the location quotients of the economic sectors in the municipalities

Table 21: Location Quotients of Economic Sectors

	Kareeberg	Emthanjeni	DMA	Renosterberg	Siyancuma	Siyathemba	Thembelihle	Ubuntu	Umsobomvu
Agriculture	1,18	0,31	1,62	0,54	1,11	1,46	1,47	1,59	0,82
Mining	0,08	0,05	0,45	0,00	4,28	0,09	0,02	0,21	0,00
Manufacturing	0,41	0,71	1,28	0,13	1,92	0,76	1,99	0,91	0,18
Electricity, gas and water supply	0,17	0,60	0,36	11,42	0,08	1,14	0,23	0,00	0,97
Construction	0,52	1,25	0,85	0,58	0,99	1,69	0,48	0,55	1,00
Wholesale and retail trade	1,12	1,05	1,20	0,56	1,02	0,94	1,17	0,79	1,13
Transport, storage and communication	0,52	1,76	0,53	0,33	0,84	0,83	1,33	0,75	0,51
Finance, insurance, real estate	1,06	1,79	0,94	0,46	0,78	0,71	0,61	0,72	0,67
Community, social and personal services	1,18	1,37	0,58	0,54	0,82	0,72	0,56	0,85	1,55

Other sectors in the district that have a distinct comparative advantage with respect to the Northern Cape and South Africa are:

- Electricity, Gas and Water supply
- Community, social and personal services
- Transport, storage and communication

The municipalities in the district that have comparative advantages with respect to the sector Electricity, Gas and Water supply are Renosterberg and Siyathemba with location quotients of 11,42 and 1,14 respectively. This resounding comparative advantage in the sector for the Renosterberg municipality is due to the presence of the Van Der Kloof Dam in the municipality. It is the only sector in which Renosterberg has a comparative advantage with respect to other municipalities in the district.

Kareeberg, Emthanjeni and Umsobomvu have location quotients, with respect to other municipalities in the district, of 1, 18, 1, 37 and 1, 55 respectively in the Community, social and personal services sector. In the Transport, storage and communication sector, Emthanjeni and Thembelihle have location quotients of 1, 76 and 1, 33 respectively, indicating a comparative advantage in this sector with respect to other municipalities in the district. The sectors that contribute significantly to the Northern Cape GDP are highlighted in the table above with agriculture having the highest LQ, Electricity, gas and water supply second highest LQ etc.

The agricultural sector has the potential for growth with a number of comparative and competitive advantages for the Northern Cape and Pixley Ka Seme in particular.

Tress Indicators

The level of diversification or concentration of a region’s economy is measured by a tress index. A tress index of zero represents a totally diversified economy whilst the higher the index, the more concentrated or vulnerable the region’s economy is to exogenous variables e.g. adverse climatic conditions and commodity price fluctuations.

The economy of the Pixley Ka Seme district has a tress index of 56, 18 indicating a reliance of the Pixley Ka Seme economy on the agriculture, transport and services sector. This tress index indicates that the economy is not diversified but is largely dependent on the agriculture and is vulnerable to exogenous variables such as adverse climatic conditions, commodity price fluctuations. We need to look at ways of diversifying the economy

(b) Description of the current land uses.

According to the maps below (Figure 20 and Figure 21) the proposed area is mostly covered in natural vegetation and a small area is used for cultivation. The proposed area also borders the Orange river.

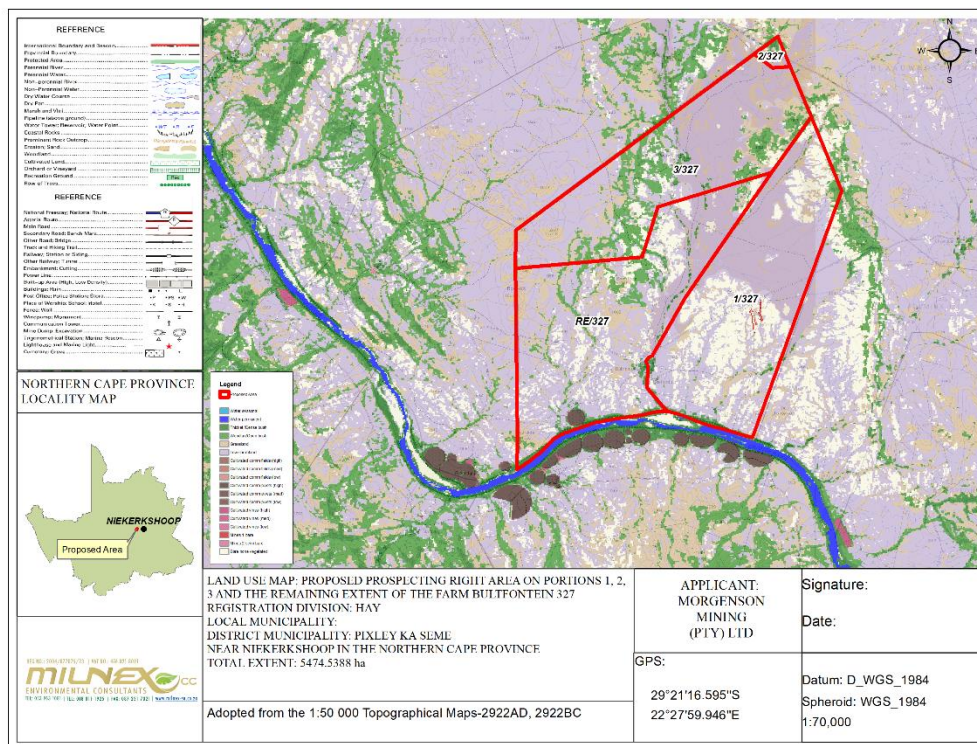


Figure 20: Land use map associated with study site and surrounding areas.

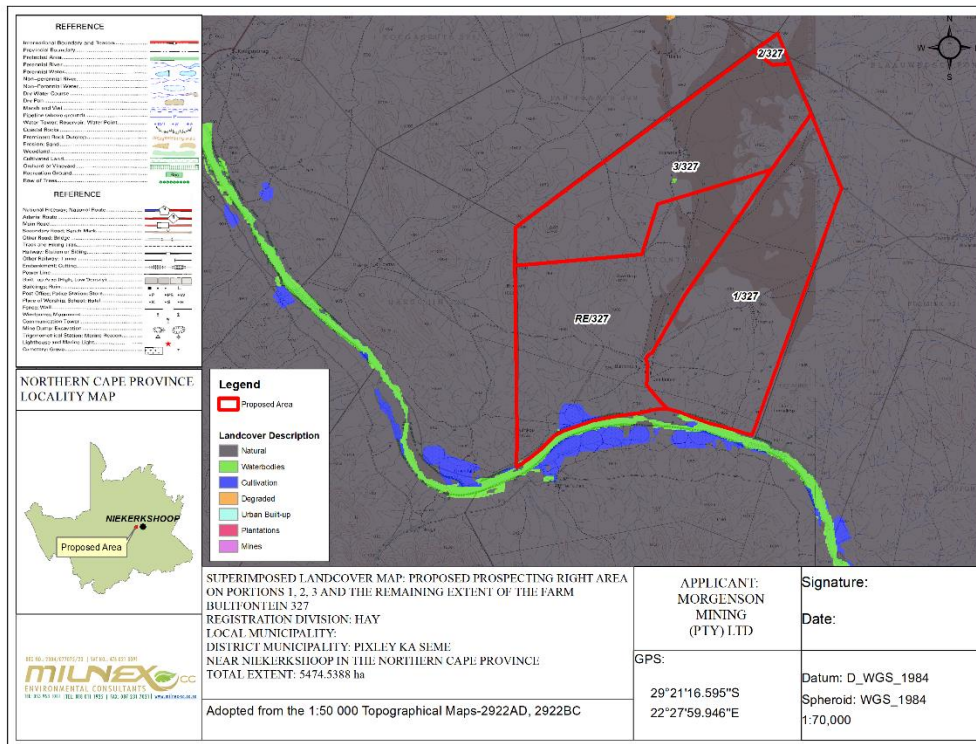


Figure 21: Landcover map associated with study site and surrounding areas.

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 result from the proposed development. Different impacts need to be evaluated in terms of its significance and in doing so highlight the most critical issues to be addressed.

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

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

Impact Rating System

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

- Construction
- Operation
- Decommissioning

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

Table: The rating system

NATURE		
Include a brief description of the impact of environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.
PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).
4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).

3	High	Impact affects the continued viability of the system/ component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		
Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula:		
(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.		
The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.		
Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.

51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

vii) 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;

- Increased ambient noise levels resulting from geophysics surveys site fly-overs and increased traffic movement during all prospecting phases.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on environmental resources utilized by communities, landowners and other stakeholders.
- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion which may impact on ecosystem functioning.
- Increased vehicle activity within the area resulting in the possible destruction and disturbance of fauna and flora.
- Poor access control to farms which may impact on cattle movement, breeding and grazing practices.
- Access control to portion which may impact on cattle movement, breeding and grazing practices of the surrounding community.
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime.
- Potential visual impacts caused by prospecting activities.
- Prospecting will be undertaken by specialist sub - contractors and it is not anticipated that employment opportunities for local and / or regional communities will result from the prospecting activities.
- Negative impacts on the groundwater resources.
- Long-term loss of indigenous vegetation.
- Air pollution due to dust to the surrounding community and hospital.
- Impact on tourism.

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 Scoping and EIR report, as well as response provided is captured and recorded within the Comments and Response Report and will be attached in the final EIR.

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, it is expected that high volumes Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) on the Remaining Extent, Portion 1, Portion 2 and Portion 3 (Boorwater) of the farm Bultfontein 327, Registration Division: Hay, Northern Cape Province.

**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.

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	✘			Specialist study was conducted, please see Appendix 12 . Mitigation measure included in the EMPr.
II. A conservation or open space area		✘		According to the protected areas map the proposed area does not fall within a threatened ecosystem or formally protected area (Appendix 7)
III. An area that is of cultural importance	✘			Specialist study was conducted, please see Appendix 12 . Mitigation measure included in the EMPr.
IV. Site of geological significance		✘		Specialist study was conducted, please see Appendix 12 . Mitigation measure included in the EMPr.
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 7 and 8. It is also mostly covered in natural vegetation (Appendix 5).
VII. Floodplain	✘			Specialist study was conducted, please see Appendix 12 . Mitigation measure included in the EMPr.

VIII. Indigenous forest	×			According to the land use map certain areas is covered in Woodland/Open bush (Appendix 5).
IX. Grass land	×			Specialist study was conducted, please see Appendix 12 . Mitigation measure included in the EMPr.
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			×	Specialist study was conducted, please see Appendix 12 . Mitigation measure included in the EMPr.
XII. Tourist resort		×		
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 R383.
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.		×		Approximately 15 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.		×		The application area will use 2 x 16 feet washing pans, the amount of water for the pans will be 34 000 L/hour from which 30% is re-used.
VIII. Job creation	×			Approximately 15 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 Orange River borders the proposed area.
II. A conservation or open space area		×		
III. An area that is of cultural importance			×	
IV. A site of geological significance			×	
V. An area of outstanding natural beauty	×			
VI. Highly productive agricultural land			×	
VII. A tourist resort			×	
VIII. A formal or informal settlement		×		

Matrix analysis

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

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

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

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									
<p>Listing Notice 1 (GNR 327), Activity 27: "The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation"</p> <p>Listing Notice 3 (GNR 324), Activity 12: "The clearance of an area of 300 square metres or more of indigenous vegetation. (g) Northern Cape (ii) Within critical biodiversity areas identified in bioregional plans;"</p>	<p><u>Site clearing and preparation</u> Areas earmarked for prospecting will need to be cleared, topsoil will be stockpiled separately.</p>	BIOPHYSICAL ENVIRONMENT	Fauna & Flora	<ul style="list-style-type: none"> Loss or fragmentation of indigenous natural vegetation. Loss of sensitive species. Loss or fragmentation of habitats. 		-	S	Yes	-
			Air	<ul style="list-style-type: none"> Air pollution due to the increase of traffic. Dust from mining/prospecting activities 	-		M	Yes	-
			Soil	<ul style="list-style-type: none"> Soil degradation, including erosion. Loss of topsoil. Disturbance of soils and existing land use (soil compaction). 	-	-	S	Yes	-
			Geology	<ul style="list-style-type: none"> It is not foreseen that the removal of indigenous vegetation will impact on the geology or vice versa. 	-		S	Yes	-
			Existing services infrastructure	<ul style="list-style-type: none"> Generation of waste that need to be accommodated at a licensed landfill site. Generation of sewage that need to be accommodated by the local sewage plant. 		-	S	Yes	-
			Ground water	<ul style="list-style-type: none"> Pollution due to construction vehicles. 	-		S	Yes	-
			Surface water	<ul style="list-style-type: none"> Increase in storm water run-off. Pollution of water sources due to soil erosion. Destruction of watercourses (pans/dams/streams/wetlands). 		-	S	Yes	-
		SOCIAL/ECONOMIC ENVIRONMENT	Local unemployment rate	<ul style="list-style-type: none"> Job creation. Business opportunities. Skills development. 		+	S	Yes	-
			Visual landscape	<ul style="list-style-type: none"> Potential visual impact on residents of farmsteads and motorists in close proximity to proposed facility. 	-		L	Yes	-
			Traffic volumes	<ul style="list-style-type: none"> Increase in construction vehicles. 	-		S	Yes	-
			Health & Safety	<ul style="list-style-type: none"> Air/dust pollution. Road safety. Increased risk of veld fires. 		-	S	Yes	-
			Noise levels	<ul style="list-style-type: none"> The generation of noise as a result of construction vehicles, the use of machinery such as drills, excavators, dumper trucks and people working on the site. 	-		L	Yes	-
			Tourism industry	<ul style="list-style-type: none"> Since there are no tourism facilities in close proximity to the site, the construction activities will not have an impact on tourism in the area. 	N/A	N/A	N/A	N/A	-
Heritage resources	<ul style="list-style-type: none"> Removal or destruction of archaeological and/or paleontological sites. Removal or destruction of buildings, structures, places and equipment of cultural significance. Removal or destruction of graves, cemeteries and burial grounds. 		-	L	Yes	-			

OPERATIONAL PHASE									
<p>Listing notice 1 (GNR327), Activity 9: “The development of infrastructure exceeding 1 000 metres 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;”</p> <p>Listing notice 1 (GNR 327), Activity 10: “The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;”</p> <p>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: (ii) a watercourse;</p> <p>Listing Notice 1 (GNR 327), Activity 20: “Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] (b) the primary processing of a petroleum resource including winning, extraction, classifying, concentrating or water removal; –</p> <p>Listing Notice 2 (GNR 325), Activity 19: “The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource or (b) [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;</p> <p>NEM:WA 59 of 2008: Residue stockpiles or residue deposits, Category A: (15) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</p>	<p>The key components of the proposed project are described below:</p> <ul style="list-style-type: none"> • Supporting Infrastructure - A control facility with basic services such as water and electricity will be constructed on the site and will have an approximate footprint 50m² or less. Other supporting infrastructure includes a site office and workshop area. • Roads - Access will be obtained from existing roads on the proposed portion. • Fencing - For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farm. 	BIO PH S	Fauna & Flora	<ul style="list-style-type: none"> • Fragmentation of habitats. • Establishment and spread of declared weeds and alien invader plants (operations). 	-	-	L	Yes	-
			Air quality	<ul style="list-style-type: none"> • Air pollution due to the mining / prospecting activity and transport of the gravel to the designated areas. 	-	-	S	Yes	-
			Soil	<ul style="list-style-type: none"> • Soil degradation, including erosion. • Disturbance of soils and existing land use (soil compaction). • Loss of agricultural potential (Low - medium significance relative to agricultural potential of the site). 	-	-	L	Yes	-
			Geology	<ul style="list-style-type: none"> • Collapsible soil. • Seepage (shallow water table). • Active soil (high soil heave). • Erodible soil. • The presence of undermined ground. • Instability due to soluble rock. • Steep slopes or areas of unstable natural slopes. • Areas subject to seismic activity. • Areas subject to flooding. 	-	-	L	Yes	-
			Existing services infrastructure	<ul style="list-style-type: none"> • Generation of waste that need to be accommodated at a licensed landfill site. • Generation of sewage that need to be accommodated by the municipal sewerage system and the local sewage plant. • Increased consumption of water, dust suppression. 	-	-	L	Yes	-
			Ground water	<ul style="list-style-type: none"> • Leakage of hazardous materials. The machinery on site require oils and fuel to function. Leakage of these oils and fuels can contaminate water supplies. 	-	-	L	Yes	-
			Surface water	<ul style="list-style-type: none"> • Increase in storm water runoff. The development will potentially result in an increase in storm water run-off that needs to be managed to prevent soil erosion. • Destruction of watercourses (pans/dams/streams). • 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	<ul style="list-style-type: none"> • Job creation. Security guards will be required for 24 hours every day of the week. • Skills development. 	-	-	L	Yes	-
			Visual landscape	<ul style="list-style-type: none"> • The proposed portions are used for livestock grazing and crop production which will still take place simultaneously with the prospecting activity, however this depends on the location of the activity. 	-	-	L	Yes	-
			Traffic volumes	<ul style="list-style-type: none"> • Increase in vehicles collecting gravel for distribution. 	-	-	S	Yes	-
			Health & Safety	<ul style="list-style-type: none"> • Air/dust pollution. • Road safety. 	-	-	S	Yes	-
			Noise levels	<ul style="list-style-type: none"> • The proposed development will result in noise pollution during the operational phase. 	-	-	M	Yes	-
			Tourism industry	<ul style="list-style-type: none"> • Since there are tourism facilities in close proximity to the site, the decommissioning activities may have an impact on tourism in the area. 	N/A	N/A	N/A	N/A	-
Heritage resources	<ul style="list-style-type: none"> • It is not foreseen that the proposed activity will impact on heritage resources or vice versa. 	N/A	N/A	N/A	N/A	-			
DECOMMISSIONING PHASE									
-	<u>Mine closure</u>	BIO PH	Fauna & Flora	<ul style="list-style-type: none"> • Re-vegetation of exposed soil surfaces to ensure no erosion in these areas. 	-	+	L	Yes	-

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

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

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:

Loss or fragmentation of indigenous natural fauna and flora:

The proposed area falls within vegetation units NKb 1 and NKu 3, which is known as the Lower Gariep Broken Veld and Northern Upper Karoo. The Lower Gariep Broken Veld is part of the Bushmanland & West Griqualand bioregion and Northern Upper Karoo is part of the Upper Karoo Bioregion. Both are a sub-bioregion for the Nama-Karoo Biome.

Lower Gariep Broken Veld

Mucina and Rutherford (2006:334) states that the conservation of the Lower Gariep Broken Veld is least threatened with a target of 21%. Only 4% is statutorily conserved in the Augrabies Falls National Park and only a very small part is transformed. The erosion is very low at 27%, low at 58% and moderate at 14%.

Northern Upper Karoo

Mucina and Rutherford (2006:340) also states that the conservation of the Northern Upper Karoo, is Least Threatened with a target of 21%. About 4% has been cleared for cultivation (the highest proportion of any type in the Nama-Karoo) or irreversibly transformed by building of dams (Houwater, Kalkfontein and Smart Syndicate Dams). Areas of human settlements are increasing in the north-eastern part of this vegetation types. Erosion is moderate at 46.2%, very low at 32% and low at 20%. According to Hoffman *et al.* (1999) as stated by Mucina and Rutherford (2006:340) *Prosopis* occurs in generally isolated patches, with densities ranging from very scattered to medium (associated with the lower Vaal River drainage system and the confluences with the Orange River) to localised closed woodland on the western borders of the unit with Bushmanland Basin Shrubland.

According to the Prospecting Work Programme (PWP), 90 pits [3m (length) x 3m (breath) x 4m (depth)] and 45 trenches [40m (length) x 40m (breath) x 3m (depth)] will be dug. According to the calculations it will be a disturbance of $\pm 7,281$ ha.

According to **Figure 20** and **Figure 21** the proposed area is mostly covered in natural vegetation and a small area is used for cultivation. The proposed area also borders the Orange river.

The Ecological and Wetland Impact Assessment Report (**Appendix 12**) findings:

- According to the National Threatened Ecosystem database (2011), no threatened ecosystems overlaps with the study site.
- According to the Northern Cape Critical biodiversity Areas and map (2016), study area was observed to overlap a CBA1 area on the Southern border. A major drainage line, and its associated Riparian areas running the length of the study area was observed to be an ESA area, along with other sections on the Western side of the study area.
- According to the National Freshwater Ecosystem Priority Areas Database (NFEP, 2011), one (1) HGM unit (Floodplain) was present on site. A site visit confirmed the presence of the Floodplain, along with its associated drainage lines, referred to in this report as riparian areas (Figure 13).
- Came Thorn (*Vachellia erioloba*) and Sheperd's (*Boscia albitrunca*) trees, Protected Tree species of South Africa, were recorded on site.
- Exotic and Invasive Vegetation Species such were recorded on site (Table 8).

- For Avifaunal species potentially occurring on site, and that enjoy conservation status in the IUCN Red List, kindly refer to section 4.2.1 (Table 9) for a species list.
- Several species possibly occurring on site are protected under Tops and NEMBA, although not observed during the site visit.
- The Endangered (IUCN, 2021) African Spurred tortoise (*Centrochelys sulcata*), Cape cobra (*Naja niveawas*) and Rock monitor (*Varanus albigularis*) was observed on site. Based on the Frog Atlas of South Africa, the Near Threatened Giant Bullfrog (*Pyxicephalus adspersus*) and Tremelo Sand Frog (*Tomopterna cryptotis*) are expected to occur on site.

A Floodplain wetland and Riparian areas (Ephemeral drainage lines) were recorded on the study site. The results are summarised in the table below:

Classification	Scientific Buffer	PES	EIS	REC
Floodplain	48m	C	Very High	B Improve
Riparian areas	37m	C	High	B/C Improve

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

NEMA Impact assessment	Most of the impacts associated with the prospecting activities range from High to Medium-Low prior to mitigation taking place. With mitigation fully implemented, the significance of most impacts can be reduced to Medium-High to Very-Low
DWS Risk assessment	All the impacts associated with the prospecting activities are ranked as Low to High, with most impacts presenting Medium ranking
Mitigation Measures	Refer to Section 6.5

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. Therefore, the proposed prospecting operations can be considered from an ecological conservation point of view. During the construction, operational and decommissioning phases all recommendations made and concerns raised in this document should be taken into consideration. A good closure and rehabilitation plan should be in place to rehabilitate the habitat for faunal and floral species and active alien and invasive vegetation removal and monitoring should take place in accordance with an Alien Invasive Vegetation Management Plan

Loss or fragmentation of indigenous natural fauna and flora	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Definite (4)	Definite (4)
Duration	Long term (3)	Medium (2)
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	Medium cumulative impacts (3),	
Significance	Negative high (51)	Negative low (28)
Can impacts be mitigated?	<p>If the development is approved, contractors must ensure that no mammalian species are disturbed, trapped, hunted or killed. If the development is approved, every effort should be made to confine the footprint to the blocks allocated for the development and have the least possible edge effects on the surrounding area. The EMPr also provides numerous mitigation measures – refer to section (f) of the EMPr.</p> <p>The potential impacts associated with damage to and loss of farmland should be effectively mitigated. The aspects that should be covered include:</p> <ul style="list-style-type: none"> • The site should be fenced off prior to commencement of construction activities; 	

	<ul style="list-style-type: none"> • The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be confined to the fenced off area and minimised where possible; • An Environmental Control Officer (ECO) should be appointed to monitor the establishment phase of the construction phase; • All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase; • The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. Specifications for the rehabilitation are provided throughout the EMPr – section (f) of the EMPr. • The implementation of the Rehabilitation Programme should be monitored by the ECO.
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- Loss or fragmentation of habitats – According to the DEA Screening Report the Terrestrial Biodiversity theme sensitivity of the proposed area fall within high and low sensitivity. The Animal Species theme sensitivity of the proposed area fall mostly in medium sensitivity and a very small area within high and low sensitivity.

According to **Figure 20 and Figure 21** the proposed area is mostly covered in natural vegetation and a small area is used for cultivation. The proposed area also borders the Orange river.

Loss or fragmentation of habitats	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Site (1)	Site (1)
Probability	Probable (3)	Probable (3)
Duration	Long term (3)	Medium (2)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Medium cumulative impacts (3),	
Significance	Negative medium (45)	Negative low (26)
Can impacts be mitigated?	Exotic and invasive plant species should not be allowed to establish, if the development is approved. Where exotic and invasive plant species are found at the site continuous eradication should take place. If the development is approved, every effort should be made to confine the footprint to the blocks allocated for development – section (f) of the EMPr also provides numerous mitigation measures related to fauna and flora.	

- 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	Definite (4)	Possible (2)
Duration	Permanent (4)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Completely reversible (1)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal loss (2)
Cumulative impact	High cumulative impact (4).	
Significance	Negative high (57)	Negative Low (24)
Can impacts be mitigated?	The following mitigation or management measures are provided: <ul style="list-style-type: none"> • If an activity will mechanically disturb below surface in any way, then any available topsoil should first be stripped from the entire surface and stockpiled for re-spreading during rehabilitation. • Topsoil stockpiles must be conserved against losses through erosion by establishing vegetation cover on them. 	

	<ul style="list-style-type: none"> • Dispose of all subsurface spoils from excavations where they will not impact on undisturbed land. • During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface. • Erosion must be controlled where necessary on top soiled areas. <p>Establish an effective record keeping system for each area where soil is disturbed for constructional purposes. These records should be included in environmental performance reports, and should include all the records below.</p> <ul style="list-style-type: none"> • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation of constructional (or operational) activities at the particular site. • Photograph the area on cessation of constructional activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time. <p>Section (f) of the EMPr also provide mitigation measures related to topsoil management.</p>
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- **Soil erosion** – Soil erosion due to alteration of the land surface run-off characteristics. Alteration of run-off characteristics may be caused by construction related land surface disturbance, vegetation removal and the establishment of roads. Erosion will cause loss and deterioration of soil resources. The erosion risk is low due to the low slope gradients.

Soil erosion	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Geographical extent	Site (1)	Site (1)
Probability	Possible (2)	Possible (2)
Duration	Long term (3)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Significant loss of resource (3)	Marginal (2)
Cumulative impact	Medium cumulative impact (3).	
Significance	Negative Medium (42)	Negative low (22)
Can impacts be mitigated?	<p>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.</p> <p>Include periodical site inspection in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence any erosion on site or downstream – refer to section (f) of the EMPr.</p>	

- **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 unlikely to be significant; but activities should be limited to normal working days and hours (6:00 – 18:00).

Temporary noise disturbance	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Definite (4)	Probable (3)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	Medium (2)

Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss (2)	Marginal loss (2)
Cumulative impact	Medium cumulative impact (3).	
Significance	Negative medium (42)	Negative low (26)
Can impacts be mitigated?	Yes, management actions related to noise pollution are included in section (f) of the EMPr.	

- Generation of waste - general waste, construction waste, sewage and grey water - The workers on site are likely to generate general waste such as food wastes, packaging, bottles, etc. Construction waste is likely to consist of packaging, scrap metals, waste cement, etc (if any). The applicant will need to ensure that general and construction waste is appropriately disposed of i.e. taken to the nearest licensed landfill. Sufficient ablution facilities must be provided, in the form of portable/VIP toilets. 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	Possible (2)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2) - An additional demand for landfill space could result in significant cumulative impacts if services become unstable or unavailable, which in turn would negatively impact on the local community.	
Significance	Negative medium (30)	Negative medium (30)
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.	

- Impacts on heritage objects –

The impact assessment according to the Phase 1 Heritage Impact Assessment for all the Heritage Resources Identified is as follows:

Heritage impacts are categorised as:		
<ul style="list-style-type: none"> • Direct or physical impacts, implying alteration or destruction of heritage features within the project boundaries; • Indirect impacts, e.g. restriction of access or visual intrusion concerning the broader environment; • Cumulative impacts that are combinations of the above. 		
7.1.1 Type: Chance find Stone Age material.		
Impact assessment: Although this material is found inside the project area, their low significance as well as the fact that the area has already extensively been disturbed as surface occurrences flooding the plain, the impact is viewed to be very low.		
	Without mitigation	With mitigation
Extent	Local area (1)	Local area (1)
Duration	Permanent (5)	Permanent (5)
Intensity	Low (1)	Low (1)
Probability	Improbable (2)	Improbable (2)
Significance	Low (14)	Low (14)
Status (positive or negative)	Negative	Neutral
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated	No	
Mitigation: None		
Cumulative impact: Loss of limited amount of similar features in the larger landscape.		

7.3.1.1 – 7.3.1.7 Type: Burial sites		
Impact assessment		
These sites are located inside the larger project area and therefore it might be impacted on by the proposed prospecting activities.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Permanent (5)	Permanent (5)
Intensity (Magnitude)	Moderate (6)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Medium (36)	Low (16)
Status (positive or negative)	Negative	Neutral
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated	Yes	
Cumulative impact: Loss of a limited number of similar features in the larger landscape.		

7.3.2.1 Type: Farmstead		
Impact assessment		
Although this feature is located inside the larger project area, it is unlikely that it would be impacted on by the proposed prospecting activities.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Permanent (5)	Permanent (5)
Intensity (Magnitude)	Low (4)	Small (0)
Probability	Improbable (2)	Improbable (2)
Significance	Low (20)	Low (12)
Status (positive or negative)	Neutral	Neutral
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated	Yes	
Cumulative impact: Loss of a limited number of similar features in the larger landscape.		

7.3.2.2 Type: Industrial remains – Asbestos Mine		
Impact assessment		
Although this feature is located inside the larger project area, it is unlikely that it would be impacted on by the proposed prospecting activities due to the danger that the asbestos contamination poses.		
	Without mitigation	With mitigation
Extent	Site (1)	Site (1)
Duration	Permanent (5)	Permanent (5)
Intensity (Magnitude)	Low (4)	Small (0)
Probability	Improbable (2)	Improbable (2)
Significance	Low (20)	Low (12)
Status (positive or negative)	Neutral	Neutral
Reversibility	Non-reversible	Non-reversible
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated	Yes	
Cumulative impact: Loss of a limited number of similar features in the larger landscape.		

8.2 Mitigation measures

- For the current study, the following mitigation measures are proposed.

7.1.1 Type: Chance finds Stone Age material
Mitigation
(5) No further action required: This is applicable only where sites or features have been rated to be of such low significance that it does not warrant further documentation, as it is viewed to be fully documented after inclusion in this report.

<p>7.3.1.1 – 7.3.1.7 Type: Burial sites</p> <p>Mitigation</p> <p>(1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and applies where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.</p> <ul style="list-style-type: none"> • If it is decided to retain the burial site, it should be fenced off permanently by means of a wire fence or brick wall, with a buffer zone of at least 100m. <p>Requirements</p> <p>In the event of an impact occurring on the identified burial site, a permit for mitigation and/or destruction must be obtained from SAHRA/PHRA prior to any work being carried out.</p> <ul style="list-style-type: none"> • The appropriate steps to take are indicated in Section 9 of the report, as well as in the Management Plan: Burial Grounds and Graves, with reference to general heritage sites, in the Addendum, Section 13.5.
<p>7.3.2.1 Type: Farmstead</p> <p>Mitigation</p> <p>(2) Archaeological investigation: This is appropriate where development occurs in a context of heritage significance and where the impact is such that it can be mitigated. Mitigation is to document the site (map and photograph) and analyse the recovered material to acceptable standards.</p> <ul style="list-style-type: none"> • This option should be implemented when it is impossible to avoid impacting on an identified site or feature. <p>Requirements: In the event of an impact occurring on the identified site or feature, a permit for mitigation and/or destruction must be obtained from SAHRA/PHRA prior to any work being carried out.</p>
<p>7.3.2.2 Type: Asbestos mine</p> <p>Mitigation</p> <p>(1) Avoidance: This site should be avoided for reasons other than its possible heritage value, i.e. the potential health hazard that asbestos pollution poses.</p> <p>Requirements: In the event of an impact occurring on the identified site or feature, a permit for mitigation and/or destruction must be obtained from SAHRA/PHRA prior to any work being carried out.</p>

Please see the findings of the Palaeontological Desktop Assessment below:

The proposed Diamond Prospecting Right Application near Prieska is underlain by Quaternary deposits, Tertiary calcretes and the Ghaap Group (Transvaal Supergroup, Griqualand West Basin). According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Quaternary sediments is Low, that of the Tertiary Calcrete is High, while the Palaeontological Sensitivity of the Ghaap Group is Moderate (Almond and Pether 2008, SAHRIS website). A Low Palaeontological Significance has been allocated to the proposed Prospecting Right Application. It is therefore considered that the proposed development is believed to be appropriate and will not lead to detrimental impacts on the palaeontological reserves of the area.

If Palaeontological Heritage is uncovered during surface clearing and excavations the Chance find Protocol attached should be implemented immediately

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.

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.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

Impacts on heritage objects	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	Short term (1)	Short term (1)
Magnitude	Medium (2)	Low (1)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	Low cumulative impact (2). Should these impacts occur, there may be a cumulative impact on the preservation of heritage objects in the area.	
Significance	Negative low (24)	Negative low (12)
Can impacts be mitigated?	<p>If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. Also refer to section (f) of the EMPr.</p> <p>The following shall apply:</p> <ul style="list-style-type: none"> • 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 	

	<p>palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).</p> <p>In order to achieve this, the following should be in place:</p> <ul style="list-style-type: none"> • A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage. • Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above. • In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.
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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 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. While the volume of traffic along this gravel road off the R383 is low, the movement of heavy vehicles along this road is likely to damage the road surface and impact on other road users. The contractor should be required to ensure that damage to the road is repaired periodically. The movement of additional heavy vehicle traffic will add significantly to the current traffic load on the road. The impact on the roads is therefore likely to be moderate.

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)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	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 low impacts (26)	Negative low (11)
Can impacts be mitigated?	<p>The potential impacts associated with heavy vehicles can be effectively mitigated. The mitigation measures include:</p> <ul style="list-style-type: none"> • The contractor must ensure that damage caused by construction on the 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. <p>Also refer section (f) of the EMPr. For mitigation measures related to traffic.</p>	

- 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 farmers 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 mine 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	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	Marginal resource (2)	Marginal resource (2)
Cumulative impact	Low cumulative effects (2), provided losses are compensated for.	
Significance	Negative medium (36)	Negative low (20)
Can impacts be mitigated?	<p>Key mitigation measures include:</p> <ul style="list-style-type: none"> • 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 losses and costs associated with fires caused by construction workers or construction related activities (see below); • The Environmental Management Programme (EMPr) should outline procedures for managing and storing waste on site, specifically plastic waste that poses a threat to livestock if ingested; • Contractors appointed 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, wildlife 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 different phase of prospect.

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	Very high (4)	Low (1)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Significant loss (3)	Marginal loss (2)
Cumulative impact	Medium cumulative effects (3), provided losses are compensated for.	
Significance	Negative high (64)	Negative low (12)
Can impacts be mitigated?	<p>The mitigation measures include:</p> <ul style="list-style-type: none"> • A fire-break should be constructed around the perimeter of the site prior to the commencement of the construction phase; • Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas; • Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, windy winter months; • Contractor to provide adequate firefighting equipment on-site, including a fire fighting vehicle; • Contractor to provide fire-fighting training to selected construction staff; • No construction staff, with the exception of security staff, to be accommodated on site over night; • As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the firefighting costs borne by farmers and local authorities. 	

OPERATIONAL PHASE

Direct impacts: During the operational phase the study area will serve as 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:

- **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)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Completely reversible (1)
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 (54)	Negative Low (22)

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

Change in land use	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Possible (2)
Duration	medium term (2)	medium term (2)
Magnitude	Medium (2)	Medium (2)
Reversibility	Partly reversible (2)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	No loss of resource (1)
Cumulative impact	Low cumulative impacts (2).	
Significance	Negative low (24)	Negative low (20)
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 Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) 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)	Medium (2)
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 low (24)
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 and concurrent rehabilitation must be implemented.

Increase in storm water runoff	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Probable (3)	Unlikely (1)
Duration	Long term (3)	Medium term (2)
Magnitude	Medium (2)	Low (1)
Reversibility	Barely reversible (3)	Completely reversible (1)
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 impacts on the wider area.	

Significance	Negative medium (34)	Negative low (10)
Can impacts be mitigated?	<p>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</p> <p>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.</p> <p>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.</p> <p>If these practices is found to be insufficient for the control of storm water and sedimentation, other alternatives should immediately be investigated and implemented.</p>	

Increased consumption of water - Since 2 x 16 feet washing pans will be used, the amount of water for the pans will be 34 000 L/hour from which 30% is re-used. Water will also be used for dust suppression.

Increased consumption of water	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Region (3)	Region (3)
Probability	Definite (4)	Definite (4)
Duration	Medium term (2)	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	Medium cumulative impacts (3) - An additional demand on water sources could result in a significant cumulative impact with regards to the availability of water.	
Significance	Negative high impact (57)	Negative medium (38)
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 from 6:00 – 18:00, Monday to Saturday. Sources of general waste will be waste food, packaging, paper, etc. General waste will be stored on the site and removed on a weekly basis to a license landfill site.

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 (2)
Magnitude	medium (2)	Low (1)
Reversibility	Partly reversible (2)	Partly reversible (2)
Irreplaceable loss of resources	Marginal of resource (2)	No loss of resource (1)
Cumulative impact	Low cumulative impact (2) - An additional demand for landfill space could result in significant cumulative impacts with regards to the availability of landfill space.	
Significance	Negative low (28)	Negative low (13)
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	Regional (3)	Local (2)
Probability	Possible (2)	Unlikely (1)
Duration	Long term (3)	Short term (1)
Magnitude	High (3)	Medium (2)
Reversibility	Barely reversible (3)	Partly reversible (2)
Irreplaceable loss of resources	Significant loss of resources (3)	Marginal loss of resource (2)
Cumulative impact	High cumulative impacts (4) if impact occurs and not mitigated.	
Significance	Negative high (54)	Negative low (24)
Can impacts be mitigated?	Yes. 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 approximately 5 years. Sources of noise are likely to include vehicles, the use of machinery such as backactors, rotary pans and people working on site. Noise may impact on the existing activities however, this depends on where the prospecting activities will take place, which will only be determined during Phase 1 and Phase 2 (PWP) of the prospecting activities.

Existing activities on the proposed area include but is not limited to agricultural activities (game and livestock grazing, crop production under a central pivot irrigation system and) and homesteads.

Temporary noise disturbance	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Possible (2)	Possible (2)
Duration	Medium term (2)	Medium term (2)
Magnitude	High (3)	Medium (2)
Reversibility	Completely reversible (1)	Completely reversible (1)
Irreplaceable loss of resources	Marginal loss of resource (2)	Marginal loss of resource (2)
Cumulative impact	The impact would result in medium cumulative effects (3).	
Significance	Negative medium (36)	Negative low (24)
Can impacts be mitigated?	Yes, management actions related to noise pollution are included in section (f) of the EMPr.	

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), Diamonds General (D) and Diamonds in Kimberlite (DK) on the areas sense of place with mitigation is likely to be medium to low. In addition, the site will not be visible from the existing gravel roads depending on where prospecting activities will occur.

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	Marginal loss of resources (2)	Marginal loss of resources (2)
Cumulative impact	Medium cumulative impacts (3)	
Significance	Negative low (11)	Negative low (11)
Can impacts be mitigated?	The proponent may compensate the income losses the Apiesdeed Fishing Report may endure due to loss of visitors as a result of the prospecting activities. Proof must be provided that losses are due to prospecting activities.	

DECOMMISSIONING PHASE (MINE CLOSURE AND REHABILITATION)

Direct impacts: Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live. If infrastructures are removed after a 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 to its pre-prospecting state. The areas that was prospected must be rehabilitated in such a way that it can support the existing pre-prospecting activity of that specific area. Existing pre-prospecting activities include but is not limited to agricultural activities (game and livestock grazing, crop production under a central pivot irrigation system and an orchard) and a fishing resort.

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	Possible (2)	Definite (4)
Duration	Permanent (4)	Permanent (4)
Magnitude	Very High (4)	Very High (4)
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 (28)	Positive medium (36)
Can impacts be mitigated?	No mitigation measures required.	

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

Loss of employment	Pre-mitigation impact rating	Post mitigation impact rating
Status (positive or negative)	Negative	Negative
Extent	Local (2)	Local (2)
Probability	Probable (3)	Probable (3)
Duration	Permanent (4)	Permanent (4)
Magnitude	Medium (2)	Medium (2)
Reversibility	Irreversible (4)	Irreversible (4)
Irreplaceable loss of resources	No loss of resource (1)	No loss of resource (1)
Cumulative impact	Low cumulative impacts (2)	
Significance	Negative medium (32)	Negative medium (32)
Can impacts be mitigated?	The following mitigation measures are recommended: <ul style="list-style-type: none"> All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning; 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.
<p>Palaeontological Desktop Assessment conducted by Elize Butler from Banzai Environmental</p>	<p>FINDINGS AND RECOMMENDATIONS</p> <p>The proposed Diamond Prospecting Right Application near Prieska is underlain by Quaternary deposits, Tertiary calcretes and the Ghaap Group (Transvaal Supergroup, Griqualand West Basin). According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Quaternary sediments is Low, that of the Tertiary Calcrete is High, while the Palaeontological Sensitivity of the Ghaap Group is Moderate (Almond and Pether 2008, SAHRIS website). A Low Palaeontological Significance has been allocated to the proposed Prospecting Right Application. It is therefore considered that the proposed development is believed to be appropriate and will not lead to detrimental impacts on the palaeontological reserves of the area.</p> <p>If Palaeontological Heritage is uncovered during surface clearing and excavations the Chance find Protocol attached should be implemented immediately. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources 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) so that mitigation (recording and collection) can be carried out.</p> <p>Before any fossil material can be collected from the development site the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012).</p> <p>These recommendations should be incorporated into the Environmental Management Plan for the proposed development.</p>	<p style="text-align: center;">X</p>	<p>Pages: 59-60, 79-80, 95, 103-104, 127-128, 148-49</p>

<p>Ecological and Wetland Impact Assessment report conducted by Khume Mtshweni (Ecologist) from Milnex CC</p>	<p>CONCLUSION</p> <ul style="list-style-type: none"> • According to the National Threatened Ecosystem database (2011), no threatened ecosystems overlaps with the study site. • According to the Northern Cape Critical biodiversity Areas and map (2016), study area was observed to overlap a CBA1 area on the Southern border. A major drainage line, and its associated Riparian areas running the length of the study area was observed to be an ESA area, along with other sections on the Western side of the study area. • According to the National Freshwater Ecosystem Priority Areas Database (NFEP, 2011), one (1) HGM unit (Floodplain) was present on site. A site visit confirmed the presence of the Floodplain, along with its associated drainage lines, referred to in this report as riparian areas (Figure 13). • Came Thorn (<i>Vachellia erioloba</i>) and Sheperd's (<i>Boscia albitrunca</i>) trees, Protected Tree species of South Africa, were recorded on site. • Exotic and Invasive Vegetation Species such were recorded on site (Table 8). • For Avifaunal species potentially occurring on site, and that enjoy conservation status in the IUCN Red List, kindly refer to section 4.2.1 (Table 9) for a species list. • Several species possibly occurring on site are protected under Tops and NEMBA, although not observed during the site visit. • The Endangered (IUCN, 2021) African Spurred tortoise (<i>Centrochelys sulcata</i>), Cape cobra (<i>Naja niveawas</i>) and Rock monitor (<i>Varanus albigularis</i>) was observed on site. Based on the Frog Atlas of South Africa, the Near Threatened Giant Bullfrog (<i>Pyxicephalus adspersus</i>) and Tremelo Sand Frog (<i>Tomopterna cryptotis</i>) are expected to occur on site. <p>A Floodplain wetland and Riparian areas (Ephemeral drainage lines) were recorded on the study site. The results are summarised in the table below:</p> <table border="1"> <thead> <tr> <th>Classification</th> <th>Scientific Buffer</th> <th>PES</th> <th>EIS</th> <th>REC</th> </tr> </thead> <tbody> <tr> <td>Floodplain</td> <td>48m</td> <td>C</td> <td>Very High</td> <td>B Improve</td> </tr> <tr> <td>Riparian areas</td> <td>37m</td> <td>C</td> <td>High</td> <td>B/C Improve</td> </tr> </tbody> </table> <p>The allocation of buffers/exclusion zones was in accordance with the wetlands PES as well as EIS. The allocated buffers can be reviewed. Various potential impacts are associated with the proposed Prospecting activities and are discussed in the impact assessment scores derived according to the amended EIA Regulations (2017).</p>	Classification	Scientific Buffer	PES	EIS	REC	Floodplain	48m	C	Very High	B Improve	Riparian areas	37m	C	High	B/C Improve	<p style="text-align: center;">X</p>	<p>Pages: 36, 40, 44-48, 50-54, 73-74, 94-95, 97, 114-118, 134-138, 155-159</p>
Classification	Scientific Buffer	PES	EIS	REC														
Floodplain	48m	C	Very High	B Improve														
Riparian areas	37m	C	High	B/C Improve														

	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #cccccc; width: 30%;">NEMA Impact assessment</td> <td>Most of the impacts associated with the prospecting activities range from High to Medium-Low prior to mitigation taking place. With mitigation fully implemented, the significance of most impacts can be reduced to Medium-High to Very-Low</td> </tr> <tr> <td style="background-color: #cccccc;">DWS Risk assessment</td> <td>All the impacts associated with the prospecting activities are ranked as Low to High, with most impacts presenting Medium ranking</td> </tr> <tr> <td style="background-color: #cccccc;">Mitigation Measures</td> <td>Refer to Section 6.5</td> </tr> </table> <p>It is imperative that an effective management plan is implemented to ensure that all mitigation measures discussed in the report are adhered to. It is also important for the operations to be conducted outside of the recommended exclusion buffers Therefore, the proposed prospecting operations can be considered from an ecological conservation point of view. During the construction, operational and decommissioning phases all recommendations made and concerns raised in this document should be taken into consideration. A good closure and rehabilitation plan should be in place to rehabilitate the habitat for faunal and floral species and active alien and invasive vegetation removal and monitoring should take place in accordance with an Alien Invasive Vegetation Management Plan.</p>	NEMA Impact assessment	Most of the impacts associated with the prospecting activities range from High to Medium-Low prior to mitigation taking place. With mitigation fully implemented, the significance of most impacts can be reduced to Medium-High to Very-Low	DWS Risk assessment	All the impacts associated with the prospecting activities are ranked as Low to High, with most impacts presenting Medium ranking	Mitigation Measures	Refer to Section 6.5		
NEMA Impact assessment	Most of the impacts associated with the prospecting activities range from High to Medium-Low prior to mitigation taking place. With mitigation fully implemented, the significance of most impacts can be reduced to Medium-High to Very-Low								
DWS Risk assessment	All the impacts associated with the prospecting activities are ranked as Low to High, with most impacts presenting Medium ranking								
Mitigation Measures	Refer to Section 6.5								
<p>Baseline Hydrogeological Investigation prepared by Marietjie Kruger from Milnex CC</p>	<p><u>CONCLUSION AND RECOMMENDATIONS</u></p> <p>Six (6) boreholes (BF-BH1 – BH6) were identified on portion 3 of the farm Bultfontein 327 during the field investigation conducted on the 16th of February 2022 (refer to Table 5-2). Seven (7) hydrocensus boreholes (JP-BH1 – BH7) were identified on the remaining extent of Jan Plaats 328, while six (6) boreholes (BBF-BH1 – BH6) were identified on portion 1 of the farm Blaauwboschfontein 330. No groundwater abstraction will take place for mining purposes.</p> <p>The static groundwater levels ranged between 7.55 and 31.5mbgl. Groundwater samples were collected from BF-BH1 and BBF-BH3 and submitted to an accredited laboratory for inorganic analysis. Constituents of concern were identified in BF-BH1, however can be associated with soil-rock-water interaction. The water is not suitable for human consumption without treatment</p> <p>Groundwater abstracted from BF-BH1, JP-BH3 – BH6, BBF-BH3 and BH4 were used for domestic purposes. Groundwater within the area is mainly used for livestock watering, domestic use and small-scale irrigation.</p> <p>The following recommendations were made:</p>	<p>X</p>	<p>Pages: 163-164</p>						

	<ul style="list-style-type: none"> • It is recommended that stormwater management and water recycling be implemented to ensure water runoff are limited to downgradient water bodies or water users; • Based on the groundwater laboratory results, consumption of water from BF-BH1 is not suitable for human consumption without treatment; • Given the low likelihood for the tailings material to impact on the groundwater, it is recommended that motivation is provided for a Type 4 Classification; • Groundwater monitoring should be undertaken in accordance with SANS and DWS requirements in line with the recommended schedule. BF-BH1 and BH6 are recommended to be monitored; and • An annual compliance report should be compiled and submitted to the authorities for evaluation and comment. The monitoring network should be updated annually, and this report should be submitted annually. 		
<p>Phase 1 Cultural Heritage Impact Assessment conducted by J.A. van Schalkwyk</p>	<p><u>CONCLUSIONS AND RECOMMENDATIONS</u></p> <p>The cultural landscape qualities of the region are made up of a pre-colonial element consisting of Stone Age and a much later colonial (farmer) component, which eventually also gave rise to an industrial (mining) component which manifest in a number of sites spread across the larger landscape.</p> <p><u>Identified sites</u> During the survey, the following sites, features or objects of cultural significance were identified.</p> <ul style="list-style-type: none"> • 7.1.1 Change finds: A very low number of stone tools dating mostly to the Middle Stone Age have been identified as surface material. • 7.3.1.1 – 7.3.1.7 Burial sites: A total of seven burial sites were identified. All the sites are known to current land owners, although it seems as if visitation by descendants is very limited. • 7.3.2.1 Farmstead: A single farmstead was identified that is older than sixty years. It is built in a style that is commonly referred to as Karoo style. It is abandoned and is falling apart. • 7.3.2.2 Old mine where asbestos was mined – probably Crocidolite, as it is very distinctive blue in colour and is visible in the spoil heaps at the processing plant. The site was probably abandoned during the early 1960s. <p><u>Impact assessment and proposed mitigation measures</u> Impact analysis of cultural heritage resources under threat of the proposed prospecting activities is based on the present understanding of the project:</p>	<p>X</p>	<p>Pages: 56-59,77-79, 95-96, 102-103, 106, 126-127, 147, 161-162</p>

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.1.1	Archaeological resources	Section 35	Generally protected 4C: Low significance - Requires no further recording before destruction.	Low (14) Low (14)
Mitigation: (5) No further action required				
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.1.1 – 7.3.1.7	Graves, Cemeteries and Burial Grounds	Section 36	Generally protected 4A: High / Medium significance	Medium (36) Low (16)
Mitigation: (1) Avoidance/Preserve: A minimum buffer of 100m must be established around the burial sites for the duration of the prospecting/mining phase.				
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.2.1	Structures older than 60 years	Section 34	Generally protected 4B: Medium significance	Low (20) Low (12)
Mitigation: (2) Archaeological investigation: This option should be implemented when it is impossible to avoid impacting on an identified site or feature.				
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.2.2	Structures older than 60 years	Section 34	Generally protected 4B: Medium significance	Low (20) Low (12)
Mitigation: (2) Archaeological investigation: This option should be implemented when it is impossible to avoid impacting on an identified site or feature.				
Legal requirements				
<ul style="list-style-type: none"> The legal requirements related to heritage specifically are specified in Section 3 of this report. For this proposed project, the assessment has determined that sites, features or objects of heritage significance occur in the project area, therefore various permits, depending on the type of site to be impacted on would be required. If heritage features are identified during prospecting activities, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits. 				
Reasoned opinion as to whether the proposed activity should be authorised:				
<ul style="list-style-type: none"> From a heritage point of view, it is recommended that the proposed prospecting activities be allowed to continue on acceptance of the proposed mitigation measures and the conditions proposed below. 				
Conditions for inclusion in the environmental authorisation:				

	<ul style="list-style-type: none"> • The Palaeontological Sensitivity Map (https://sahris.sahra.org.za/map/palaeo) indicate that the project area has a rather complex geological make-up, with large sections either having a moderate or high possibility of fossil remains to be found and therefore it is recommended that a desktop palaeontological assessment should be done. • Should archaeological sites or graves be exposed during prospecting work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. 		
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According to the DEA Screening Report, nine (9) specialist assessments have been identified for inclusion in the assessment report. Please see the table below for the list of these studies and also our response. Please refer to **Appendix 7**.

Specialist study according to DEA Screening tool		Response
Biodiversity study	Animal Species Assessment	<p>According to the DEA Screening Tool the Agriculture Theme Sensitivity of the proposed area is mostly Low with one central pivot irrigation system shown as high. The land capability falls within Land capability Class 7 and 8. The area is mostly used for livestock grazing and there is one central pivot irrigation system on one of the proposed portions.</p> <p>According to the Prospecting Work Programme (PWP) prospecting activities include 90 pits (3m x 2m x 4m) and 45 trenches (40m x 40m x 3m). The whole application area is 5474.2388 hectares, the area to be disturbed by pitting and trenching will be ± 7.26 Ha. Concurrent backfilling will take place in order to rehabilitate which means only 0.44ha will be disturbed at any given time. Mitigation measures as in the EMPr will be implemented.</p> <p>An Ecological and Wetland Impact Assessment was conducted, and the findings included in the EIR&EMPr</p>
	Aquatic Biodiversity Impact Assessment	
	Plant Species Assessment	
	Terrestrial Biodiversity Impact Assessment	
Archaeological and Cultural Heritage Impact Assessment		Specialist study was conducted and findings included in the EIR&EMPr.
Palaeontology Impact Assessment		
Noise Impact Assessment		We do not see the need for this study as noise is limited to working hours.
Radioactivity Impact Assessment		This study is not necessary since the process of mining Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) 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 Prospecting Work Programme (PWP) prospecting activities include 90 pits (3m x 3m x 4m) and 45 trenches (40m x 40m x 3m). The whole application area is 5474.2388 hectares, the area to be disturbed by pitting and trenching will be ± 7.281 Ha. Concurrent backfilling will take place in order to rehabilitate which means only 0.44ha will be disturbed at any given time. Mitigation measures as in the EMPr will be implemented.

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

- **Plant Species theme sensitivity:** Low and medium
- **Agriculture Theme Sensitivity:** mostly in low sensitivity with small patches in medium and very high sensitivity.
- **Aquatic Biodiversity Theme Sensitivity:** low and very high
- **Terrestrial Biodiversity Theme Sensitivity:** low and very high
- **Animal Species Theme Sensitivity:** mostly fall within medium sensitivity and a very small area within high and low sensitivity

According to the Ecological and Wetland Impact Assessment Report the following impacts can be expected. Also, the proposed prospecting operations can be considered from an ecological conservation point of view if an effective management plan is implemented to ensure that all mitigation measures discussed in the report are adhered to (**Appendix 12**):

Potential Impacts		
<i>The prospecting activities will result in a disturbance of the wetland systems and vegetation habitats during the construction and operation phases. During rainfall events, the wetland and riparian areas will receive an influx of sediment and other nutrients and possible toxic pollutants. See Table 16 below for a list of expected impacts.</i>		
Table 3: Summary of potential impacts		
Construction Phase	Operational Phase	Decommissioning Phase
<i>Alteration of the flow regime of the watercourse</i>	<i>Alteration of the flow regime of the watercourse</i>	<i>Alteration of the flow regime of the watercourse</i>
<i>Loss and disturbance of watercourse habitat and fringe vegetation</i>	<i>Loss and disturbance of watercourse habitat and fringe vegetation</i>	<i>Loss of terrestrial habitat</i>
<i>Alteration of the amount of sediment entering the water resource and associated change in turbidity</i>	<i>Alteration of the amount of sediment entering the water resource and associated change in turbidity</i>	<i>Changing the physical structure within a water resource (habitat)</i>
<i>Alteration of water quality</i>	<i>Alteration of water quality</i>	<i>Introduction and spread of alien vegetation</i>
<i>Loss of terrestrial habitat</i>	<i>Loss of terrestrial habitat</i>	
<i>Loss of Aquatic Biota</i>	<i>Loss of Aquatic Biota</i>	
<i>Loss of Terrestrial Fauna</i>	<i>Loss of Terrestrial Fauna</i>	
<i>Loss of Terrestrial Flora</i>	<i>Loss of Terrestrial Flora</i>	
<i>Introduction and spread of alien vegetation</i>	<i>Introduction and spread of alien vegetation</i>	
NEMA Impact assessment		<i>Most of the impacts associated with the prospecting activities range from High to Medium-Low prior to mitigation taking place. With mitigation fully implemented, the significance of most impacts can be reduced to Medium-High to Very-Low</i>

DWS Risk assessment	<i>All the impacts associated with the prospecting activities are ranked as Low to High, with most impacts presenting Medium ranking</i>
Mitigation Measures	<i>Refer to Section 6.5</i>

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. Therefore, the proposed prospecting operations can be considered from an ecological conservation point of view. During the construction, operational and decommissioning phases all recommendations made and concerns raised in this document should be taken into consideration. A good closure and rehabilitation plan should be in place to rehabilitate the habitat for faunal and floral species and active alien and invasive vegetation removal and monitoring should take place in accordance with an Alien Invasive Vegetation Management Plan

- Potential impact on palaeontological, heritage and cultural resources:

The Phase 1 Cultural Heritage Impact Assessment (Appendix 12) states the following:

From a heritage point of view, it is recommended that the proposed prospecting activities be allowed to continue on acceptance of the proposed mitigation measures and the conditions proposed below.

The Palaeontological Desktop Assessment (Appendix 12) states the following:

Low Palaeontological Significance has been allocated to the proposed Prospecting Right Application. It is therefore considered that the proposed development is believed to be appropriate and will not lead to detrimental impacts on the palaeontological reserves of the area.

- Potential impacts on land use:

According to **Figure 20** and **Figure 21** the proposed area is mostly covered in natural vegetation and a small area is used for cultivation. The proposed area also borders the Orange river.

- 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 mining of Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) 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.

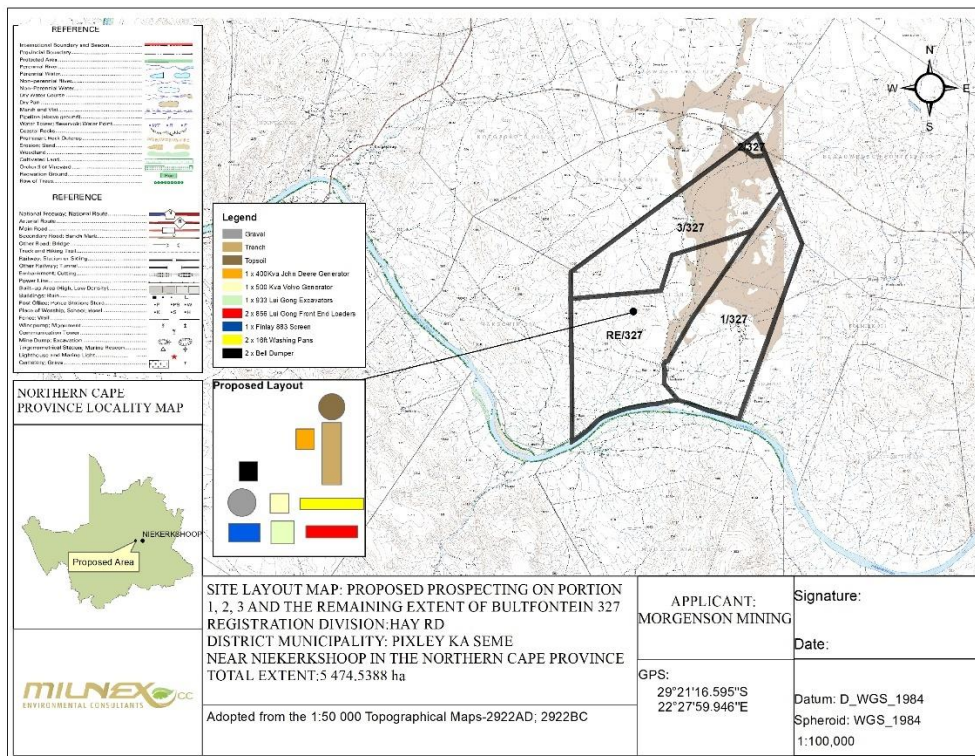


Figure 22: Site Plan

Refer to Site layout Map attached in Appendix 4.

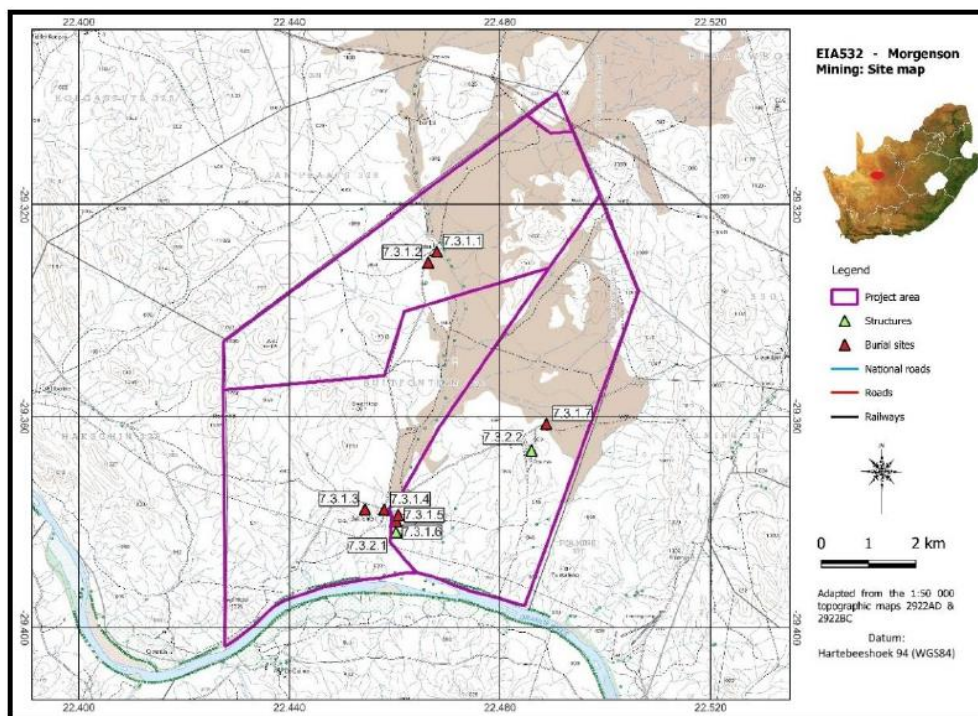


Figure 23: Identified site in the Phase 1 Cultural Heritage Impact Assessment (Appendix 12)

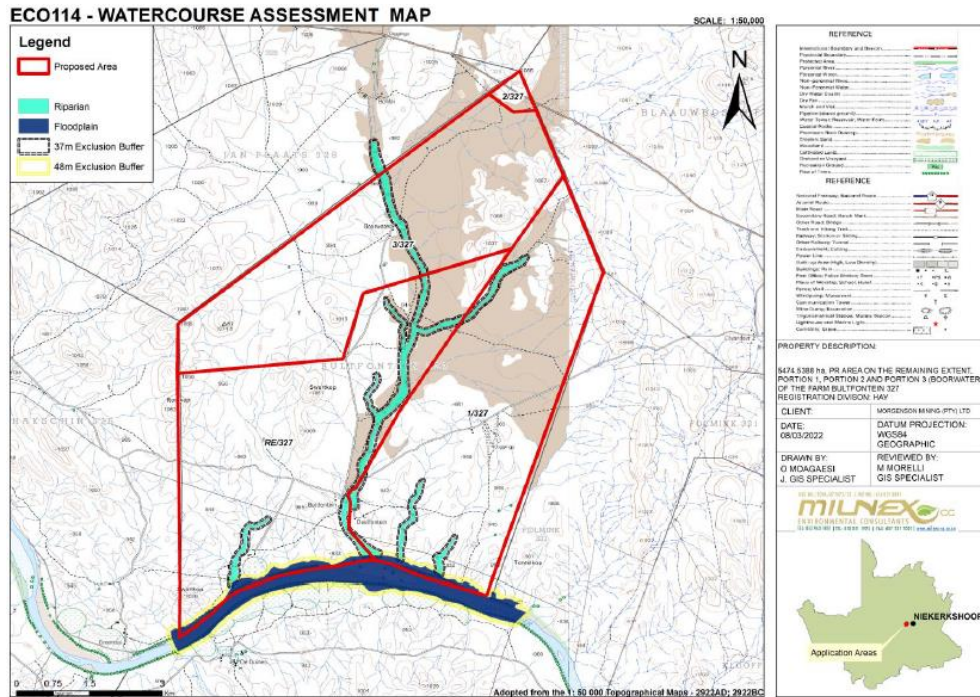


Figure 24: Watercourse Assessment and Delineation of the resources associated with the study site (Appendix 12).

(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 Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) being prospected in the Northern 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 Diamonds Alluvial, Diamonds General, Diamonds in Kimberlite, Diamonds, Stone Aggregate: Gravel 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 on the Remaining Extent, Portion 1, Portion 2 and Portion 3 (Boorwater) of the farm Bultfontein 327, Registration Division: Hay, Northern Cape Province is preferred due to the sites possible underlying Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK). 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 provide 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. There are also various alluvial diamond operations within the vicinity of the exploration area.

No other properties have been secured by the applicant and the site is therefore regarded as the preferred site, and alternatives are not considered.

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:

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

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

I, Lizanne Esterhuizen, 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:

25/03/2022

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 (REAL RATES)

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

Ref No.: **NC30/5/11/1/2/12990PR**
Date: **21/01/2022**

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and power lines)	m3	200	17,4	1	1	3480
2 (A)	Demolition of steel buildings and structures	m2	0	238,71	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	351,79	1	1	0
3	Rehabilitation of access roads	m2	200	42,72	1	1	8544
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	414,61	1	1	0
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14	2 to 3 years of maintenance and aftercare	ha	0,72	17589,34	1	1	12664,3248
15 (A)	Specialist study	Sum	0	0	1	1	0
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Sub Total 1							155943,0163

1	Preliminary and General	18713,16196	weighting factor 2	18713,16196
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2	Contingencies	15594,30163		15594,30163
Subtotal 2				190250,48
VAT (15%)				28537,57
Grand Total				218788

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.

Since concurrent backfilling will take place in order to rehabilitate, the total area to be disturbed per year will be less than the above calculation. Because of the aforementioned the total area to be disturbed is divided by two. Following the aforementioned sequence will ensure that the maximum area to be disturbed by prospecting activities at any given time, is only approximately **0.44ha**

Calculations

PITTING: 24 months (months 7 – 30)	
90 pits / 2 years =	45 pits per year
45 pits x (3m x 3m) / 10 000 =	0.04 Ha disturbed per year
TRENCHES: 24 months (31 - 54 months)	
45 trenches / 2 years =	22.5 trenches per year
Concurrent backfilling will take place in order to rehabilitate trenches:	
The area to be disturbed for 1 trench	1 trench x (40m x 40m) / 10 000 = 0.16ha
3 trenches will be worked on at any given time:	0.16ha x 2 trenches = 0.32ha
<ul style="list-style-type: none"> • 2 trenches will be open to remove gravel • 1 trench will be backfilled and rehabilitated 	0.16ha / 2 = 0.08ha
The area to be disturbed at any given time	0.32ha + 0.08ha = 0.4ha
After the trench is backfilled and rehabilitated only then will another trench be opened.	
Total	0.04ha + 0.4ha = 0.44ha

A. Explain how the aforesaid amount was derived.

The closure cost estimate provided above is aligned with the Guideline Document for the Evaluation of Quantum of Closure related Financial Provision Provided by a Mine, by the DMR (January, 2005). 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

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

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 alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix 2.19.1 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12. herein).

The prospecting Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) prospecting may impact directly on any socio-economic aspects. Indirect socio-economic benefits are expected to be associated with the creation of employment.

According to **Figure 20 and Figure 21** the proposed area is mostly covered in natural vegetation and a small area is used for cultivation. The proposed area also borders the Orange river.

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

Cultural and heritage aspects

Please see the finding of the Phase 1 Cultural Heritage Impact Assessment below:

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of Stone Age and a much later colonial (farmer) component, which eventually also gave rise to an industrial (mining) component which manifest in a number of sites spread across the larger landscape.

Identified sites

During the survey, the following sites, features or objects of cultural significance were identified.

- *7.1.1 Change finds: A very low number of stone tools dating mostly to the Middle Stone Age have been identified as surface material.*
- *7.3.1.1 – 7.3.1.7 Burial sites: A total of seven burial sites were identified. All the sites are known to current land owners, although it seems as if visitation by descendants is very limited.*
- *7.3.2.1 Farmstead: A single farmstead was identified that is older than sixty years. It is built in a style that is commonly referred to as Karoo style. It is abandoned and is falling apart.*
- *7.3.2.2 Old mine where asbestos was mined – probably Crocidolite, as it is very distinctive blue in colour and is visible in the spoil heaps at the processing plant. The site was probably abandoned during the early 1960s.*

Impact assessment and proposed mitigation measures

Impact analysis of cultural heritage resources under threat of the proposed prospecting activities is based on the present understanding of the project:

Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.1.1	Archaeological resources	Section 35	Generally protected 4C: Low significance - Requires no further recording before destruction.	Low (14)
Mitigation: (5) No further action required				
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.1.1 – 7.3.1.7	Graves, Cemeteries and Burial Grounds	Section 36	Generally protected 4A: High / Medium significance	Medium (36)
				Low (16)

Mitigation: (1) Avoidance/Preserve: A minimum buffer of 100m must be established around the burial sites for the duration of the prospecting/mining phase.				
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.2.1	Structures older than 60 years	Section 34	Generally protected 4B: Medium significance	Low (20) Low (12)
Mitigation: (2) Archaeological investigation: This option should be implemented when it is impossible to avoid impacting on an identified site or feature.				
Site No.	Site type	NHRA category	Field rating	Impact rating: Before/After mitigation
7.3.2.2	Structures older than 60 years	Section 34	Generally protected 4B: Medium significance	Low (20) Low (12)
Mitigation: (2) Archaeological investigation: This option should be implemented when it is impossible to avoid impacting on an identified site or feature.				

Reasoned opinion as to whether the proposed activity should be authorised:

- From a heritage point of view, it is recommended that the proposed prospecting activities be allowed to continue on acceptance of the proposed mitigation measures and the conditions proposed below.

Please see the findings and recommendations of the Palaeontological Desktop Assessment below:

The proposed Diamond Prospecting Right Application near Prieska is underlain by Quaternary deposits, Tertiary calcretes and the Ghaap Group (Transvaal Supergroup, Griqualand West Basin). According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Palaeontological Sensitivity of the Quaternary sediments is Low, that of the Tertiary Calcrete is High, while the Palaeontological Sensitivity of the Ghaap Group is Moderate (Almond and Pether 2008, SAHRIS website). A Low Palaeontological Significance has been allocated to the proposed Prospecting Right Application. It is therefore considered that the proposed development is believed to be appropriate and will not lead to detrimental impacts on the palaeontological reserves of the area.

If Palaeontological Heritage is uncovered during surface clearing and excavations the Chance find Protocol attached should be implemented immediately

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.

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.*
- *In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.*
- *Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.*

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, Portion 1, Portion 2 and Portion 3 (Boorwater) of the farm Bultfontein 327, Registration Division: Hay, Northern Cape Province is preferred due to the sites underlying geology and the possible diamond bearing gravel 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 possible 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
Ms. Percy Sehaole Pr.Sci.Nat	Master’s Degree in Environmental Science (refer to Appendix 1)	Tel No.: (018) 011 1925 Fax No. : (053) 963 2009 e-mail address: percy@milnex-sa.co.za
Mr. 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

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 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).

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:

- Conducting surface profiling, with associated material movement optimisation, to obtain a landscape resembling the natural landscapes to support the succession trajectory towards a climax ecological system.
- Establishing woody patches and create “rough and loose” areas for pioneer specie establishment around the respective patches.

- Establishing pioneer species as follows:
- Collected and prepared seeds for broad casting;
- Seedlings grown on on-site nursery;
- Cuttings collected from surrounding veld areas;
- Conducting rehabilitation monitoring and corrective action as required.

8. Biodiversity

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

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

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 (REAL RATES)

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

Ref No.: **NC30/5/1/1/2/12990PR**
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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.

Since concurrent backfilling will take place in order to rehabilitate, the total area to be disturbed per year will be less than the above calculation. Because of the aforementioned the total area to be disturbed is divided by two. Following the aforementioned sequence will ensure that the maximum area to be disturbed by prospecting activities at any given time, is only approximately **0.44ha**

Calculations

PITTING: 24 months (months 7 – 30)	
90 pits / 2 years =	45 pits per year
45 pits x (3m x 3m) / 10 000 =	0.04 Ha disturbed per year
TRENCHES: 24 months (31 - 54 months)	
45 trenches / 2 years =	22.5 trenches per year
Concurrent backfilling will take place in order to rehabilitate trenches:	
The area to be disturbed for 1 trench	1 trench x (40m x 40m) / 10 000 = 0.16ha
3 trenches will be worked on at any given time:	
• 2 trenches will be open to remove gravel	0.16ha x 2 trenches = 0.32ha
• 1 trench will be backfilled and rehabilitated	0.16ha / 2 = 0.08ha
The area to be disturbed at any given time	0.32ha + 0.08ha = 0.4ha
After the trench is backfilled and rehabilitated only then will another trench be opened.	
Total	0.04ha + 0.4ha = 0.44ha

- 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 m ²)	MITIGATION MEASURES (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity Or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Clearance of vegetation	Pitting and trenching phase-(construction and operation phase)	5474.2388 Ha - 90 pits (3m x 3m x 4m), 45 trenches (40m x 40m x 3m). Concurrent backfilling will take place in order to rehabilitate.	<ol style="list-style-type: none"> 1. Site clearing must take place in a phased manner, as and when required. 2. Areas which are not to be prospected 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	<ol style="list-style-type: none"> 1. Planning of access routes to the site for construction/prospecting purposes shall be done in conjunction with the Contractor and the Landowner. All agreements reached should be documented and no verbal agreements should be made. The Contractor shall clearly mark all access roads. Roads not to be used shall be marked with a "NO ENTRY for prospecting vehicles" sign. 2. Construction routes and required access roads must be clearly defined. 	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the prospecting activities.

			<ol style="list-style-type: none"> 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. 		
Prospecting Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) – Soils and geology	Pitting and trenching phase (construction and operation phase)	<p>5474.2388 Ha - 90 pits (3m x 3m x 4m), 45 trenches (40m x 40m x 3m).</p> <p>Concurrent backfilling will take place in order to rehabilitate.</p>	<ol style="list-style-type: none"> 1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil (If topsoil exists), and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected 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), Diamonds General (D) and Diamonds in Kimberlite (DK) – excavations	Pitting and trenching phase (construction and operation phase)	5474.2388 Ha - 90 pits (3m x 3m x 4m), 45 trenches (40m x 40m x 3m). Concurrent backfilling will take place in order to rehabilitate.	<ol style="list-style-type: none"> 1. The prospecting activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development. 2. Mine, pans, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants. 12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine. 	Compliance with Duty of Care as detailed within NEMA	Duration of operations on the prospecting area

Ecological and Wetland Impact Assessment Report (Appendix 12)

Mitigation Measures

Impact	Source of Impact	Recommended Mitigation Measures
<p>Alteration of the flow regime of the watercourse</p>	<p>Construction:</p> <ul style="list-style-type: none"> • Infrastructure development within watercourses • Removal and disturbance of watercourse habitat and vegetation • Habitat fragmentation • Impoundments within the watercourse • Lack of adequate rehabilitation resulting in colonization by invasive plants <p>Operational:</p> <ul style="list-style-type: none"> • Excavation from the watercourses • Clearing of vegetation • Vehicles driving in and through watercourses <p>Decommissioning:</p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Any activities that take place within 50 meters of a wetland or watercourse or the 1:100 year flood lines will require authorisation in terms of the relevant regulations of NEMA, however as far as possible infrastructure should be placed outside the recommended buffer lines. • Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas. • Where construction occurs in the demarcated watercourse and buffer areas, additional precautions should be implemented to minimise watercourse loss. • No stockpiling should take place within a watercourse or the calculated buffers. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed stream banks. • 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. • Monitor the occurrence of erosion during the rainy season and take immediate corrective action where needed. • A sensitivity map has been developed for the study area, indicating the wetland systems, and their relevant buffer zones. It is recommended that this sensitivity map be considered during all phases of the development and with special mentioning of the planning of infrastructure, in order to aid in the conservation of and minimise impact on the wetland and aquatic habitat and resources within the study site. • Any areas where bank failure is observed, due to the prospecting impacts, should be immediately repaired. • 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. • Operational phase activities should not take place within watercourses or buffer zones. • The duration of impacts on the wetlands should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. • All rehabilitation activities should occur in the dry season. • Rehabilitation of disturbed areas as a result of construction must be implemented immediately upon completion of construction.

<p>Changing the physical structure within a water resource (habitat)</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Infrastructure development within watercourses • Loss of vegetation • Flow alteration • Erosion <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Excavation from the watercourses leading to degraded river channels. • Removal of substrate within wetlands • Clearing of vegetation – vegetation loss • Loss of biodiversity • Alteration and/or loss of hydrological flow classes • Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Other than approved and authorized structures, no other development or maintenance infrastructure is allowed within the delineated watercourse and riparian areas or their associated buffer zones. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. • Monitor the occurrence of erosion during the rainy season and take immediate corrective action where needed. • No stockpiling should take place within a watercourse or the calculated buffers. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • All maintenance within watercourses 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 flow alteration and sedimentation will take place is minimised. • Rehabilitation must ensure that wetland structure and function are reinstated in such a way as to ensure the ongoing functionality of the systems at pre-prospecting levels. • All rehabilitation activities should occur in the dry season.
<p>Alteration of the amount of sediment entering the water resource and associated change in turbidity</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Vegetation clearance causing sedimentation • Earthworks activities • Disturbance of soil surface and runoff characteristics • Erosion <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Excavation from the watercourses leading to degraded river channels. • Removal of substrate within wetlands • Clearing of vegetation – vegetation loss • Loss of biodiversity • Alteration and/or loss of hydrological flow classes • Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Buffer zones should be maintained, in order to minimise sedimentation of the downstream areas. • No stockpiling should take place within a watercourse or the calculated buffers. • Ensure that erosion management and sediment controls are strictly implemented from the beginning of site clearing activities. • All areas should be re-sloped and top-soiled where necessary and reseeded with indigenous grasses to stabilise the loose material. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed stream banks. • As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. • Erosion control measures, such as berms, must be implemented to manage runoff from roads to prevent erosion and pollution. • Rehabilitation of disturbed areas as a result of construction must be implemented immediately upon completion of construction. • Rehabilitation must ensure that riparian structure and function are reinstated in such a way as to ensure the ongoing functionality of the larger riparian systems at pre-prospecting levels. • All rehabilitation activities should occur in the dry season. • The duration of impacts on the riverine systems should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. • Maintain flood capacity, particularly in areas with significant flood hazards.

<p>Alteration of water quality</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Runoff from road surfaces • Discharge of sewage • Discharge of solvents, chemicals and hydrocarbons <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Maintenance of vehicles and machinery • Runoff from road surfaces • Discharge of sewage • Discharge of solvents, chemicals and hydrocarbons • Excavation from the watercourses and the release of nutrients and pollutants from disturbed soils • Removal of substrate within wetlands <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Re-fuelling must take place on a sealed surface area to prevent hydrocarbon pollution. • All spills should be cleaned up immediately and disposed of. • Spill kits should be readily available and easily accessible throughout the site. • All chemicals must be stored safely on site, outside the buffer areas and surrounded by bunds. Chemical storage containers must be regularly inspected for early leak detection. • Littering must be prevented by effective site management and the provision of bins. • Provision of adequate sanitation facilities located outside of the delineated buffer zones. • An emergency spill procedure should be developed and implemented. • No stockpiling should take place within a watercourse. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Stockpiles must be located away from channels, wetlands and drainage lines. • Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed riverbanks.
<p>Loss of terrestrial habitat</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Clearing of vegetation – vegetation loss <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Removal of substrate within watercourses • Clearing of vegetation during prospecting operations <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Areas that are stripped during construction and operation should be re-vegetated with indigenous vegetation. • It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined project area) and preventing movement of workers into natural areas. • The duration of the prospecting should be minimized to as short term as possible, in order to reduce the period of disturbance on fauna and flora. • Areas of indigenous vegetation should under no circumstances be fragmented or disturbed for used as an area for dumping of waste. • As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. • All staff and visitors to the site must undergo an induction process and must be made aware of the sensitive nature of the environment and floral species which occur there. • The area must be re-vegetated with plant and grass species which are endemic to the exact vegetation types. • Rehabilitation measures that are implemented must be continually monitored to ensure that proper succession has occurred and that there is no erosion occurring. • An alien invasive vegetation management plan should be developed and implemented. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat.
<p>Loss of Aquatic Biota</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Runoff from road surfaces • Sedimentation 	<ul style="list-style-type: none"> • Biomonitoring of aquatic macro-invertebrates within the riverine systems is essential.

	<ul style="list-style-type: none"> Discharge of solvents, chemicals and hydrocarbons <p>Operational:</p> <ul style="list-style-type: none"> Maintenance of vehicles and machinery Runoff from road surfaces Discharge of solvents, chemicals and hydrocarbons Excavation from the watercourses and the release of nutrients and pollutants from disturbed soils Removal of substrate within wetlands Sedimentation 	
Loss of Terrestrial Fauna	<p>Construction and Operational:</p> <ul style="list-style-type: none"> Vegetation loss and disturbance – clearing of vegetation Excessive noise disturbances Illegal hunting Habitat fragmentation destruction Vehicles driving through natural vegetated areas 	<ul style="list-style-type: none"> Site clearing to take place in a phased manner (where possible) to allow for any faunal species present to move away from the study site to the surrounding open space areas. Prior and during vegetation clearance any larger fauna species noted should be given the opportunity to move away from the construction machinery. Fauna species such as frogs and reptiles that have not moved away should be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO trained in the handling and relocation of animals. Fencing should be erected around the project area to prevent workers and members of the public from entering the surrounding environments. This fence should have small openings to allow wildlife to pass through. Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. Should any sensitive or Red Data animal or bird species be encountered during the construction, operation and decommissioning activities, these should be relocated to natural areas in the vicinity. Any sensitive fauna that are inadvertently killed during earthmoving operations should be preserved as museum voucher specimens. No hunting, trapping or killing of fauna are allowed. Any lizards, snakes or monitors encountered should be allowed to escape to a suitable habitat away from disturbance. General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area. Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.
Loss of Terrestrial Flora	<p>Construction and Operational:</p> <ul style="list-style-type: none"> Vegetation clearance Vehicles driving through natural vegetated areas Habitat fragmentation and destruction 	<ul style="list-style-type: none"> Areas that are stripped during construction and operation should be re-vegetated with indigenous vegetation as soon as possible. This will also reduce the likelihood of encroachment by alien invasive plant species. Protected trees and plants shall not be removed or damaged without prior approval, permits or licenses from the relevant authority. This is especially applicable to the Protected Camel Thorn (<i>Vachellia erioloba</i>) and Sheperd's tree (<i>Boscia albitrunca</i>) which were present on site.

<p>Introduction and spread of alien vegetation</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Clearing of vegetation <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Removal of substrate within watercourses • Clearing of vegetation during prospecting operations • Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Proliferation of alien and invasive species is expected within any disturbed areas particularly as there are some alien and invasive species present within the study site. These species should be eradicated and controlled to prevent further spread beyond. • An alien invasive vegetation management plan should be developed and implemented. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. • 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.
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IMPACT MANAGEMENT OUTCOMES

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

ACTIVITY (whether listed or not listed). (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. • 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 <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> 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. 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. 	Minimisation of impacts to acceptable limits

				<p>9. Rehabilitation process must make use of species indigenous to the area. Seeds from surrounding seed banks can be used for re-seeding.</p> <p>10. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.</p> <p>11. Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged.</p> <p>Demarcation of prospecting area</p> <p>12. All plants not interfering with prospecting operations shall be left undisturbed clearly marked and indicated on the site plan.</p> <p>13. The prospecting area must be well demarcated and no construction/prospecting activities must be allowed outside of this demarcated footprint.</p> <p>14. Vegetation removal must be phased in order to reduce impact of construction/prospecting.</p> <p>15. Site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.</p> <p>16. Strict and regular auditing of the prospecting process to ensure containment of the prospecting and laydown areas.</p> <p>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.</p> <p>Utilisation of resources</p> <p>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.</p> <p>Exotic vegetation</p> <p>19. Alien vegetation on the site will need to be controlled.</p> <p>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.</p> <p>21. The spread of exotic species occurring throughout the site should be controlled.</p>	
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				<p>Herbicides</p> <p>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.</p> <p>23. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation.</p> <p>Fauna</p> <p>24. Rehabilitation to be undertaken as soon as possible after the prospecting activities have been completed.</p> <p>25. No trapping or snaring to fauna on the construction/prospecting site should be allowed.</p> <p>26. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development.</p>	
Prospecting of Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) – excavations	Loss of topsoil	Soil	Pitting and trenching phase (construction and operation phase)	<ol style="list-style-type: none"> 1. The Contractor should, prior to the commencement of earthworks determine the average depth of topsoil, and agree on this with the ECO. The full depth of topsoil should be stripped from areas affected by construction and related activities prior to the commencement of major earthworks. This should include the building footprints, working areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas. 2. Care must be taken not to mix topsoil and subsoil 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

				<p>6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding.</p> <p>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.</p> <p>Establish an effective record keeping system for each area where soil is disturbed for prospecting purposes. These records should be included in environmental performance reports, and should include all the records below.</p> <ul style="list-style-type: none"> • Record the GPS coordinates of each area. • Record the date of topsoil stripping. • Record the GPS coordinates of where the topsoil is stockpiled. • Record the date of cessation prospecting activities at the particular site. • Photograph the area on cessation of prospecting activities. • Record date and depth of re-spreading of topsoil. • Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time. 	
	Erosion	Soil Air Water	Pitting and trenching phase (construction and operation phase)	<ol style="list-style-type: none"> 1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream. 3. 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: 	Minimisation of impacts to acceptable limits

				<ul style="list-style-type: none"> ○ Brush packing with cleared vegetation ○ Mulch or chip packing ○ Planting of vegetation ○ Hydroseeding/hand sowing <p>6. Sensitive areas need to be identified prior to construction/prospecting so that the necessary precautions can be implemented.</p> <p>7. All erosion control mechanisms need to be regularly maintained.</p> <p>8. Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces.</p> <p>9. Retention of vegetation where possible to avoid soil erosion.</p> <p>10. Vegetation clearance should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.</p> <p>11. Re-vegetation of disturbed surfaces should occur immediately after construction/prospecting activities are completed. This should be done through seeding with indigenous grasses.</p> <p>12. No impediment to the natural water flow other than approved erosion control works is permitted.</p> <p>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.</p> <p>14. Stockpiles not used in three (3) months after stripping must be seeded or backfilled to prevent dust and erosion.</p>	
	Air Pollution	Air	Pitting and trenching phase (construction and operation phase)	<p>Dust control</p> <ol style="list-style-type: none"> 1) Wheel washing and damping down of un-surfaced and un-vegetated areas. 2) Retention of vegetation where possible will reduce dust travel. 3) Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas. 4) Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust. 5) The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities. 	Minimisation of impacts to acceptable limits

				<p>6) A speed limit of 30km/h must not be exceeded on site.</p> <p>7) Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor.</p> <p>8) Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled.</p> <p>Odour control</p> <p>9) Regular servicing of vehicles in order to limit gaseous emissions.</p> <p>10) Regular servicing of onsite toilets to avoid potential odours.</p> <p>Rehabilitation</p> <p>11) The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks.</p> <p>Fire prevention</p> <p>12) No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.</p> <p>13) The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.</p>	
	Noise		Pitting and trenching phase (construction and operation phase)	<p>1. The prospecting activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development.</p> <p>2. 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.</p> <p>3. Truck traffic should be routed away from noise sensitive areas, where possible.</p> <p>4. Noise levels must be kept within acceptable limits.</p> <p>5. Noisy operations should be combined so that they occur where possible at the same time.</p>	Minimisation of impacts to acceptable limits

				<ol style="list-style-type: none"> 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants. 12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise emission levels very often is a sign of the imminent mechanical failure of a machine. 	
	Impact on potential cultural and heritage artefacts	Heritage	Pitting and trenching phase (construction and operation phase)	<ol style="list-style-type: none"> 1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA. 2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. 3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken. 4. Known sites should be clearly marked in order that they can be avoided. The work force should also be informed that fenced-off areas are no-go areas. 5. The ECO must also survey for heritage and palaeontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development. 6. All digging, excavating, drilling or blasting activities must be stopped if heritage and/or palaeontological artefacts are 	Minimisation of impacts to acceptable limits

				<p>uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures.</p> <ol style="list-style-type: none"> 7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any heritage/palaeontology sites are to be destroyed or altered. 8. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1). 9. 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”. <p><u>Phase 1 Cultural Heritage Impact Assessment: Identified sites</u> During the survey, the following sites, features or objects of cultural significance were identified.</p> <p>7.1.1 Change finds: A very low number of stone tools dating mostly to the Middle Stone Age have been identified as surface material.</p> <p>7.3.1.1 – 7.3.1.7 Burial sites: A total of seven burial sites were identified. All the sites are known to current land owners, although it seems as if visitation by descendants is very limited.</p> <p>7.3.2.1 Farmstead: A single farmstead was identified that is older than sixty years. It is built in a style that is commonly referred to as Karoo style. It is abandoned and is falling apart.</p> <p>7.3.2.2 Old mine where asbestos was mined – probably Crocidolite, as it is very distinctive blue in colour and is visible in the spoil heaps at the processing plant. The site was probably abandoned during the early 1960s.</p> <p><u>Mitigation measures for identified sites</u></p>	
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				<p>(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.</p> <ul style="list-style-type: none"> • 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. <p>Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.</p> <ul style="list-style-type: none"> • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area. 	
Waste management		Pollution	Pitting and trenching phase (construction and operation phase)	<p>Litter management</p> <ol style="list-style-type: none"> 1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction site. 2. The Contractor shall supply waste collection bins where such is not available and all solid waste collected shall be disposed of at registered/licensed landfill. 	Minimisation of impacts to acceptable limits

				<ol style="list-style-type: none"> 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. <p>Hazardous waste</p> <ol style="list-style-type: none"> 12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant. 13. Contaminants to be stored safely to avoid spillage. 14. Machinery must be properly maintained to keep oil leaks in check. 15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction and any spills shall immediately be cleaned up and all affected areas rehabilitated. <p>Sanitation</p>	
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				<p>16. The Contractor shall install mobile chemical toilets on the site.</p> <p>17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed.</p> <p>18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly.</p> <p>19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer.</p> <p>20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility.</p> <p>21. The construction of “Long Drop” toilets is forbidden, but rather toilets connected to the sewage treatment plant.</p> <p>22. Potable water must be provided for all construction staff.</p> <p>Remedial actions</p> <p>23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site.</p> <p>24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site.</p> <p>25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil.</p> <p>26. If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent material.</p> <p>27. If necessary, oil absorbent sheets or pads must be attached to leaky machinery or infrastructure.</p> <p>28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.</p> <p>29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment, and stored in adequate containers until appropriate disposal.</p>	
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Water Use and Quality	Water pollution	Water	Pitting and trenching phase (construction and operation phase)	<p>Water Use</p> <ol style="list-style-type: none"> 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. <p>Water Quality</p> <ol style="list-style-type: none"> 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. <p>Stormwater</p> <ol style="list-style-type: none"> 6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants. 7. Silt fences should be used to prevent any soil entering the stormwater drains. 8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration. 9. Promote a water saving mind set with construction/prospecting workers in order to Contractor ensure less water wastage. 10. Hazardous substances must be stored at least 40m from any water bodies on site to avoid pollution. 11. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase. 12. Earth, stone and rubble is to be properly disposed of, or utilized on site so as not to obstruct natural water path 	
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				<p>ways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers.</p> <ol style="list-style-type: none"> 13. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed. 14. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. <p>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.</p> <p>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.</p> <p>If these practices is found to be insufficient for the control of storm water and sedimentation, other alternatives should immediately be investigated and implemented.</p> <p>Groundwater resource protection</p> <ol style="list-style-type: none"> 15. Process solution storage ponds and other impoundments designed to hold non fresh water or non-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality. 16. Prevent dirty water runoff from leaving the general mining area; 17. 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; 18. Enough supply of absorbent fibre should be kept at the site to contain accidental spills; 19. Contain dirty water in return water dams and re-use dirty water for dust suppression and make up water in the plant; 20. Proper storm water management should be implemented. Berms should also be constructed to ensure separation of clean water and dirty water areas; 	
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				<p>21. 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.</p> <p>Sanitation</p> <p>22. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers).</p> <p>23. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.</p> <p>Concrete mixing</p> <p>24. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth.</p> <p>Public areas</p> <p>25. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis.</p> <p>26. The Contractor should take steps to ensure that littering by construction/prospecting workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines.</p> <p>27. No washing or servicing of vehicles on site.</p> <p>Infrastructure</p> <p>28. 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.</p>	
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Ecological and Wetland Impact Assessment Report (Appendix 12)

Mitigation Measures

Impact	Source of Impact	Recommended Mitigation Measures
<p>Alteration of the flow regime of the watercourse</p>	<p>Construction:</p> <ul style="list-style-type: none"> • Infrastructure development within watercourses • Removal and disturbance of watercourse habitat and vegetation • Habitat fragmentation • Impoundments within the watercourse • Lack of adequate rehabilitation resulting in colonization by invasive plants <p>Operational:</p> <ul style="list-style-type: none"> • Excavation from the watercourses • Clearing of vegetation • Vehicles driving in and through watercourses <p>Decommissioning:</p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Any activities that take place within 50 meters of a wetland or watercourse or the 1:100 year flood lines will require authorisation in terms of the relevant regulations of NEMA, however as far as possible infrastructure should be placed outside the recommended buffer lines. • Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas. • Where construction occurs in the demarcated watercourse and buffer areas, additional precautions should be implemented to minimise watercourse loss. • No stockpiling should take place within a watercourse or the calculated buffers. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed stream banks. • 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. • Monitor the occurrence of erosion during the rainy season and take immediate corrective action where needed. • A sensitivity map has been developed for the study area, indicating the wetland systems, and their relevant buffer zones. It is recommended that this sensitivity map be considered during all phases of the development and with special mentioning of the planning of infrastructure, in order to aid in the conservation of and minimise impact on the wetland and aquatic habitat and resources within the study site. • Any areas where bank failure is observed, due to the prospecting impacts, should be immediately repaired. • 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. • Operational phase activities should not take place within watercourses or buffer zones. • The duration of impacts on the wetlands should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. • All rehabilitation activities should occur in the dry season. • Rehabilitation of disturbed areas as a result of construction must be implemented immediately upon completion of construction.

<p>Changing the physical structure within a water resource (habitat)</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Infrastructure development within watercourses • Loss of vegetation • Flow alteration • Erosion <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Excavation from the watercourses leading to degraded river channels. • Removal of substrate within wetlands • Clearing of vegetation – vegetation loss • Loss of biodiversity • Alteration and/or loss of hydrological flow classes • Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Other than approved and authorized structures, no other development or maintenance infrastructure is allowed within the delineated watercourse and riparian areas or their associated buffer zones. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. • Monitor the occurrence of erosion during the rainy season and take immediate corrective action where needed. • No stockpiling should take place within a watercourse or the calculated buffers. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • All maintenance within watercourses 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 flow alteration and sedimentation will take place is minimised. • Rehabilitation must ensure that wetland structure and function are reinstated in such a way as to ensure the ongoing functionality of the systems at pre-prospecting levels. • All rehabilitation activities should occur in the dry season.
<p>Alteration of the amount of sediment entering the water resource and associated change in turbidity</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Vegetation clearance causing sedimentation • Earthworks activities • Disturbance of soil surface and runoff characteristics • Erosion <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Excavation from the watercourses leading to degraded river channels. • Removal of substrate within wetlands • Clearing of vegetation – vegetation loss • Loss of biodiversity • Alteration and/or loss of hydrological flow classes • Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Buffer zones should be maintained, in order to minimise sedimentation of the downstream areas. • No stockpiling should take place within a watercourse or the calculated buffers. • Ensure that erosion management and sediment controls are strictly implemented from the beginning of site clearing activities. • All areas should be re-sloped and top-soiled where necessary and reseeded with indigenous grasses to stabilise the loose material. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed stream banks. • As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. • Erosion control measures, such as berms, must be implemented to manage runoff from roads to prevent erosion and pollution. • Rehabilitation of disturbed areas as a result of construction must be implemented immediately upon completion of construction. • Rehabilitation must ensure that riparian structure and function are reinstated in such a way as to ensure the ongoing functionality of the larger riparian systems at pre-prospecting levels. • All rehabilitation activities should occur in the dry season. • The duration of impacts on the riverine systems should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. • Maintain flood capacity, particularly in areas with significant flood hazards.

<p>Alteration of water quality</p>	<p>Construction:</p> <ul style="list-style-type: none"> • Runoff from road surfaces • Discharge of sewage • Discharge of solvents, chemicals and hydrocarbons <p>Operational:</p> <ul style="list-style-type: none"> • Maintenance of vehicles and machinery • Runoff from road surfaces • Discharge of sewage • Discharge of solvents, chemicals and hydrocarbons • Excavation from the watercourses and the release of nutrients and pollutants from disturbed soils • Removal of substrate within wetlands <p>Decommissioning:</p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Re-fuelling must take place on a sealed surface area to prevent hydrocarbon pollution. • All spills should be cleaned up immediately and disposed of. • Spill kits should be readily available and easily accessible throughout the site. • All chemicals must be stored safely on site, outside the buffer areas and surrounded by bunds. Chemical storage containers must be regularly inspected for early leak detection. • Littering must be prevented by effective site management and the provision of bins. • Provision of adequate sanitation facilities located outside of the delineated buffer zones. • An emergency spill procedure should be developed and implemented. • No stockpiling should take place within a watercourse. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Stockpiles must be located away from channels, wetlands and drainage lines. • Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed riverbanks.
<p>Loss of terrestrial habitat</p>	<p>Construction:</p> <ul style="list-style-type: none"> • Clearing of vegetation – vegetation loss <p>Operational:</p> <ul style="list-style-type: none"> • Removal of substrate within watercourses • Clearing of vegetation during prospecting operations <p>Decommissioning:</p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Areas that are stripped during construction and operation should be re-vegetated with indigenous vegetation. • It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined project area) and preventing movement of workers into natural areas. • The duration of the prospecting should be minimized to as short term as possible, in order to reduce the period of disturbance on fauna and flora. • Areas of indigenous vegetation should under no circumstances be fragmented or disturbed for used as an area for dumping of waste. • As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. • All staff and visitors to the site must undergo an induction process and must be made aware of the sensitive nature of the environment and floral species which occur there. • The area must be re-vegetated with plant and grass species which are endemic to the exact vegetation types. • Rehabilitation measures that are implemented must be continually monitored to ensure that proper succession has occurred and that there is no erosion occurring. • An alien invasive vegetation management plan should be developed and implemented. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat.
<p>Loss of Aquatic Biota</p>	<p>Construction:</p> <ul style="list-style-type: none"> • Runoff from road surfaces • Sedimentation 	<ul style="list-style-type: none"> • Biomonitoring of aquatic macro-invertebrates within the riverine systems is essential.

	<ul style="list-style-type: none"> Discharge of solvents, chemicals and hydrocarbons <p>Operational:</p> <ul style="list-style-type: none"> Maintenance of vehicles and machinery Runoff from road surfaces Discharge of solvents, chemicals and hydrocarbons Excavation from the watercourses and the release of nutrients and pollutants from disturbed soils Removal of substrate within wetlands Sedimentation 	
Loss of Terrestrial Fauna	<p>Construction and Operational:</p> <ul style="list-style-type: none"> Vegetation loss and disturbance – clearing of vegetation Excessive noise disturbances Illegal hunting Habitat fragmentation destruction Vehicles driving through natural vegetated areas 	<ul style="list-style-type: none"> Site clearing to take place in a phased manner (where possible) to allow for any faunal species present to move away from the study site to the surrounding open space areas. Prior and during vegetation clearance any larger fauna species noted should be given the opportunity to move away from the construction machinery. Fauna species such as frogs and reptiles that have not moved away should be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO trained in the handling and relocation of animals. Fencing should be erected around the project area to prevent workers and members of the public from entering the surrounding environments. This fence should have small openings to allow wildlife to pass through. Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. Should any sensitive or Red Data animal or bird species be encountered during the construction, operation and decommissioning activities, these should be relocated to natural areas in the vicinity. Any sensitive fauna that are inadvertently killed during earthmoving operations should be preserved as museum voucher specimens. No hunting, trapping or killing of fauna are allowed. Any lizards, snakes or monitors encountered should be allowed to escape to a suitable habitat away from disturbance. General avoidance of snakes is the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area. Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.
Loss of Terrestrial Flora	<p>Construction and Operational:</p> <ul style="list-style-type: none"> Vegetation clearance Vehicles driving through natural vegetated areas Habitat fragmentation and destruction 	<ul style="list-style-type: none"> Areas that are stripped during construction and operation should be re-vegetated with indigenous vegetation as soon as possible. This will also reduce the likelihood of encroachment by alien invasive plant species. Protected trees and plants shall not be removed or damaged without prior approval, permits or licenses from the relevant authority. This is especially applicable to the Protected Camel Thorn (<i>Vachellia erioloba</i>) and Sheperd's tree (<i>Boscia albitrunca</i>) which were present on site.

<p>Introduction and spread of alien vegetation</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Clearing of vegetation <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Removal of substrate within watercourses • Clearing of vegetation during prospecting operations • Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Proliferation of alien and invasive species is expected within any disturbed areas particularly as there are some alien and invasive species present within the study site. These species should be eradicated and controlled to prevent further spread beyond. • An alien invasive vegetation management plan should be developed and implemented. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. • 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.
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IMPACT MANAGEMENT ACTIONS

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

<p>ACTIVITY Whether listed or not listed.</p> <p>(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.)</p>	<p>POTENTIAL IMPACT</p> <p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)</p>	<p>MITIGATION TYPE</p> <p>(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)</p> <p>E.g.</p> <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring <p>Remedy through rehabilitation..</p>	<p>TIME PERIOD FOR IMPLEMENTATION</p> <p>Describe the time period when the measures in the environmental management programme must be implemented. Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>	<p>COMPLIANCE WITH STANDARDS</p> <p>(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)</p>
<p>Clearance of vegetation</p>	<p>Loss or fragmentation of habitats</p>	<p>Existing vegetation</p> <ol style="list-style-type: none"> 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. <p>Rehabilitation</p> <ol style="list-style-type: none"> 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. 	<p>Duration of operation</p>	<p>The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.</p>

		<ol style="list-style-type: none"> 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. <p>Demarcation of prospecting area</p> <ol style="list-style-type: none"> 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. <p>Utilisation of resources</p> <ol style="list-style-type: none"> 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. 		
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		<p>Exotic vegetation</p> <p>19. Alien vegetation on the site will need to be controlled.</p> <p>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.</p> <p>21. The spread of exotic species occurring throughout the site should be controlled.</p> <p>Herbicides</p> <p>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.</p> <p>23. The use of pesticides and herbicides on the site must be discouraged as these impact on important pollinator species of indigenous vegetation.</p> <p>Fauna</p> <p>24. Rehabilitation to be undertaken as soon as possible after prospecting has been completed.</p> <p>25. No trapping or snaring to fauna on the construction/prospecting site should be allowed.</p> <p>26. No faunal species must be disturbed, trapped, hunted or killed by maintenance staff during any routine maintenance at the development.</p>		
<p>Prospecting of Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) – excavations</p>	<p>Loss of topsoil</p>	<p>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/prospecting and related activities prior to the commencement of major earthworks. This should include the building footprints, working</p>	<p>Duration of operation</p>	<p>The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.</p>

		<p>areas and storage areas. Topsoil must be reused where possible to rehabilitate disturbed areas.</p> <ol style="list-style-type: none"> 2. Care must be taken not to mix topsoil and subsoil during stripping. 3. The topsoil must be conserved on site in and around the pit/trench area. 4. Subsoil and overburden in the prospecting area should be stockpiled separately to be returned for backfilling in the correct soil horizon order. 5. If stockpiles are exposed to windy conditions or heavy rain, they should be covered either by vegetation or geofabric, depending on the duration of the project. Stockpiles may further be protected by the construction of berms or low brick walls around their bases. 6. Stockpiles should be kept clear of weeds and alien vegetation growth by regular weeding. 7. Where contamination of soil is expected, analysis must be done prior to disposal of soil to determine the appropriate disposal route. Proof from an approved waste disposal site where contaminated soils are dumped if and when a spillage/leakage occurs should be attained and given to the project manager. <p>Establish an effective record keeping system for each area where soil is disturbed for prospecting purposes. These records should be included in environmental performance reports, and should include all the records below.</p> <ul style="list-style-type: none"> • Record the GPS coordinates of each area. <ul style="list-style-type: none"> • 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 		
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		to show vegetation establishment and evaluate progress of restoration over time.		
	Erosion	<ol style="list-style-type: none"> 1. An effective system of run-off control should be implemented, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion. 2. Periodical site inspection should be included in environmental performance reporting that inspects the effectiveness of the run-off control system and specifically records the occurrence of any erosion on site or downstream. 3. 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: <ul style="list-style-type: none"> o Brush packing with cleared vegetation o Mulch or chip packing o Planting of vegetation o Hydroseeding/hand sowing 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 	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		<p>construction/prospecting activities must be estimated and the drainage system assessed accordingly. A drainage plan must be submitted to the Engineer for approval and must include the location and design criteria of any temporary stream crossings.</p> <p>14. Stockpiles not used in three (3) months after stripping must be seeded/backfilled to prevent dust and erosion.</p>		
	<p>Air Pollution</p>	<p>Dust control</p> <ol style="list-style-type: none"> 1) Wheel washing and damping down of un-surfaced and un-vegetated areas. 2) Retention of vegetation where possible will reduce dust travel. 3) Clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas. 4) Damping down of all exposed soil surfaces with a water bowser or sprinklers when necessary to reduce dust. 5) The Contractor shall be responsible for dust control on site to ensure no nuisance is caused to the neighbouring communities. 6) A speed limit of 30km/h must not be exceeded on site. 7) Any complaints or claims emanating from the lack of dust control shall be attended to immediately by the Contractor. 8) Any dirt roads that are utilised by the workers must be regularly maintained to ensure that dust levels are controlled. <p>Odour control</p> <ol style="list-style-type: none"> 9) Regular servicing of vehicles in order to limit gaseous emissions. 10) Regular servicing of onsite toilets to avoid potential odours. <p>Rehabilitation</p> <ol style="list-style-type: none"> 11) The Contractor should commence rehabilitation of exposed soil surfaces as soon as practical after completion of earthworks. <p>Fire prevention</p>	<p>Duration of operation</p>	<p>The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.</p>

		<p>12) No open fires shall be allowed on site under any circumstance. All cooking shall be done in demarcated areas that are safe and cannot cause runaway fires.</p> <p>13) The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.</p>		
	<p>Noise</p>	<ol style="list-style-type: none"> 1. The prospecting activities must aim to adhere to the relevant noise regulations and limit noise to within standard working hours in order to reduce disturbance of dwellings in close proximity to the development. 2. Pans, power plants, crushers, workshops and other noisy fixed facilities should be located well away from noise sensitive areas. Once the proposed final layouts are made available by the Contractor(s), the sites must be evaluated in detail and specific measures designed in to the system. 3. Truck traffic should be routed away from noise sensitive areas, where possible. 4. Noise levels must be kept within acceptable limits. 5. Noisy operations should be combined so that they occur where possible at the same time. 6. Mine workers to wear necessary ear protection gear. 7. Noisy activities to take place during allocated hours. 8. Noise from labourers must be controlled. 9. Noise suppression measures must be applied to all equipment. Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. Should the vehicles or equipment not be in good working order, the Contractor may be instructed to remove the offending vehicle or machinery from the site. 10. The Contractor must take measures to discourage labourers from loitering in the area and causing noise disturbance. Where possible labour shall be transported to and from the site by the Contractor or his Sub-Contractors by the Contractors own transport. 11. Implementation of enclosure and cladding of processing plants. 12. Applying regular and thorough maintenance schedules to equipment and processes. An increase in noise 	<p>Duration of operation</p>	<p>The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.</p>

		<p>emission levels very often is a sign of the imminent mechanical failure of a machine.</p>		
	<p>Impact on potential cultural and heritage artefacts</p>	<ol style="list-style-type: none"> 1. Any finds must be reported to the nearest National Monuments office to comply with the National Heritage Resources Act (Act No 25 of 1999) and to DEA. 2. Local museums as well as the South African Heritage Resource Agency (SAHRA) should be informed if any artefacts/ fossils are uncovered in the affected area. 3. The Contractor must ensure that his workforce is aware of the necessity of reporting any possible historical, archaeological or palaeontological finds to the ECO so that appropriate action can be taken. 4. Known sites should be clearly marked in order that they can be avoided. The work force should also be informed that fenced-off areas are no-go areas. 5. The ECO must also survey for heritage and palaeontological artefacts during ground breaking and digging or drilling. He/she should familiarise themselves with formations and its fossils or a palaeontologist should be appointed during the digging and excavation phase of the development. 6. All digging, excavating, drilling or blasting activities must be stopped if heritage and/or palaeontological artefacts are uncovered and a specialist should be called in to determine proper management, mitigation, excavation and/or collecting measures. 7. Any discovered artefacts or fossils shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits shall be obtained from SAHRA should the proposed site affect any world heritage/palaeontology sites or if any heritage/palaeontology sites are to be destroyed or altered. 8. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA (Act No. 25 of 1999), Section 51. (1). 	<p>Duration of operation</p>	<p>The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.</p>

		<p>9. 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”.</p> <p><u>Phase 1 Cultural Heritage Impact Assessment: Identified sites</u></p> <p>During the survey, the following sites, features or objects of cultural significance were identified.</p> <p>7.1.1 Change finds: A very low number of stone tools dating mostly to the Middle Stone Age have been identified as surface material.</p> <p>7.3.1.1 – 7.3.1.7 Burial sites: A total of seven burial sites were identified. All the sites are known to current land owners, although it seems as if visitation by descendants is very limited.</p> <p>7.3.2.1 Farmstead: A single farmstead was identified that is older than sixty years. It is built in a style that is commonly referred to as Karoo style. It is abandoned and is falling apart.</p> <p>7.3.2.2 Old mine where asbestos was mined – probably Crocidolite, as it is very distinctive blue in colour and is visible in the spoil heaps at the processing plant. The site was probably abandoned during the early 1960s.</p> <p><u>Mitigation measures for identified sites</u></p> <p>7.1.1 No further action required.</p> <p>7.3.1.1 – 7.3.1.7 Avoidance/Preserve: A minimum buffer of 100m must be established around the burial sites for the duration of the prospecting/mining phase.</p> <p>7.3.2.1 Archaeological investigation: This option should be implemented when it is impossible to avoid impacting on an identified site or feature.</p> <p>7.3.2.2 Archaeological investigation: This option should be implemented when it is impossible to avoid impacting on an identified site or feature.</p>		
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		<p><u>Palaeontological desktop assessment</u> Palaeontological heritage is unique and non-renewable and is protected by the NHRA and are the property of the State. It is thus the responsibility of the State to manage and conserve fossils on behalf of the citizens of South Africa. Palaeontological resources may not be excavated, broken, moved, or destroyed by any development without prior assessment and without a permit from the relevant heritage resources authority as per section 35 of the NHRA.</p> <p>It is the responsibility of the Environmental Site Officer (ESO) or site manager of the project to train the workmen and foremen in the procedure to follow when a fossil is accidentally uncovered. In the absence of the ESO, a member of the staff must be appointed to be responsible for the proper implementation of the chance find protocol as not to compromise the conservation of fossil material.</p> <p>Chance Find Procedure</p> <ul style="list-style-type: none"> • If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a 		
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		<p>description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.</p> <ul style="list-style-type: none"> • 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. <p>Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.</p> <ul style="list-style-type: none"> • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area. 		
Waste Management		<p>Litter management</p> <ol style="list-style-type: none"> 1. Refuse bins must be placed at strategic positions to ensure that litter does not accumulate within the construction/prospecting 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 	Duration of operation	The implementation of the recommended mitigation measures will result in the minimisation of impacts to acceptable standards, thereby ensuring compliance with NEMA and Duty of Care as prescribed by NEMA.

		<p>rubble situation on the construction/prospecting site.</p> <ol style="list-style-type: none"> 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/prospecting site, the Contractor shall provide a method statement with regard to waste management. 9. A certificate of disposal shall be obtained by the Contractor and kept on file, if relevant. 10. Under no circumstances may solid waste be burnt on site. 11. All waste must be removed promptly to ensure that it does not attract vermin or produce odours. <p>Hazardous waste</p> <ol style="list-style-type: none"> 12. All waste hazardous materials must be carefully stored as advised by the ECO, and then disposed of offsite at a licensed landfill site, where practical. Incineration may be used where relevant. 13. Contaminants to be stored safely to avoid spillage. 14. Machinery must be properly maintained to keep oil leaks in check. 15. All necessary precaution measures shall be taken to prevent soil or surface water pollution from hazardous materials used during construction/prospecting and any spills shall 		
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		<p>immediately be cleaned up and all affected areas rehabilitated.</p> <p>Sanitation</p> <ol style="list-style-type: none"> 16. The Contractor shall install mobile chemical toilets on the site. 17. Staff shall be sensitised to the fact that they should use these facilities at all times. No indiscriminate sanitary activities on site shall be allowed. 18. Toilets shall be serviced regularly and the ECO shall inspect toilets regularly. 19. Toilets should be no closer than 50m or above the 1:100 year flood line from any natural or manmade water bodies or drainage lines or alternatively located in a place approved of by the Engineer. 20. Under no circumstances may open areas, neighbours fences or the surrounding bush be used as a toilet facility. 21. The construction of “Long Drop” toilets is forbidden, but rather toilets connected to the sewage treatment plant. 22. Potable water must be provided for all construction staff. <p>Remedial actions</p> <ol style="list-style-type: none"> 23. Depending on the nature and extent of the spill, contaminated soil must be either excavated or treated on-site. 24. Excavation of contaminated soil must involve careful removal of soil using appropriate tools/machinery to storage containers until treated or disposed of at a licensed hazardous landfill site. 25. The ECO must determine the precise method of treatment for polluted soil. This could involve the application of soil absorbent materials as well as oil-digestive powders to the contaminated soil. 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. 		
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		<p>28. Materials used for the remediation of petrochemical spills must be used according to product specifications and guidance for use.</p> <p>29. Contaminated remediation materials must be carefully removed from the area of the spill so as to prevent further release of petrochemicals to the environment and stored in adequate containers until appropriate disposal.</p>		
Water Use and Quality	Water pollution	<p>Water Use</p> <ol style="list-style-type: none"> 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. <p>Water Quality</p> <ol style="list-style-type: none"> 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. <p>Stormwater</p> <ol style="list-style-type: none"> 6. The site must be managed in order to prevent pollution of drains, downstream watercourses or groundwater, due to suspended solids and silt or chemical pollutants. 7. Silt fences should be used to prevent any soil entering the stormwater drains. 8. Temporary cut off drains and berms may be required to capture stormwater and promote infiltration. 		

		<ol style="list-style-type: none"> 9. Promote a water saving mind set with construction/prospecting workers in order to Contractor ensure less water wastage. 10. New stormwater construction must be developed strictly according to specifications from engineers in order to ensure efficiency. 11. Hazardous substances must be stored at least 20m from any water bodies on site to avoid pollution. 12. The installation of the stormwater system must take place as soon as possible to attenuate stormwater from the construction phase as well as the operation phase. 13. Earth, stone and rubble is to be properly disposed of, or utilized on site so as not to obstruct natural water path ways over the site. i.e. these materials must not be placed in stormwater channels, drainage lines or rivers. 14. There should be a periodic checking of the site's drainage system to ensure that the water flow is unobstructed. 15. If a batching plant is necessary, run-off should be managed effectively to avoid contamination of other areas of the site. Untreated runoff from the batch plant must not be allowed to get into the storm water system or nearby streams, rivers or erosion channels or dongas. <p>Groundwater resource protection</p> <ol style="list-style-type: none"> 16. Process solution storage ponds and other impoundments designed to hold non fresh water or un-treated process effluents should be lined and be equipped with sufficient wells to enable monitoring of water levels and quality. 17. Prevent dirty water runoff from leaving the general mining area; 18. 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; 		
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		<p>19. Enough supply of absorbent fibre should be kept at the site to contain accidental spills;</p> <p>20. Contain dirty water in return water dams and re-use dirty water for dust suppression and make up water in the plant;</p> <p>21. Proper storm water management should be implemented. Berms should also be constructed to ensure separation of clean water and dirty water areas;</p> <p>22. 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</p> <p>Sanitation</p> <p>23. Adequate sanitary facilities and ablutions must be provided for construction workers (1 toilet per every 15 workers).</p> <p>24. The facilities must be regularly serviced to reduce the risk of surface or groundwater pollution.</p> <p>Concrete mixing</p> <p>25. Concrete contaminated water must not enter soil or any natural drainage system as this disturbs the natural acidity of the soil and affects plant growth.</p> <p>Public areas</p> <p>26. Food preparation areas should be provided with adequate washing facilities and food refuse should be stored in sealed refuse bins which should be removed from site on a regular basis.</p> <p>27. The Contractor should take steps to ensure that littering by construction workers does not occur and persons should be employed on site to collect litter from the site and immediate surroundings, including litter accumulating at fence lines.</p> <p>28. No washing or servicing of vehicles on site.</p>		
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		<p>Infrastructure</p> <p>29. 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.</p>		
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Ecological and Wetland Impact Assessment Report (Appendix 12)

Mitigation Measures

Impact	Source of Impact	Recommended Mitigation Measures
<p>Alteration of the flow regime of the watercourse</p>	<p>Construction:</p> <ul style="list-style-type: none"> • Infrastructure development within watercourses • Removal and disturbance of watercourse habitat and vegetation • Habitat fragmentation • Impoundments within the watercourse • Lack of adequate rehabilitation resulting in colonization by invasive plants <p>Operational:</p> <ul style="list-style-type: none"> • Excavation from the watercourses • Clearing of vegetation • Vehicles driving in and through watercourses <p>Decommissioning:</p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Any activities that take place within 50 meters of a wetland or watercourse or the 1:100 year flood lines will require authorisation in terms of the relevant regulations of NEMA, however as far as possible infrastructure should be placed outside the recommended buffer lines. • Demarcate the watercourse areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas. • Where construction occurs in the demarcated watercourse and buffer areas, additional precautions should be implemented to minimise watercourse loss. • No stockpiling should take place within a watercourse or the calculated buffers. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed stream banks. • 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. • Monitor the occurrence of erosion during the rainy season and take immediate corrective action where needed. • A sensitivity map has been developed for the study area, indicating the wetland systems, and their relevant buffer zones. It is recommended that this sensitivity map be considered during all phases of the development and with special mentioning of the planning of infrastructure, in order to aid in the conservation of and minimise impact on the wetland and aquatic habitat and resources within the study site. • Any areas where bank failure is observed, due to the prospecting impacts, should be immediately repaired. • As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment.

		<ul style="list-style-type: none"> Operational phase activities should not take place within watercourses or buffer zones. The duration of impacts on the wetlands should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. All rehabilitation activities should occur in the dry season. Rehabilitation of disturbed areas as a result of construction must be implemented immediately upon completion of construction.
<p>Changing the physical structure within a water resource (habitat)</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> Infrastructure development within watercourses Loss of vegetation Flow alteration Erosion <p><u>Operational:</u></p> <ul style="list-style-type: none"> Excavation from the watercourses leading to degraded river channels. Removal of substrate within wetlands Clearing of vegetation – vegetation loss Loss of biodiversity Alteration and/or loss of hydrological flow classes Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> Damage to vegetated areas Ineffective rehabilitation measures Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> Other than approved and authorized structures, no other development or maintenance infrastructure is allowed within the delineated watercourse and riparian areas or their associated buffer zones. Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. Monitor the occurrence of erosion during the rainy season and take immediate corrective action where needed. No stockpiling should take place within a watercourse or the calculated buffers. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. All maintenance within watercourses 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 flow alteration and sedimentation will take place is minimised. Rehabilitation must ensure that wetland structure and function are reinstated in such a way as to ensure the ongoing functionality of the systems at pre-prospecting levels. All rehabilitation activities should occur in the dry season.
<p>Alteration of the amount of sediment entering the water resource and associated change in turbidity</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> Vegetation clearance causing sedimentation Earthworks activities Disturbance of soil surface and runoff characteristics Erosion <p><u>Operational:</u></p> <ul style="list-style-type: none"> Excavation from the watercourses leading to degraded river channels. Removal of substrate within wetlands Clearing of vegetation – vegetation loss Loss of biodiversity Alteration and/or loss of hydrological flow classes Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p>	<ul style="list-style-type: none"> Buffer zones should be maintained, in order to minimise sedimentation of the downstream areas. No stockpiling should take place within a watercourse or the calculated buffers. Ensure that erosion management and sediment controls are strictly implemented from the beginning of site clearing activities. All areas should be re-sloped and top-soiled where necessary and reseeded with indigenous grasses to stabilise the loose material. All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed stream banks. As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. Erosion control measures, such as berms, must be implemented to manage runoff from roads to prevent erosion and pollution.

	<ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Rehabilitation of disturbed areas as a result of construction must be implemented immediately upon completion of construction. • Rehabilitation must ensure that riparian structure and function are reinstated in such a way as to ensure the ongoing functionality of the larger riparian systems at pre-prospecting levels. • All rehabilitation activities should occur in the dry season. • The duration of impacts on the riverine systems should be minimised as far as possible by ensuring that the duration of time in which flow alteration and sedimentation will take place is minimised. • Maintain flood capacity, particularly in areas with significant flood hazards.
<p>Alteration of water quality</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Runoff from road surfaces • Discharge of sewage • Discharge of solvents, chemicals and hydrocarbons <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Maintenance of vehicles and machinery • Runoff from road surfaces • Discharge of sewage • Discharge of solvents, chemicals and hydrocarbons • Excavation from the watercourses and the release of nutrients and pollutants from disturbed soils • Removal of substrate within wetlands <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Re-fuelling must take place on a sealed surface area to prevent hydrocarbon pollution. • All spills should be cleaned up immediately and disposed of. • Spill kits should be readily available and easily accessible throughout the site. • All chemicals must be stored safely on site, outside the buffer areas and surrounded by bunds. Chemical storage containers must be regularly inspected for early leak detection. • Littering must be prevented by effective site management and the provision of bins. • Provision of adequate sanitation facilities located outside of the delineated buffer zones. • An emergency spill procedure should be developed and implemented. • No stockpiling should take place within a watercourse. • All stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Stockpiles must be located away from channels, wetlands and drainage lines. • Erosion and sedimentation into channels must be minimised through the effective stabilisation and the re-vegetation of any disturbed riverbanks.
<p>Loss of terrestrial habitat</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> • Clearing of vegetation – vegetation loss <p><u>Operational:</u></p> <ul style="list-style-type: none"> • Removal of substrate within watercourses • Clearing of vegetation during prospecting operations <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> • Damage to vegetated areas • Ineffective rehabilitation measures • Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> • Areas that are stripped during construction and operation should be re-vegetated with indigenous vegetation. • It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon (including fencing off the defined project area) and preventing movement of workers into natural areas. • The duration of the prospecting should be minimized to as short term as possible, in order to reduce the period of disturbance on fauna and flora. • Areas of indigenous vegetation should under no circumstances be fragmented or disturbed for used as an area for dumping of waste. • As far as possible the existing road network should be utilised, minimising the need to develop new access routes resulting in an increased impact on the local environment. • All staff and visitors to the site must undergo an induction process and must be made aware of the sensitive nature of the environment and floral species which occur there. • The area must be re-vegetated with plant and grass species which are endemic to the exact vegetation types.

		<ul style="list-style-type: none"> • Rehabilitation measures that are implemented must be continually monitored to ensure that proper succession has occurred and that there is no erosion occurring. • An alien invasive vegetation management plan should be developed and implemented. • Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat.
<p>Loss of Aquatic Biota</p>	<p>Construction:</p> <ul style="list-style-type: none"> • Runoff from road surfaces • Sedimentation • Discharge of solvents, chemicals and hydrocarbons <p>Operational:</p> <ul style="list-style-type: none"> • Maintenance of vehicles and machinery • Runoff from road surfaces • Discharge of solvents, chemicals and hydrocarbons • Excavation from the watercourses and the release of nutrients and pollutants from disturbed soils • Removal of substrate within wetlands • Sedimentation 	<ul style="list-style-type: none"> • Biomonitoring of aquatic macro-invertebrates within the riverine systems is essential.
<p>Loss of Terrestrial Fauna</p>	<p>Construction and Operational:</p> <ul style="list-style-type: none"> • Vegetation loss and disturbance – clearing of vegetation • Excessive noise disturbances • Illegal hunting • Habitat fragmentation destruction • Vehicles driving through natural vegetated areas 	<ul style="list-style-type: none"> • Site clearing to take place in a phased manner (where possible) to allow for any faunal species present to move away from the study site to the surrounding open space areas. • Prior and during vegetation clearance any larger fauna species noted should be given the opportunity to move away from the construction machinery. • Fauna species such as frogs and reptiles that have not moved away should be carefully and safely removed to a suitable location beyond the extent of the development footprint by a suitably qualified ECO trained in the handling and relocation of animals. • Fencing should be erected around the project area to prevent workers and members of the public from entering the surrounding environments. This fence should have small openings to allow wildlife to pass through. • Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. • Should any sensitive or Red Data animal or bird species be encountered during the construction, operation and decommissioning activities, these should be relocated to natural areas in the vicinity. Any sensitive fauna that are inadvertently killed during earthmoving operations should be preserved as museum voucher specimens. • No hunting, trapping or killing of fauna are allowed. • Any lizards, snakes or monitors encountered should be allowed to escape to a suitable habitat away from disturbance. • 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.

		<ul style="list-style-type: none"> Trenches and deep excavations should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are exposed should contain soil ramps allowing fauna to escape the trench.
<p>Loss of Terrestrial Flora</p>	<p><u>Construction and Operational:</u></p> <ul style="list-style-type: none"> Vegetation clearance Vehicles driving through natural vegetated areas Habitat fragmentation and destruction 	<ul style="list-style-type: none"> Areas that are stripped during construction and operation should be re-vegetated with indigenous vegetation as soon as possible. This will also reduce the likelihood of encroachment by alien invasive plant species. Protected trees and plants shall not be removed or damaged without prior approval, permits or licenses from the relevant authority. This is especially applicable to the Protected Camel Thorn (<i>Vachellia erioloba</i>) and Sheperd's tree (<i>Boscia albitrunca</i>) which were present on site.
<p>Introduction and spread of alien vegetation</p>	<p><u>Construction:</u></p> <ul style="list-style-type: none"> Clearing of vegetation <p><u>Operational:</u></p> <ul style="list-style-type: none"> Removal of substrate within watercourses Clearing of vegetation during prospecting operations Vehicles driving in and through watercourses <p><u>Decommissioning:</u></p> <ul style="list-style-type: none"> Damage to vegetated areas Ineffective rehabilitation measures Vehicles driving in and through watercourses 	<ul style="list-style-type: none"> Proliferation of alien and invasive species is expected within any disturbed areas particularly as there are some alien and invasive species present within the study site. These species should be eradicated and controlled to prevent further spread beyond. An alien invasive vegetation management plan should be developed and implemented. Alien and invasive vegetation control should take place throughout all phases to prevent loss of floral habitat. 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	<ul style="list-style-type: none"> Conduct regular internal audits Conduct regular external audits 	<ul style="list-style-type: none"> Environmental Manager Suitable qualified environmental auditor 	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Prospecting of Diamonds Alluvial (DA), Diamonds General (D) and Diamonds in Kimberlite (DK) – excavations	Loss of topsoil Erosion Air Pollution Noise Impact on potential cultural, heritage artefacts and fossils	<ul style="list-style-type: none"> Conduct regular internal audits Conduct regular external audits 	<ul style="list-style-type: none"> Environmental Manager Suitable qualified environmental auditor 	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Waste management	Pollution	<ul style="list-style-type: none"> Conduct regular internal audits Conduct regular external audits 	<ul style="list-style-type: none"> Environmental Manager Suitable qualified environmental auditor 	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.
Water Use and Quality	Water pollution	<ul style="list-style-type: none"> Conduct regular internal audits Conduct regular external audits 	<ul style="list-style-type: none"> Environmental Manager Suitable qualified environmental auditor 	Monitoring should be undertaken for duration of operations. Internal audits should be undertaken at least every 6 months. External audits should be undertaken by a suitably qualified auditor on an annual basis. Reports should be made available to the competent authority if required.

Phase 1 Cultural Heritage Impact Assessment

MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the proposed development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

Sources of risk were considered with regards to development activities defined in Section 2(viii) of the NHRA that may be triggered and are summarised in Table 2A and 2B below. These issues formed the basis of the impact assessment described. The potential risks are discussed according to the various phases of the project below.

Objectives

- *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 National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).*

Control

In order to achieve this, the following should be in place:

- *A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.*
- *Known sites should be located and isolated, e.g. by fencing them off. All construction workers should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.*
- *In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.*

Table 2A: Construction Phase: Environmental Management Programme for the project

Action required	Protection of heritage sites, features and objects		
Potential Impact	The identified risk is damage or changes to resources that are generally protected in terms of Sections 27, 28, 31, 32, 34, 35, 36 and 37 of the NHRA that may occur in the proposed project area.		
Risk if impact is not mitigated	Loss or damage to sites, features or objects of cultural heritage significance		
Activity / issue	Mitigation: Action/control	Responsibility	Timeframe
1. Removal of Vegetation 2. Construction of required infrastructure, e.g. access roads, water pipelines	See discussion in Section 9.1 above	Environmental Control Officer	During construction only
Monitoring	See discussion in Section 9.2 above		

Table 2B: Operation Phase: Environmental Management Programme for the project

Action required	Protection of heritage sites, features and objects		
Potential Impact	It is unlikely that the negative impacts identified for pre-mitigation will occur if the recommendations are followed.		
Risk if impact is not mitigated	Loss or damage to sites, features or objects of cultural heritage significance		
Activity / issue	Mitigation: Action/control	Responsibility	Timeframe
1. Removal of Vegetation 2. Construction of required infrastructure, e.g. access roads, water pipelines	See discussion in Section 9.1 above	Environmental Control Officer	During construction only
Monitoring	See discussion in Section 9.2 above		

Baseline Hydrogeological Investigation

Groundwater Monitoring System

The groundwater monitoring network design should comply with the risk-based source-pathway-receptor principle. A groundwater-monitoring network should contain monitoring positions which can assess the groundwater status at certain areas. Both the impact on water quality and water quantity should be catered for in the monitoring system. The boreholes in the network should cover the following:

- Contaminant sources;
- Sensitive receptors; and
- Potential dewatering extent.

Furthermore, monitoring of the background water quality and levels is also required. Groundwater monitoring should be conducted to assess the following:

- Groundwater quality trends; and
- Groundwater levels.

The proposed monitoring network is presented in Table 8-1 and Table 8-2. Two boreholes are recommended to be monitored.

Table 8-1: Proposed Monitoring Network

Name	Co-ordinates (WGS, 84)		Status
	Latitude	Longitude	
BF-BH1	-29.327897	22.467059	Domestic water supply
BF-BH6	-29.337213	22.452198	Livestock watering

Table 8-2: Groundwater monitoring programme

Monitoring position	Sampling interval	Analysis	Water Quality Standards
All monitoring boreholes	Bi-annually: measuring the depth of groundwater levels	N/a	N/a
All monitoring boreholes	Annually: sampling for water quality analysis	<ul style="list-style-type: none"> • Full analyses and full metals annually • Groundwater level 	<ul style="list-style-type: none"> • SANS241:2015 Drinking Water Standards • Water Use License/EMP requirements (if applicable)

Monitoring Parameters

The identification of the monitoring parameters is crucial and depends on the chemistry of possible pollution sources. They comprise a set of physical and/or chemical parameters (e.g., groundwater levels and predetermined organic and inorganic chemical constituents).

Once a pollution indicator has been identified it can be used as a substitute to full analysis and therefore save costs. The use of pollution indicators should be validated on a regular basis in the different sample positions. The parameters should be revised after each sampling event.

Full analysis

- Physical Parameters:
 - Groundwater levels
- Chemical Parameters:
 - Field Measurements: pH; EC; Temperature
 - Laboratory Analyses:
 - ❖ Anions (Cl, F, SO₄, NO₃, NH₄)
 - ❖ Cations and Metals (Ca, Mg, Na, K, Sb, As, Ba, B, Cd, Cr, Cu, CN, Fe, Pb, Mn, Hg, Ni, Se, U, Al and Zn)
 - ❖ Other: pH, EC and TDS.

Laboratory analysis techniques should comply with SANAS guidelines. The groundwater monitoring database should be updated on an information becomes available. The database should be used to analyse the information and evaluate trends noted.

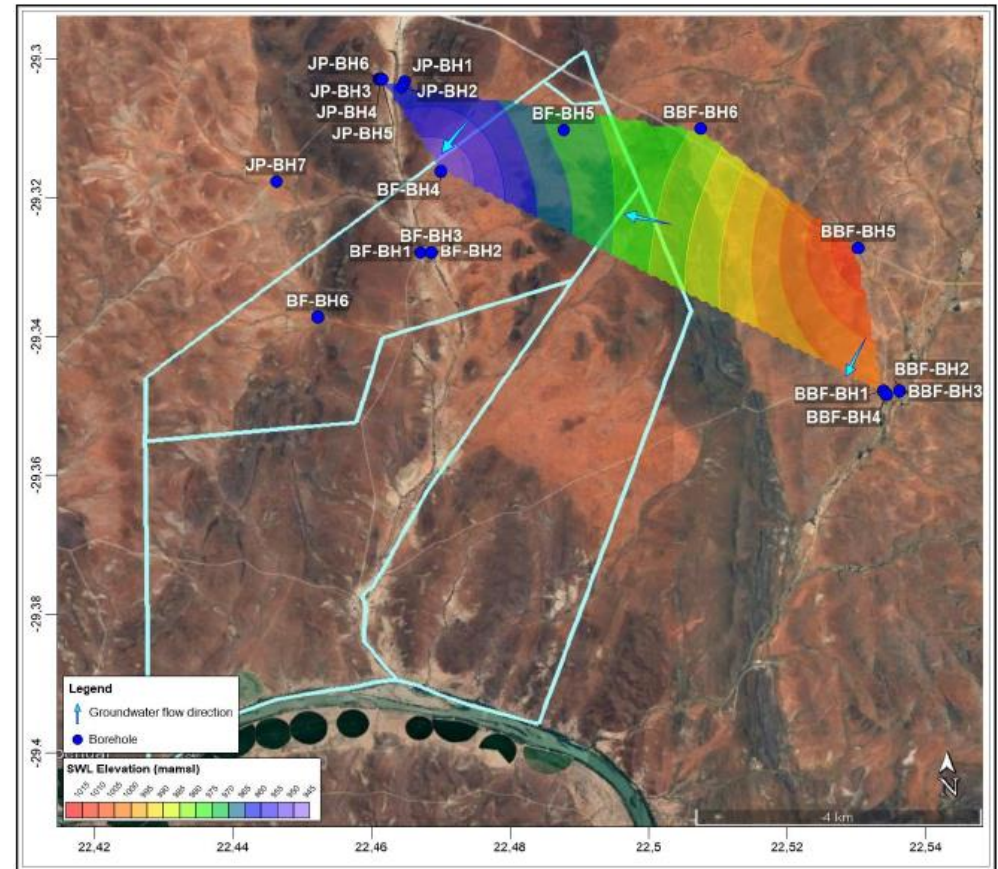


Figure 28: Groundwater flow direction (Appendix 12)

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*****