mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT: **Alet Maritz Mynbou (Pty) Ltd**
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FILE REFERENCE NUMBER SAMRAD: **(NC) 30/5/1/1/2/12908 PR**

1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act, 2002 (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, 1998 (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

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

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

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

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

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

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;

(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

(c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) determine the—

  (i) nature, significance, consequence, extent, duration, and probability of the impacts occurring to inform identified preferred alternatives; and

  (ii) degree to which these impacts—

    (aa) can be reserved;

    (bb) may cause irreplaceable loss of resources; and

    (cc) can be avoided, managed or mitigated.

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to manage, avoid or mitigate identified impacts; and

(h) identify residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

3. Contact Person and Correspondence Address

a) Details of:-

i) Details of the EAP who prepared the report:

Name of the Practitioner:	**ROELIEN OOSTHUIZEN**
Tel No.:	**084 208 9088**
Fax No.:	**086 510 7120**
E-mail address:	roosthuizen950@gmail.com
Physical Address:	**Farm Oberon; Kimberley, 8301**
Postal Address:	**P.O. Box 110823, Hadisonpark, 8306**

ii) Appointed by:

Alet Maritz Mynbou (Pty) Ltd

iii) Expertise of the EAP

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

Registered as an Environmental Assessment Practitioner: Number 2019/1467 (EAPASA)
Masters in Environmental Management (UFS)
B-Comm in Human and Industrial- Psychology (NWU)
(with evidence attached as **Appendix 1**)

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

(In carrying out the Environmental Impact Assessment Procedure)

Relevant past experiences in carrying out the Environmental Impact Assessment Procedures include Environmental Impact Assessments, Environmental Management Plans/Programmes/ Reports, Performance assessments, Rehabilitation progress assessments, Environmental Liability assessments, Environmental compliance monitoring, Scoping Reports, etc. See attached CV.
(with evidence attached as **Appendix 2**)

b) Description of the property

Farm Name:	**THE REMAINING EXTENT OF PORTION 2 OF THE FARM WALTON 390 IN THE DISTRICT OF KURUMAN, NORTHERN CAPE PROVINCE, REPUBLIC OF SOUTH AFRICA.**
Application area (Ha)	856.4981 ha (Eight hundred and fifty-six comma four nine eight one hectares)
Magisterial district:	Kuruman, Northern Cape Province
Distance and direction from nearest town	The property is located ±35 km west of Kuruman and ± 20 km north of Kathu on the N14 with a further 20 km on a gravel road north of the N14.
21-digit Surveyor General Code for each farm portion	**Remaining Extent of Portion 2 Of the Farm Walton no. 390. C04100000000039000002** **Total Extent of application area: 856.4981 ha**

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

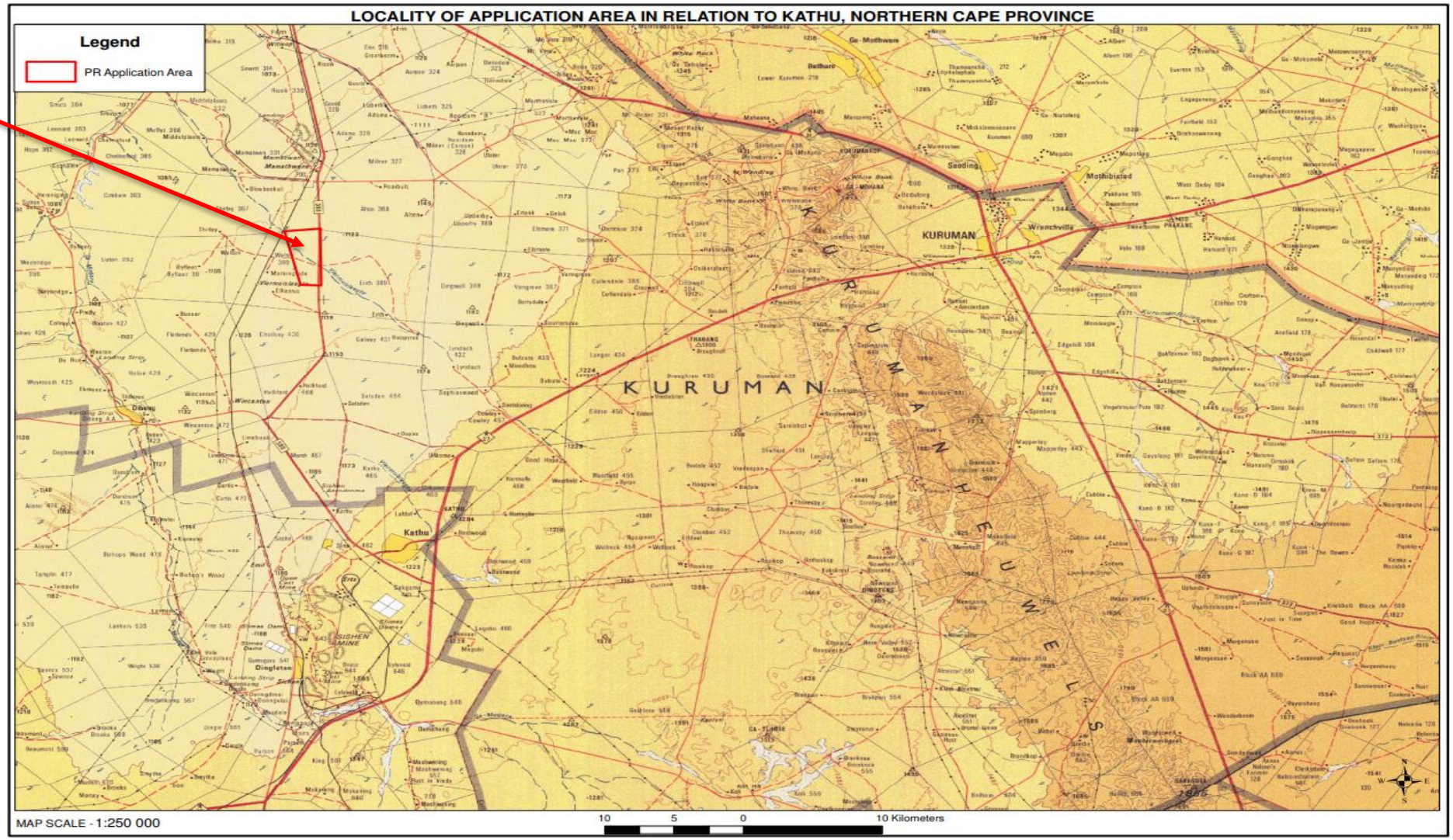

Figure 1. 1: 250 000 Topocadastral map KIMBERLEY 2824 indicating the application area with RED BLOCKS.

d) Description of the scope of the proposed overall activity (provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site)

LOCATION OF LISTED ACTIVITIES ON PROPERTIES WILL BE DETERMINED AFTER FIRST PHASE OF PROSPECTING HAVE BEEN FINALIZED

Figure 2. The proposed core footprint of prospecting activities in the study area is indicated in white only in the blue figure.

i) Listed and specified activities

Table 1: Listed and Specified Activities

Name of activity (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the activity (Ha or m²)	Listed Activity (mark with an X where applicable or affected)	Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed GNR983, GNR984, GNR985/ Not listed)
Activity 9: "The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (vii) with an internal diameter of 0.36 metres or more; or (viii) with a peak throughput of 120 litres per second or more;	Water distribution Pipelines which are not anticipated but is included for completeness should it become necessary	X	NEMA: LN1 (GNR327)
Activity 12: "The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or **(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse"** Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities)	Clean and dirty water system It is anticipated that the operation will establish storm water control berms and trenches to separate clean and dirty water on the prospecting site.	X	NEMA: LN1 (GNR327)
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 –	856.4981ha The total area will NOT be prospected.	X	NEMA: LN1 (GNR327)

(a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, crushing, screening or washing; But excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing notice 2 applies.	Invasive Prospecting Pits 20 pits 2m X 3m X0.5 - 1m 10 trenches 100m X 50m X 0.5 – 1m = 5.012 ha pits that prove to contain kieselgurh (tested positive). It is estimated that on average 0.5 m of overburden (calcrete and soil) will be removed before accessing the kieselguhr layer (average width 0.5 -2m).		
Activity 24(ii) of NEMA Listing Notice 1 The development of a road- (i) For which an environmental authorization was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) With a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; But excluding a road- (a) Which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) Where the entire road falls within an urban area; or (c) Which is 1 kilometre or shorter.	±1500m² on the Area.	X	NEMA: LN1 (GNR327)

Activity 27 of NEMA Listing Notice 1 The clearance of an area of 1 hectare or more, but less than 20 ha of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) The undertaking of a linear activity; or (ii) Maintenance purposes undertaken in accordance with a maintenance management plan.	A total of 5 hectares will be physically disturbed were the kieselgurh material will be removed.	X	NEMA: LN1 (GNR327)
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) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing. The Maritz operation directly relates to prospecting of a mineral resource (Kieselgurh) and requires permission in terms of Section 20 (MPRDA), for the removal and disposal of bulk samples of any minerals.	856.4981ha. Although the total area will never be prospected and the footprint with the bulk sampling is calculated to be ±5ha.	X	NEMA: LN2 (GNR325)
Activity 12(g) i & ii of Listing Notice 3 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically	856.4981ha	X	GNR 985

endangered in the National Spacial Biodiversity Assessment 2004; ii. Within critically biodiversity areas identified in bioregional plans;			
(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).	0.2ha		NEMWA: Category A (GNR 633)
Office complexes Temporary workshop facilities Storage facilities Ablution facilities Topsoil stockpiles Overburden stockpiles	± 200 m² ± 300 m² ± 2 00 m² ± 30 m² ± 300 m² ±300 m²		Not Listed
Waste disposal site (domestic and industrial waste): It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area: • Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.	5m x 10m = 50m²		Not Listed

ii) Description of the activities to be undertaken

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

PHASE 1

Review of Past Exploration Results

In order to direct the exploration programme in an efficient manner, there will be a review of all information and data gathered during previous exploration. A site investigation of the target areas will be undertaken to identify infrastructure and determine any potential problems that may need to be addressed.

Imagery Analysis & Geological Mapping

High-resolution satellite images will be studied and used to geologically map the application area.

PHASE 2
Invasive Prospecting Pits

Invasive Prospecting Pits will be positioned also on a grid of 100m X 100m or 100m X 50m.

PHASE 3

DESCRIPTION OF BULK SAMPLING ACTIVITIES

Table 2: Bulk Sampling Activities

ACTIVITY		DETAILS		
Number of pits/trenches planned		20 pits/ 10 trenches		
	Number of pits/trenches	Length	Breadth	Depth
	20 pits	2m	3m	0.5 - 1m
	10 trenches	100m	50m	0.5 – 1m
Locality		The location of the trenches will be verified during a site reconnaissance visit and after the pre-feasibility studies has been compiled.		
Volume Overburden (Waste)		Pits (20 X 2 X 3 X 0.5) = 60m³ Trenches (10 X 100 X 50 X 1) = 50 000m³		
Volume Ore		Pits 360 m³		

	Trenches 150 000 m³
Density Overburden	**1.8**
Density Ore	**0.4**
Phase(s) when bulk sampling will be required	**Month 13 – 49 Phase 4**
Timeframe(s)	**From time to time during Month 13 - 49**

NOTE: Detailed description of the required costs MUST be indicated in the cost estimate as per Regulation 7(1) (k)

PHASE 4

Analytical Desktop Study

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

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

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

The initial prospecting activities will be non-invasive and restricted to a desktop study which included a literature survey, plus aerial photograph and satellite image interpretation, and ground validation of targets in the first year. Subsequent phases will be of the invasive-type, typically pitting, or trenching aimed at recovering suitably representative samples to determine grade and quality.

Bulk sample test work will be undertaken to test the grade and quality and ultimately the economic viability of the potential deposit.

A standard phased approach to all prospecting activities will be implemented. Each prospecting activity will be undertaken on a scheduled timeline, with some activities being run concurrently, while others sequentially. Specific milestones will be determined and used as a basis for decisions regarding further activities related to the PWP. The total duration of the prospecting and evaluation activities is planned for five (5) years.

Waste Management

Proper sanitation facilities will be provided for employees. No person will pollute the workings with faeces or urine, misuse the facilities provided or inappropriately foul the surrounding environment with faeces or urine. Acceptable hygienic and aesthetic practices will be adhered to. Non-biodegradable refuse such as glass bottles, plastic bags, etc. will be sorted and stored in separate lockable containers at a central point. It will be disposed of at a recognised disposal facility regularly.

Biodegradable refuse will either be handled as indicated, or be buried in a pit excavated for that purpose and covered with layers of soil when almost full. A final 0,5m thick layer of topsoil will be incorporated where practicable. Provision will be made for the future subsidence of the covering. Refuse will not be dumped in the vicinity of the prospecting area. Waste material with regard to vehicle repairs will be kept in 200 litres steel containers in the maintenance/farmstead area. This material will be disposed of at a recognised disposal facility once a month.

Access Roads

The property is located ±35 km west of Kuruman and ± 20 km from Kathu north on the N14 with a further 20 km on a gravel road north of the N14. Activities associated with the Mine that is expected to make use of these roads include: -

- The transportation of personnel to and from the site;
- Delivery of supplies and materials;
- The transportation of the product for the market.

These transport operations will make use of passenger vehicles, light delivery vehicles and very limited heavy vehicles.

e) Policy and Legislative Context

Applicable Legislation and Guidelines used to compile the report (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.)	Reference where applied	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g In terms of the National Water Act:-Water Use License has/has not been applied for).
Conservation of Agricultural Resources Act (Act 43 of 1983) and Regulations (CARA)	- Section 5: Implementation of control measures for alien and invasive plant species; - Section 6: Control measures. - Regulation GN R1048, published on 25 May 1984, in terms of CARA	- Control measures are to be implemented upon the approval of the EMPR.
Constitution of South Africa (Act 108 of 1996)	- Section 24: Environmental right - Section 25: Rights in Property - Section 27: Water and sanitation right	- To be implemented upon the approval of the EMPR.
Environment Conservation Act (Act 73 of 1989) and Regulations (ECA)	- Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities that still relate to the existing section of ECA. - Section 28A: Exemptions.	- To be implemented upon the approval of the EMPR.
Fencing Act (Act 31 of 1963)	- Section 17: States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.	- Control measures are to be implemented upon the approval of the EMPR.
Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA	- Definition, classification, use, operation, modification, disposal or dumping of hazardous substances.	- Noted and Considered measures are to be implemented upon the approval of the EMPR.

Intergovernmental Relations Act (Act 13 of 2005)	- This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations.	
Mine, Health and Safety Act (Act 29 of 1996) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended	- Entire Act. - Regulations GN R527	- A Prospecting Right has been applied for (NC) 30/5/1/1/2/12908 PR. - Rights and obligations to be adhered to.
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	- Section 2: Strategic environmental management principles, goals and objectives. - Section 24: Foundation for Environmental Management frameworks. - Section 24N: - Section 24O: - Section 28: The developer has a general duty to care for the environment and to institute such measures to demonstrate such care. - Regulations GN R547, more specifically Chapters 5 and 7, where applicable (the remainder was repealed) published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations) - Regulations GN R982 to R985, published on 4 December 2014 in terms of NEMA (Listed Activities) - Regulations GN R993, published on 8 December 2014 in terms of NEMA (Appeal) - Regulations GN R994, published on 8 December 2014 in terms of NEMA (exemption)	- Control measures are to be implemented upon the approval of the EMPR.

	- Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations) - Regulations GN R1147, published on 20 November 2015 in terms of NEMA (Financial Provision)	
National Environmental Management: Air Quality Act (Act 39 of 2004)	- Section 32: Control of dust - Section 34: Control of noise - Section 35: Control of offensive odours - Regulation GN R551, published on 12 June 2015 (amended Categories 1 to 5 of GN 983) in terms of NEM:AQA (Atmospheric emission which have a significant detrimental effect on the environment) - Regulation GN R283, published on 2 April 2015 in terms of NEM:AQA (National Atmospheric Emissions Reporting Regulations) (Group C-Mines)	- Control measures are to be implemented upon the approval of the EMPR. - This is also legislated by Mine Health and Safety from DMR and is to be adhered to.
National Environmental Management: Biodiversity Act (Act 10 of 2004)	- Section 52 of The National Environmental Management Act: Biodiversity Act (NEMBA) (Act 10 of 2004) states that the MEC/Minister is to list ecosystems that are threatened and in need of protection. - Section 53 states that the Minister may identify any process or activity in such a listed ecosystem as a threatening process. - A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations. Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007 GNR 150/GG 29657/23-02-2007 Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 *	- A permit application regarding protected plant species need to be lodged with DENC if any protected species is encountered. Control measures are to be implemented upon the approval of the EMPR.

	Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 * - Sections 65 – 69: These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species. - Sections 71 and 73: These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species. - Regulation GN R151, published on 23 February 2007 (List of Critically Endangered, Vulnerable and Protected Species, 2007) in terms of NEM: BA - Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA - Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species)	
The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa's natural biodiversity and its landscapes and seascapes.	- Chapter 2 lists all protected areas.	- Not applicable.
National Environmental Management: Waste Management Act (Act 59 of 2008)	- Chapter 4: Waste management activities - Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations) - Regulations GN R921 published on 29 November 2013 in terms of NEM:WA (Categories A to C – Listed activities) - National Norms and Standards for the Remediation of contaminated Land and Soil Quality published on 2 May	- To be implemented upon the approval of the EMPR.

	2014 in terms of NEM:WA (Contaminated land regulations) - Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations) - Regulations GN R632 published on 24 July 2015 in terms of NEM: WA (Planning and Management of Mineral Residue Deposits and Mineral Residue Stockpiles) - Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste management activities list published under GN921)	
National Forest Act (Act 84 of 1998) and Regulations	- Section 15: No person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.	- A permit application regarding protected tree species need to be lodged with DAFF if necessary and determined by a specialist study. - Control measures are to be implemented upon the approval of the EMPR.
National Heritage Resources Act (Act 25 of 1999) and Regulations	- Section 34: No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. - Section 35: No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site. - Section 36: No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a forma cemetery administered by a local authority.	- Control measures are to be implemented upon the approval of the EMPR. Fossil finds procedure are attached to the PIA.

	- Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during HIA process. - Regulation GN R548 published on 2 June 2000 in terms of NHRA	
National Water Act (Act 36 of 1998) and regulations as amended, *inter alia* Government Notice No. 704 of 1999	- Section 4: Use of water and licensing. - Section 19: Prevention and remedying the effects of pollution. - Section 20: Control of emergency incidents. - Section 21: Water uses In terms of Section 21 a licence is required for: (a) taking water from a water resource; (b) storing water; (c) impeding or diverting the flow of water in a watercourse; (f) Waste discharge related water use; (g) disposing of waste in a manner which may detrimentally impact on a water resource; (i) altering the bed, banks, course or characteristics of a watercourse; (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and; - Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for prospecting and related activities) - Regulation GN R1352, published on 12 November 1999 in terms of the National Water Act (Water use to be registered)	- A water use application will not be submitted as no water is required for the process. - Control measures are to be implemented upon the approval of the EMPR.

	- Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams) - Regulation GN R398, published on 26 March 2004 in terms of the National Water Act (Section 21 (j)) - Regulation GN R399, published on 26 March 2004 in terms of the National Water Act (Section 21 (a) and (b)) - Regulation GN R1198, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i) – rehabilitation of wetlands) - Regulations GN R1199, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i)) - Regulations GN R665, published on 6 September 2013 in terms of the National Water Act (Amended GN 398 and 399 – Section 21 (e), (f), (h), (g), (j))	
Nature Conservation Ordinance (Ord 19 of 1974)	- Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of Flora.	- Control measures are to be implemented upon the approval of the EMPR.
Northern Cape Nature Conservation Act (Act 9 of 2009)	- Addresses protected species in the Northern Cape and the permit application process related thereto.	- A permit application regarding provincially protected plant species as well as for large-scale harvesting of indigenous flora need to be lodged with DENC if necessary and will be determined by the specialist study. - Control measures are to be implemented upon the approval of the EMPR.
Occupational Health and Safety Act (Act 85 of 1993) and Regulations	- Section 8: General duties of employers to their employees. - Section 9: General duties of employers and self-employed persons to persons other than their employees.	- Control measures are to be implemented upon the approval of the EMPR.

Road Traffic Act (Act 93 of 1997) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Water Services Amendment Act (Act 30 of 2007)	- It serves to provide the right to basic water and sanitation to the citizens of South Africa (giving effect to section 27 of the Constitution).	- Control measures are to be implemented upon the approval of the EMPR.
National Land Transport Act, (Act 5 of 1998)		- To take note.
Northern Cape Planning and Development Act (Act 7 of 1998)	- To control planning and development	- To be implemented upon the approval of the EMPR.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	- To provide a framework for spatial planning and land use management in the Republic; - To specify the relationship between the spatial planning and the land use management, amongst others - Regulations GN R239 published on 23 March 2015 in terms of SPLUMA	- To be implemented upon the approval of the EMPR.
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	- Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land	- To take note.
Basic Conditions of Employment Act (Act 3 of 1997)) as amended	- To regulate employment aspects	- To be implemented upon the approval of the EMPR
Community Development (Act 3 of 1966)	- To promote community development	- To be implemented upon the approval of the EMPR
Development Facilitation (Act 67 of 1995) and regulations	- To provide for planning and development	- To take note.
Development Facilitation (GN24, PG329, 24/07/1998)	- Regulations re Northern Cape LDO's	- To take note.
Development Facilitation (GNR1, GG20775, 07/01/2000)	- Regulations re application rules S26, S46, S59	- To take note.
Development Facilitation (GN732, GG14765, 30/04/2004)	- Determines amount, see S7(b)(ii)	- To take note.
Land Survey Act (Act 8 of 1997)) and regulations, more specifically GN R1130	- To control land surveying, beacons etc. and the like; - Agriculture, land survey S10	- To take note.

National Veld and Forest Fire Act (Act 101 of 1998)) and regulations, more specifically GN R1775	- To regulate law on veld and forest fires - (Draft regulations s21)	- To be implemented upon approval of the EMPR
Municipal Ordinance, 20/1974	- To control pollution, sewers etc.	- To be implemented upon approval of the EMPR
Municipal Ordinance, PN955, 29/08/1975	- Nature conservation Regulations	- To be implemented upon approval of the EMPR
Cape Land Use Planning Ordinance, 15/85	- To control land use planning	- To take note.
Cape Land Use Planning Ordinance, PN1050, 05/12/1988	- Land use planning Regulations	- To take note.

f) Need and desirability of the proposed activities

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

The major land uses in the region include activities related to agriculture, hunting and mining. The land capability of the study area is non-arable, with moderately low potential for grazing and wildlife. The agricultural region is demarcated for cattle farming, with the grazing capacity estimated at 11 Ha/LSU. The study area is not suitable for crop irrigation. Currently, the farms are utilised as natural pastures for domestic livestock. A few small-scale historic diggings and old fields are also present. Existing infrastructure include roads, homesteads, and farm buildings. A provincial road dissects the study area, and it is currently being upgraded, with a road construction site established on Erith.

The areas applied for is over the farms Walton and Erith consist of small portions of the farms, the kieselguhr is a diatomaceous earth which consists mainly of accumulated shells or frustules of intricately structured amorphous hydrous silica secreted by diatoms.

As the Olifantshoek and Kathu areas only have the iron ore and manganese operations the Kieselguhr can also be a source of income and the Kieselguhr prospecting operation in the areas would provide an income for the region and jobs for the nearby community if the prospecting operations proves to be positive.

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

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

This section converses the determination of the specific site layout having taken into consideration the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

i) Details of the development footprint alternatives considered

With reference to the site plan provided as Figure 2 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

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

(a) The registered description of the land to which the prospecting right application relates:

THE REMAINING EXTENT OF PORTION 2 OF THE FARM WALTON 390, KURUMAN

IN EXTENT: 856.4981ha

Alternatives considered: -

No planned alternative to proposed prospecting is envisaged. Should prospecting not proceed the current agricultural land use will continue. Proposed site layout and opencast operation with concurrent rehabilitation where possible will minimise footprint and impact. Any alternative methodology may have greater impact. Alternatives may be looked at in more detail within the Scoping, EIA EMP Report.

The only other alternative would be not to continue with the operation.

(b) The type of activity to be undertaken:

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed development enables sustainable development, a number of feasible options must be explored. The various alternatives were assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality the prospecting operation do not form part of the discussion as the location of the prospecting operation is determined by the geological location of the mineral resource (as discussed in section f).

Land Use

Land use within the broader study area mainly relates to farming activities. Farming practises consist mainly of cattle and game farming and to a lesser extent sheep and goats. Apart from agricultural practices, mining forms the largest industrial activity in the area (e.g., Mamathwane close to the study area).

It would however be feasible to determine if there is any economically viable minerals to mine as prospecting can also generate income for the property owner that can be used for further development of the property.

The prospectors will have to promote rehabilitation strategies to ensure that open pits and trenches are backfilled.

Project Infrastructure

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

Prospecting Method

The entire proposed prospecting project at Kuruman will be conducted in four phases as described below over a period of 60 months. This prospecting will consist of non-invasive and invasive (Bulk Sampling) activities. The review of available information that exists over the area of interest will be undertaken by means of conducting a literature review from satellite images and other available information.

(c) The design or layout of the activity:

The site infrastructure will need to be strategically placed by incorporating prospecting project demands and environmental sensitivities identified during the Environmental Impact Assessment process. Thus, the site layout will primarily be based on proximity to the nearby access roads, proximity to the areas earmarked for bulk sampling as well as limited additional impact on the environmental (non-perrennial drainage lines and wind direction), heritage resources and discussions with the relevant Departments.

The following infrastructure will be established and will be associated with the prospecting operation:

a. Ablution Facilities: In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.

b. Clean & Dirty water system: Berms
It is anticipated that the operation will establish stormwater control berms and trenches to separate clean and dirty water on the prospecting site.

c. Fuel Storage facility :
A Diesel Car is the only fuel storage that is taking place on the Application area

d. Prospecting Area: Area applied for to pit and trench for kieselguhr (bulk sampling).

e. Equipment: One 40-t articulated dump truck supported by 1 excavator and one front-end loader

f. Roads (both access and haulage road on the prospecting site):
Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the prospecting operation will create an additional 1500m² of roads, with a width of 8 meters where no reserve exists and where the reserve exists 15 meters.

g. Salvage yard (Storage and laydown area).

h. Residue stockpile area.

i. Waste disposal site
The operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area:

- Small amounts of low-level hazardous waste in suitable receptacles;
- Domestic waste;
- Industrial waste.

j. Temporary Workshop Facilities and Wash Bay.

k. Water distribution Pipeline.

l. Water tank: It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

Alternatives considered: -

Alternatives for fuel storage include surface storage, underground storage and the storage of fuel in mobile tanks with a metal bund wall. Underground storage has an adverse negative pollution potential, because it is not easy to monitor leakages. Remediation measures are also not as effective as compared to surface storage tanks. Mobile tanks are a viable option for open cast activities, but the best viable long-term option is the instalment of fuel tanks within a concrete bund wall. The final location of the fuel storage tanks will be determined based on proximity to site operations.

The proposed prospecting area is not located near any surface water resources such as rivers or dams and thus the only viable water source will be ground water. However, the proposed site does have a non-perrinial drainage line which may contain water during heavy rainfall events (Vlermuisleegte).

In terms of power generation, the options available was for Generators or ESKOM power. All of the electricity needs for the operations will be generated by a diesel generator and there would therefore be no additional pressure on the Eskom Electricity Grid.

In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.

(d) The technology to be used in the activity:

- Technique

  The area will be excavated (opencast method) with an excavator, material will be stockpiled next to the open area and kieselguhr loaded onto the trucks by a frond end loader. The trucks will transport the Kieselguhr via a newly constructed road, which will be constructed to the required safety standard. No provincial roads will be used.

- Technology

  The Kieselgurh is removed from the site no processing of the product takes place and samples are removed for testing of quality and quantity.

Alternatives considered: -

There is no other feasible, alternative prospecting method for the bulk sampling of kieselguhr.

(e) The operational aspects of the activity:

The topsoil will be removed and the kieselgurh will be loaded with an excavator on to dump trucks for conveyance to the laboratory.

Prospecting activities will primarily make use of existing roads, but additional roads will most likely be created.

Alternatives considered: -

The conventional opencast load-haul-bulk sampling method has been proven to be the most economic viable method currently being used by the kieselguhr fraternity. There is no other feasible, alternative bulk sampling method for the prospecting and extraction of possible kieselguhr.

(f) The option of not implementing the activity:

Potential land use includes grazing and prospecting. The majority of the area is classified to have potential for grazing land. Therefore, prospecting activities are believed to be the most economically beneficial option for the area to establish any potential for mineral resources. No agricultural lands will be disturbed.

Land Use

The current land use is agriculture and grazing. If the prospecting operation does not continue, the grazing capacity and agriculture will continue.

Socio-Economy

The operation will make provision for 4 to 10 job opportunities. This will be lost if the project does not proceed. Substantial tax benefits to the State and Local Government will also be lost.

Biodiversity

The area lies in the Savana Biome (Eastern Kalahari Bushveld) in the Kathu Bushveld (SVk 12) as described by Mucina and Rutherford (2006).

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

Heritage and Cultural Resources

Dr. Edward Matenga has been appointed by Alet Maritz Mynbou (Pty) Ltd to compile a Heritage Impact Assessment in order to determine whether there are any areas of heritage and cultural importance (Appendix 5).

This Heritage Impact Assessment (HIA) report has been prepared in support of a prospecting application on the Farm Walton and two portions of the Farm Erith near Kathu under the Gamagara Local Municipality in the Northern Cape Province.

The Applicant, Alet Maritz Mynbou (Pty) Ltd, intends to mine diatomaceous earth, a mineral derived from fossilised algae deposits. This report has been prepared following a site visit and ground survey on 6 July 2021.

The findings of the study may be summarised as follows:

Stone Age
Low density traces were found on the western portion of the Erith comprising scrapers and flakes on the surface, described as background scatter. No finds were recorded on the farm Walton.

Iron Age
No sites or relics dating to the Iron Age period were recorded.

Burial grounds
No graves or burial grounds were reported on the property.

Conclusion and recommendations

In light of these findings, it is recommended that the mineral prospecting can go ahead. As a standard precaution, archaeological deposits are usually buried underground. If archaeological artefacts or skeletal material will be exposed in the area during construction, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.

Should any other heritage features and/or objects be located or observed, a heritage specialist will be contacted immediately. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that a heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. If the prospecting operation is approved, the heritage resources if any other had been encountered will be protected through the demarcation of no-go zones and fencing off.

ii) Details of the Public Participation Process Followed

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

The consultation process with interested and affected parties (neighbouring farmers and land owners) is ongoing for the Scoping Report that was submitted and consisted of the process below.

The process as described by NEMA for Environmental Authorisation was followed. See table 3 attached for the identification of Interested and Affected Parties to be consulted with. The landowner, and or occupants and direct neighbours were consulted. The landowners and neighbours were consulted with a registered letter informing them that the application had been accepted and a Scoping Report were attached in which all activities were explained.

The Scoping Report was put on disc and was distributed to all the registered parties per registered mail on 16 August 2021.

An Advert (Notice) was placed in the Kathu Gazette on 21 August 2021 to notify all other interested and affected parties.

The document was also made available at the public library in Kathu.

Site Notices were also placed on the gates at the entrance of the proposed prospecting site. Furthermore, a site notice was placed at the library in Kathu on 31 May 2021.

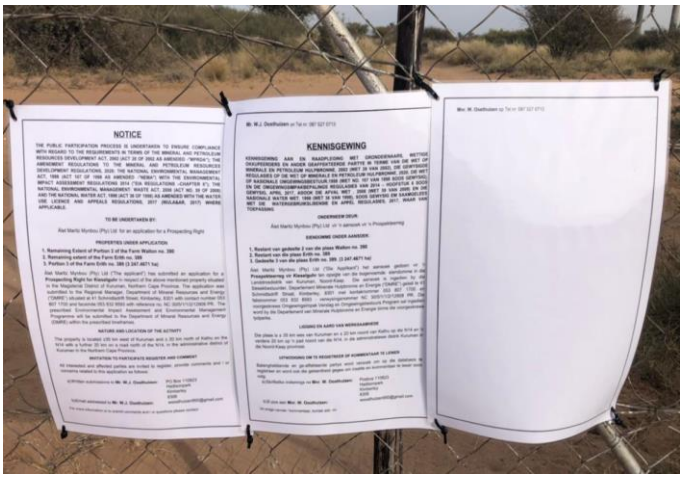

Photo 3: Notice that had been placed on the gate to the farm Walton.

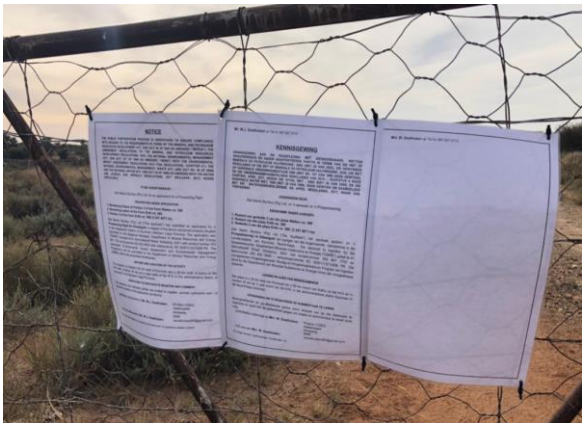

Photo 2: Notice that had been placed at the entrance to the remaining extent of the farm Erith.

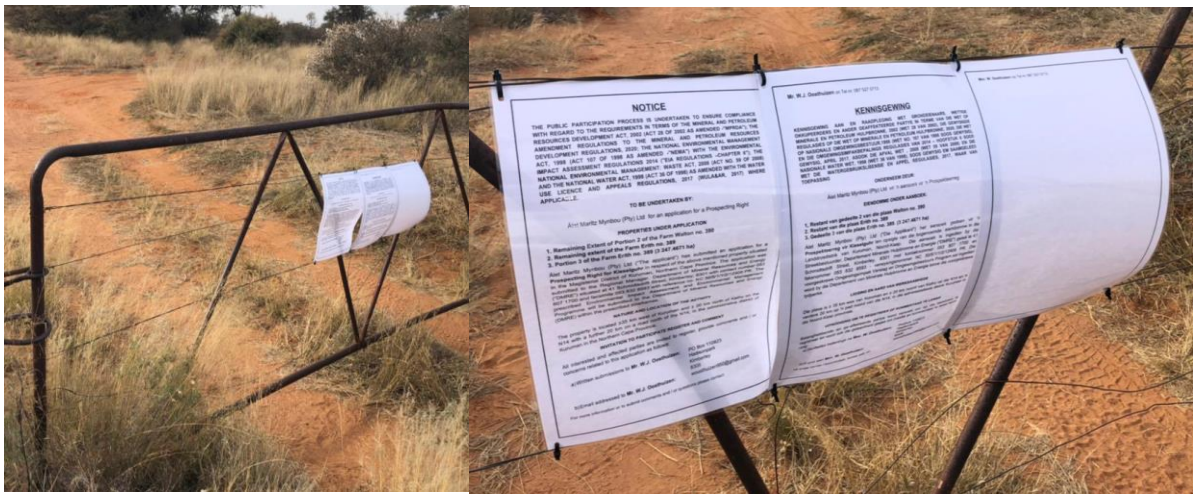

Photo 3: Notice that had been placed at the entrance to portion 3 of the farm Eirth.

Furthermore, a Public Meeting was held on 18 August 2021 at the NG Kerk in Kathu. An advert was placed in the Kathu Gazette (13 August 2021) notifying all interested and affected parties and emails were send to all registered interested and affected parties (10 August) of the meeting.

The EIA EMP document was also placed on a disc and send to all registered interested and affected parties by registered post or email for comments and concerns in October 2022.

The Environmental attributes associated with the development footprint alternatives (The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

(a) Type of environment affected by the proposed activity

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

(1) *GEOLOGY:*

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Alet Maritz Mynbou Pty Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area, geology was described and included in this report as part of the ecological study.

According to Coetsee (1979) the entire study area comprises Quaternary deposits in the form of red to flesh-coloured wind-blown sand (Figure 3). The kieselguhr deposits on both properties are however associated with alluvials that have not been formally mapped.

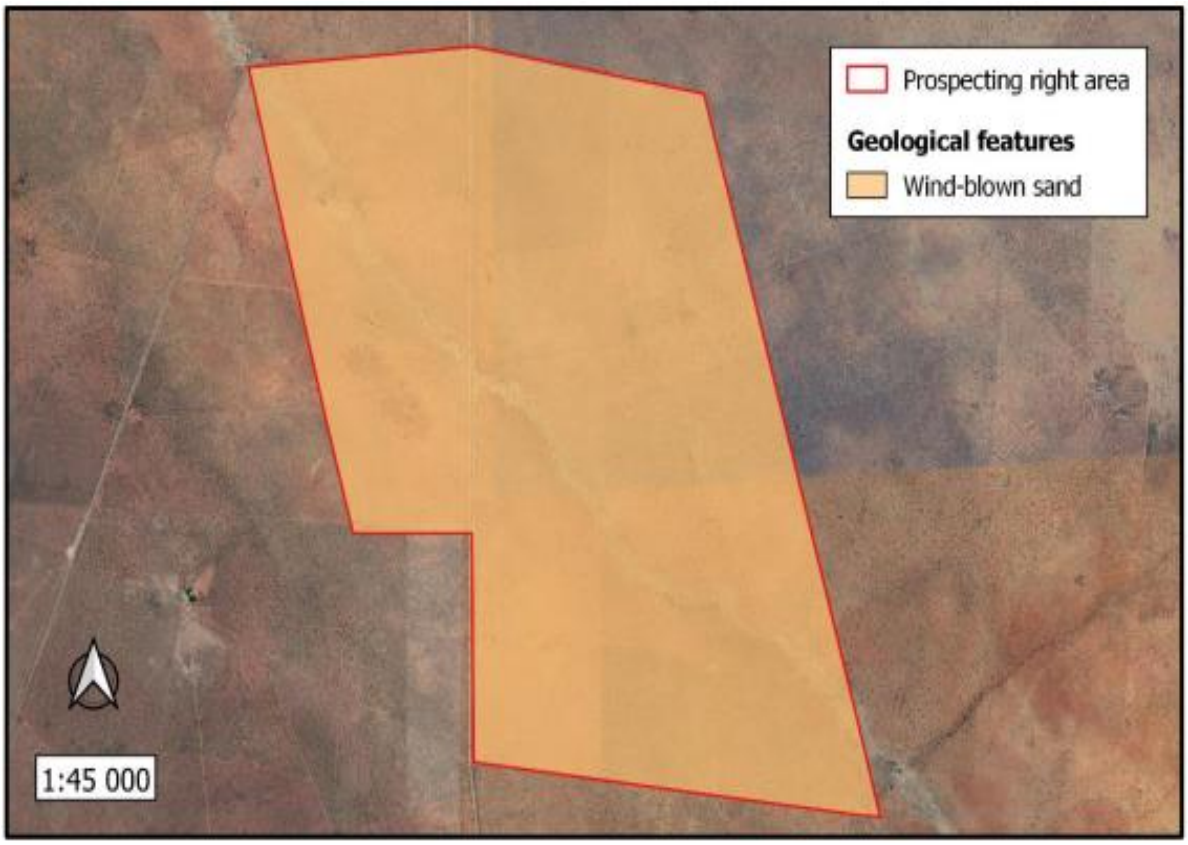

Figure 3. The distribution of geological features in the study area.

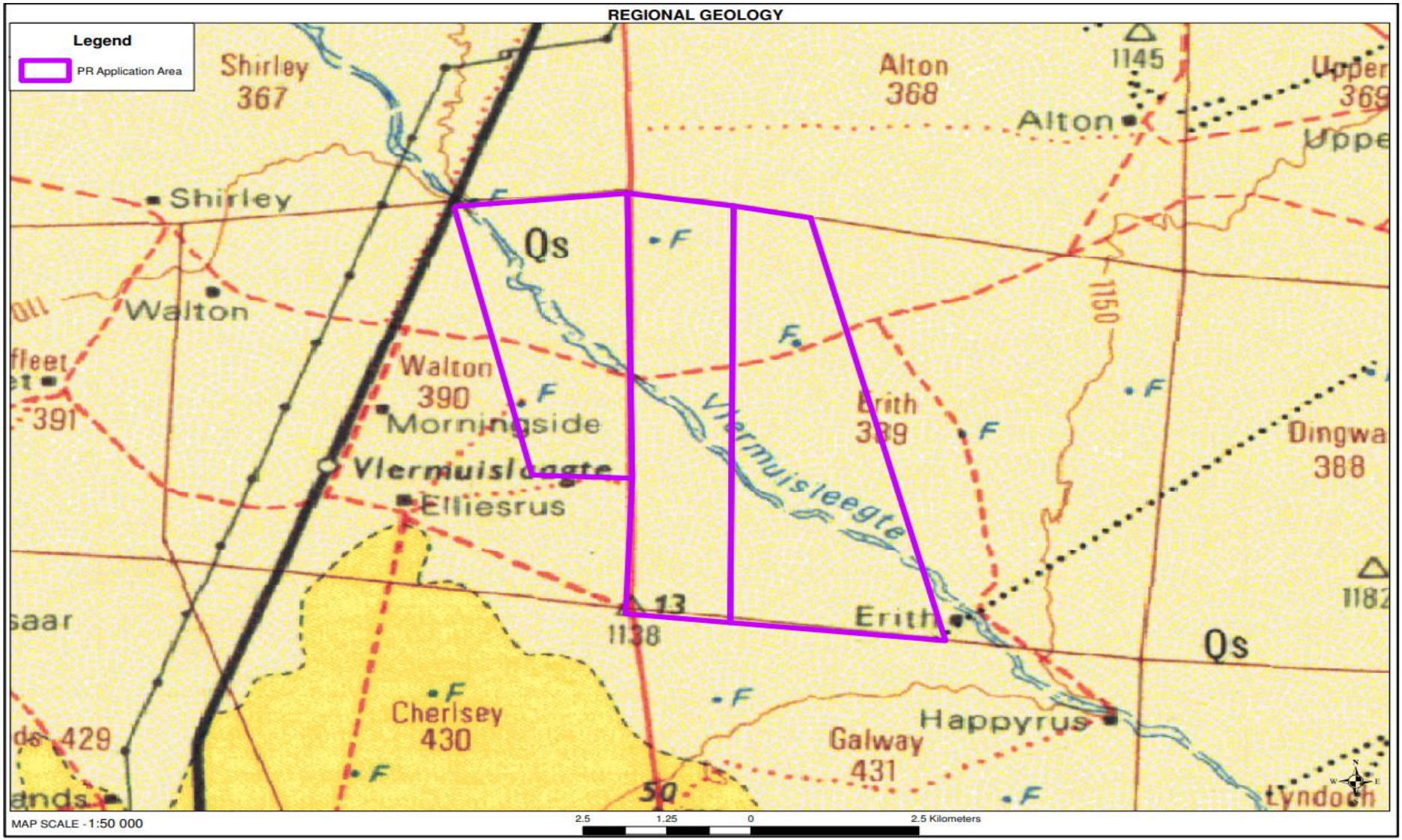

Figure 4. Map indicating the regional geology of the Prospecting right application area. Qs – Aeolian sand, flesh coloured;

Symbol	Group/Formation	Lithology	Approximate Age
Qs	Quaternary Kalahari sands	Aeolian sand, flesh coloured	Neogene, ca 2.5 Ma to present
Tl	Tertiary limestone	Surface limestone, sand, calcrete	Tertiary ca 65 – 5 Ma

(AHSA) Archaeological and Heritage Services Africa (Pty) Ltd has appointed Dr. Marion Bamford to conduct a desktop study and compile a Palaeontological Impact Assessment for the prospecting right application on the farms Walton and Erith, geology has been included in the report. The study can be found in Appendix 6.

The farms lie in the Griqualand West Basin of the Transvaal Supergroup. These underlying strata have a complex structure with a double plunging syncline so parts of the sequence are exposed to the north and south of this locality (Beukes et al., 2016). This central part is covered by the aeolian Kalahari sands so the depth and extent of the Hotazel Formation, that has bands of iron and manganese, cannot be determined from the surface.

The Late Archaean to early Proterozoic **Transvaal Supergroup** is preserved in three structural basins on the Kaapvaal Craton (Eriksson et al., 2006). In South Africa are the Transvaal and Griqualand West Basins, and the Kanye Basin is in southern Botswana. The Griqualand West Basin is divided into the Ghaap Plateau sub-basin and the Prieska sub-basin. Sediments in the lower parts of the basins are very similar but they differ somewhat higher up the sequences. Several tectonic events have greatly deformed the south western portion of the Griqualand West Basin between the two sub-basins

The Transvaal Supergroup comprises one of world's earliest carbonate platform successions (Beukes, 1987; Eriksson et al., 2006; Zeh et al., 2020). In some areas there are well preserved stromatolites that are evidence of the photosynthetic activity of blue green bacteria and green algae. These microbes formed colonies in warm, shallow seas.

These rocks represent on a very large scale, a sequence of sediments filling the basins under conditions of lacustrine, fluvial, volcanic and glacial cycles in a tectonically active region. The predominantly carbonaceous sediments are evidence of the increase in the atmosphere of oxygen produced by algal colony photosysnthesis, the so-called Great Oxygen Event (ca 2.40 – 2.32 Ga) and precursor to an environment where diverse life forms could evolve. The Neoarchean-Paleoproterozoic Transvaal Supergroup in South Africa contains the well-preserved stromatolitic Campbellrand - Malmani carbonate platform (Griqualand West Basin – Transvaal Basin respectively), which was deposited in shallow seawater shortly before the Great Oxidation Event (GOE).

Based on the early works of Leicester King, Partridge and Maud (1987, 2000) developed a model of three African Erosion Surfaces for southern Africa, from the Cretaceous to the Pliocene. During the Cretaceous Africa was very high, averaging about 2500-2000m above sealevel but the rifting apart of Gondwanaland and formation of the Atlantic and Indian Oceans, coastal erosion was rapid and the escarpment rapidly receded about 120km inland along the east and south coasts, but only 50km along the west coast. The newly exposed surface was called the African Erosion Surface. Their model has been challenged and modified by a number of researchers (Burke, 2011; Braun et al., 2014) who propose that mantle plumes caused uplift of the continent during the late Cretaceous, followed by erosion and further uplift about 30-20 million years ago, The newer interpretations have been followed here.

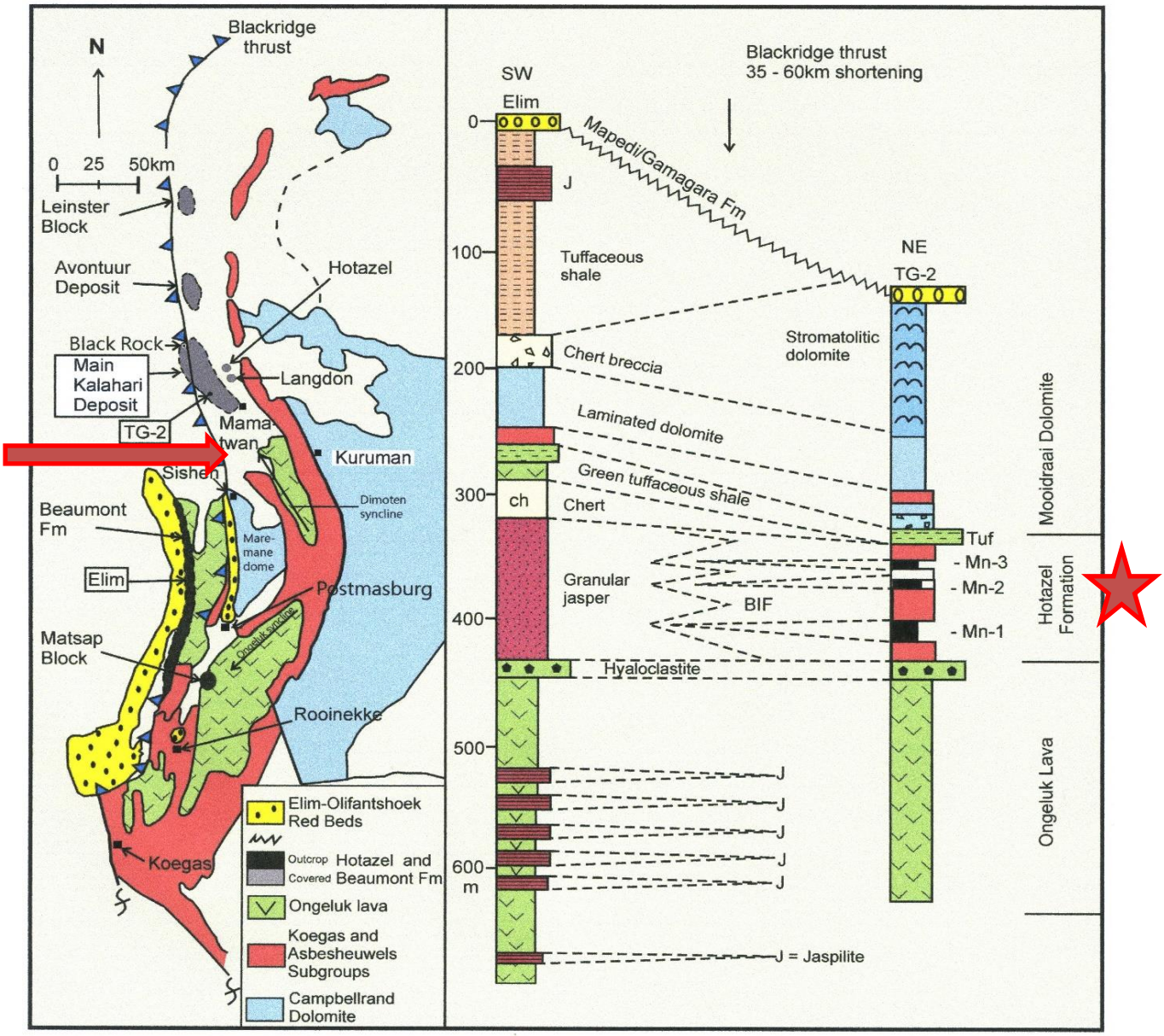

Figure 5. The Kalahari Manganese Field in the Griqualand Basin with the location of the Farm Walton indicated by the large red arrow. (Fig. 4 of Beukes et al., 2016).

Quaternary Kalahari sands overlie the whole farm. Haddon and McCarthy (2005) proposed that the Kalahari basin formed as a response to down-warp of the interior of the southern Africa, probably in the Late Cretaceous. This, along with possible uplift along epeirogenic axes, back-tilted rivers into the newly formed Kalahari basin and deposition of the Kalahari Group sediments began. Sediments included basal gravels in river channels, sand and finer sediments. A period of relative tectonic stability during the mid-Miocene saw the silcretisation and calcretisation of older Kalahari Group lithologies, and this was followed in the Late Miocene by relatively minor uplift of the eastern side of southern Africa and along certain epeirogenic axes in the interior. More uplift during the Pliocene caused erosion of the sand that was then reworked and redeposited by aeolian processes during drier periods, resulting in the extensive dune fields that are preserved today.

There are numerous pans in the Kalahari, generally 3–4 km in diameter (Haddon and McCarthy, 2005). According to Goudie and Wells (1995) there are two conditions required for the formation of pans. Firstly, the fluvial processes must not be integrated, and second, there must be no accumulation of aeolian material that would fill the irregularities or depressions in the land surface. Favoured materials or substrates for the formation of pans in South Africa are Dwyka and Ecca shales and sandstones (ibid).

Most pans in the Kalahari Basin are filled by a layer of clayey sand or calcareous clays and are flanked by lunette dunes formed as a result of deflation of the pan floor during arid periods (Lancaster, 1978a, b; Haddon and McCarthy, 2005). At some localities in the south western Kalahari spring-fed tufas have formed at the margins of pans during periods where groundwater discharge was high (Lancaster, 1986). These tufas may contain evidence of algal mats and stromatolites and may also be associated with calcified reed and root tubes (Lancaster, 1986).Many of the pans are characterised by diatomaceous earth, diatomite or kieselguhr, a white or grey, porous, light-weight, fine-grained sediment composed mainly of the fossilised skeletons of diatoms. Associated with some palaeo-pans and palaeo-springs are fossil bones, root casts, pollen and archaeological artefacts. Well-known sites are Florisbad and Deelpan in the Free State, Wonderkrater in Limpopo and Bosluispan in the Northern Cape. In in this region under study is the Kathu Complex.

(2) ***CLIMATE:***

Regional Climate

The Olifantshoek/Kathu area is characterised by an arid summer rainfall climate with an average annual temperature of 18.6°C and an average rainfall of 395mm falling predominantly in late summer (highest in March: 74mm). The driest month is July with only 3mm of precipitation. With an average temperature of 25.3°C, January is the warmest month,

whilst July is the coldest month with an average of 10.8°C (https://en.climate-data.org/africa/south-africa/northern-cape/kathu-27075/).

Rainfall

Monthly rainfall recorded at Kathu is presented in the figure 6 below. The highest rainfall was recorded in January, while July received the lowest amount of precipitation. The average annual rainfall recorded for the area is 390 mm.

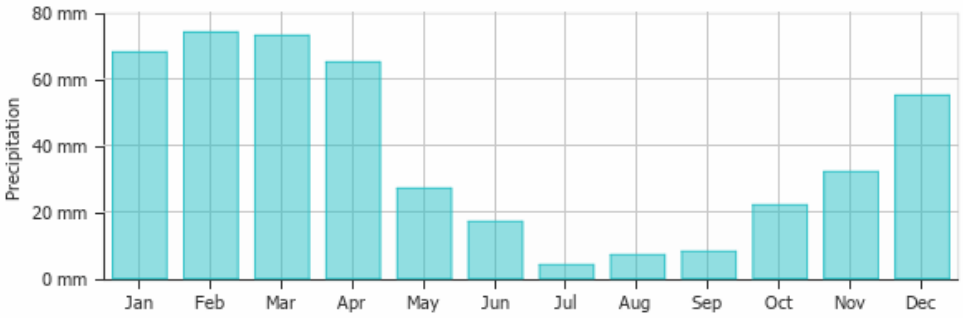

Figure 6. Monthly rainfall (mm) for Kathu (Source: Average monthly rainfall and snow in Kathu (Northern Cape), South Africa (millimeter) (weather-and-climate.com))

Temperatures

Monthly temperatures recorded at Kathu are presented in the table 4 below. November to March is the warmest, while June and July are the coldest.

Table 4: Temperatures recorded for Kathu (Source: Kathu, Northern Cape, ZA Climate Zone, Monthly Averages, Historical Weather Data (tcktcktck.org))

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec
Record high °C (°F)	40.99 (105.78)	39.04 (102.27)	37.09 (98.76)	34.16 (93.49)	32.21 (89.98)	26.35 (79.43)	26.35 (79.43)	31.23 (88.21)	36.11 (97.0)	39.04 (102.27)	39.04 (102.27)	39.04 (102.27)
Average high °C (°F)	33.79 (92.82)	32.81 (91.06)	31.48 (88.66)	26.6 (79.88)	23.76 (74.77)	19.28 (66.7)	19.35 (66.83)	21.58 (70.84)	25.76 (78.37)	28.84 (83.91)	31.13 (88.03)	32.98 (91.36)
Daily mean °C (°F)	30.22 (86.4)	29.45 (85.01)	27.92 (82.26)	23.06 (73.51)	19.82 (67.68)	15.04 (59.07)	15.0 (59.0)	16.88 (62.38)	21.36 (70.45)	24.79 (76.62)	27.17 (80.91)	29.18 (84.52)
Average low °C (°F)	22.13 (71.83)	22.22 (72.0)	21.0 (69.8)	17.01 (62.62)	13.87 (56.97)	9.06 (48.31)	8.55 (47.39)	9.36 (48.85)	12.77 (54.99)	15.62 (60.12)	17.42 (63.36)	20.08 (68.14)
Record low °C (°F)	11.71 (53.08)	11.71 (53.08)	10.74 (51.33)	5.86 (42.55)	2.93 (37.27)	-0.98 (30.24)	-1.95 (28.49)	0.0 (0)	2.93 (37.27)	2.93 (37.27)	5.86 (42.55)	9.76 (49.57)

Wind

The prevailing wind direction for Kathu is north-north-west. Average wind speed of up to 3.6 m/s for Kathu can be expected. The strongest wind speeds can generally be expected during the early summer months.

Incidents of Extreme Weather Conditions

Thunderstorms and hail

Hail is sometimes associated with thunderstorms and mainly occurs in early to late summer (November to February). Although thunderstorms can occur around 27 days per year, hail only occurs on average three times a year. These storms may sometimes be severe and cause much damage, but they usually only impact on a relatively small area.

Frost

The period during which frost can be expected lasts for about 120 days (May to August). With extreme minimum temperatures to below -8 °C at night in the winter, frost development can be severe.

Droughts:

Droughts are common and may vary from mild to severe. During these periods dust storms sometimes occur, depending mainly on denudation of the surface.

Wind

High winds are unusual and the highest wind speeds recorded for the region are around 90 km/hr, which occur once or twice a year. At these speeds, the winds are classified as whole gale winds. When they occur, they can uproot trees and take off roofs.

(3) TOPOGRAPHY:

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Alet Maritz Mynbou Pty Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area, topography was described and included in this report as part of the ecological study.

The topography of the study area is characterised by flat to gently undulating plains, with altitudes between 1 106 and 1 135 m above sea level. The terrain is therefore indicated by a very gentle slope of < 1 %.

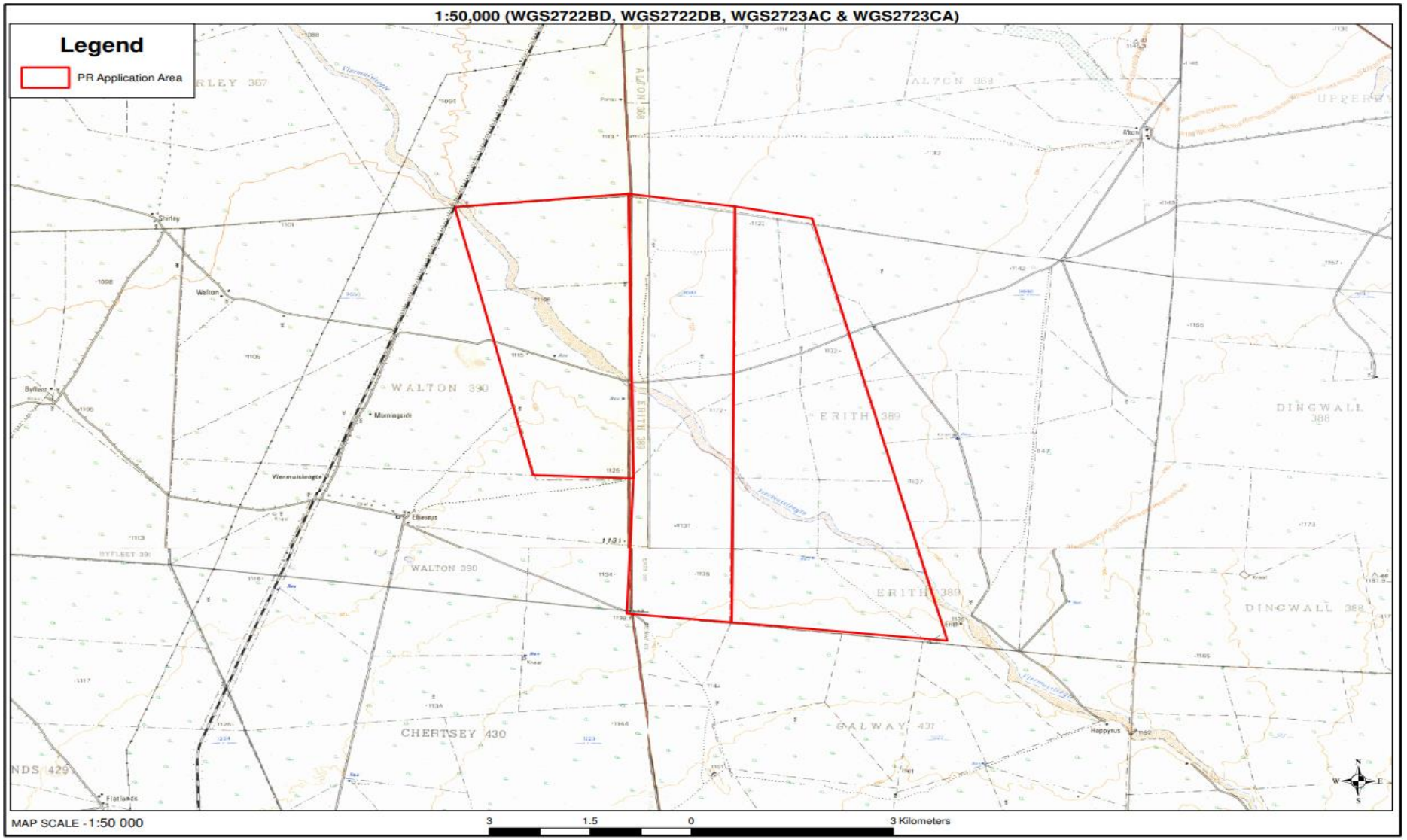

Figure 7. Topographical Map indicating the prospecting right application area in red.

(4) ***SOILS:***

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Alet Maritz Mynbou Pty Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area, soil was described and included in this report as part of the ecological study.

Land types found on the property include Ag110 and Ah9 (Figure 8). Almost the entire study area is associated with red-yellow apedal, freely drained soils (red and yellow), with a high base status and usually contains less than 15% clay (Ah9). Along the south-western corner of the prospecting right boundary, it transitions to red-yellow apedal, freely drained soils (red), with a high base status and is less than 300 mm deep (Ag110).

The generally level to gently sloping land of the plains produces low water erosion risk, but because the soils are primarily sandy, the wind erosion risk is increased significantly after disturbances to the natural vegetation cover. If badly eroded, the soils have a low potential to regenerate.

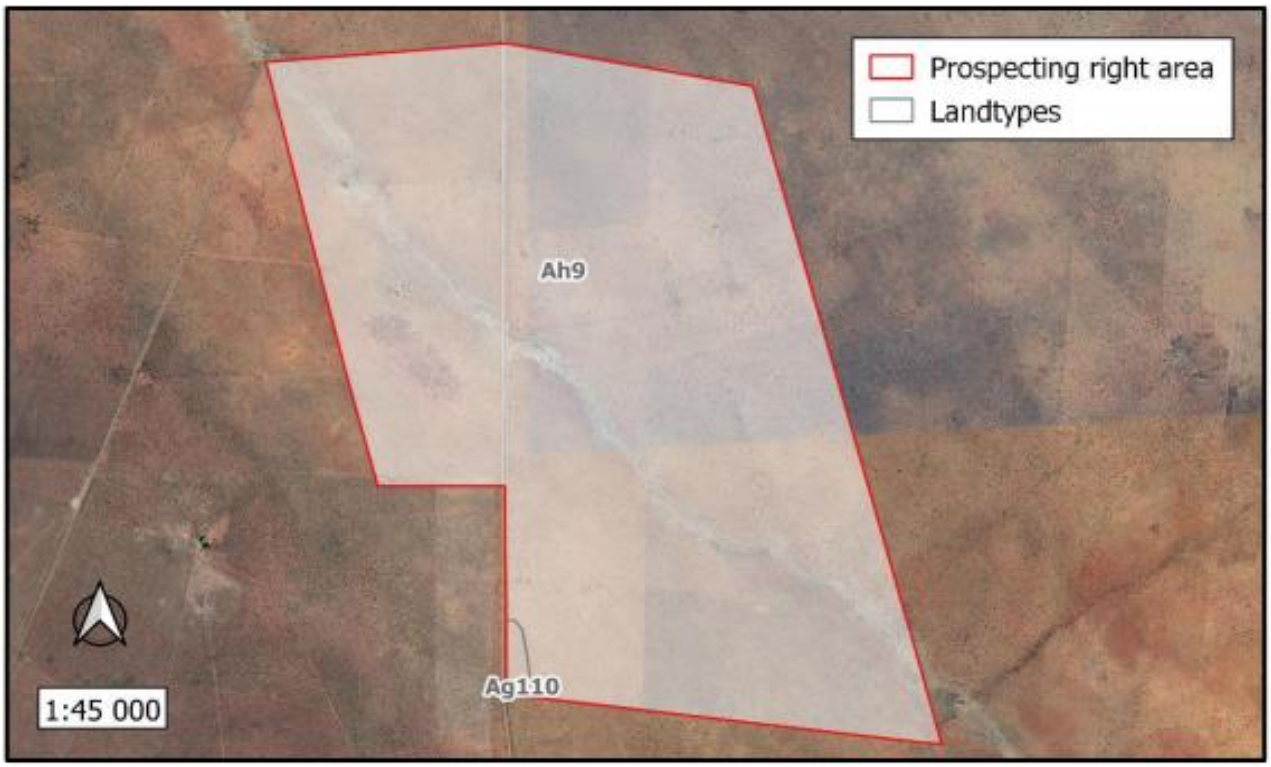

Figure 8. The distributions of land types in the study area

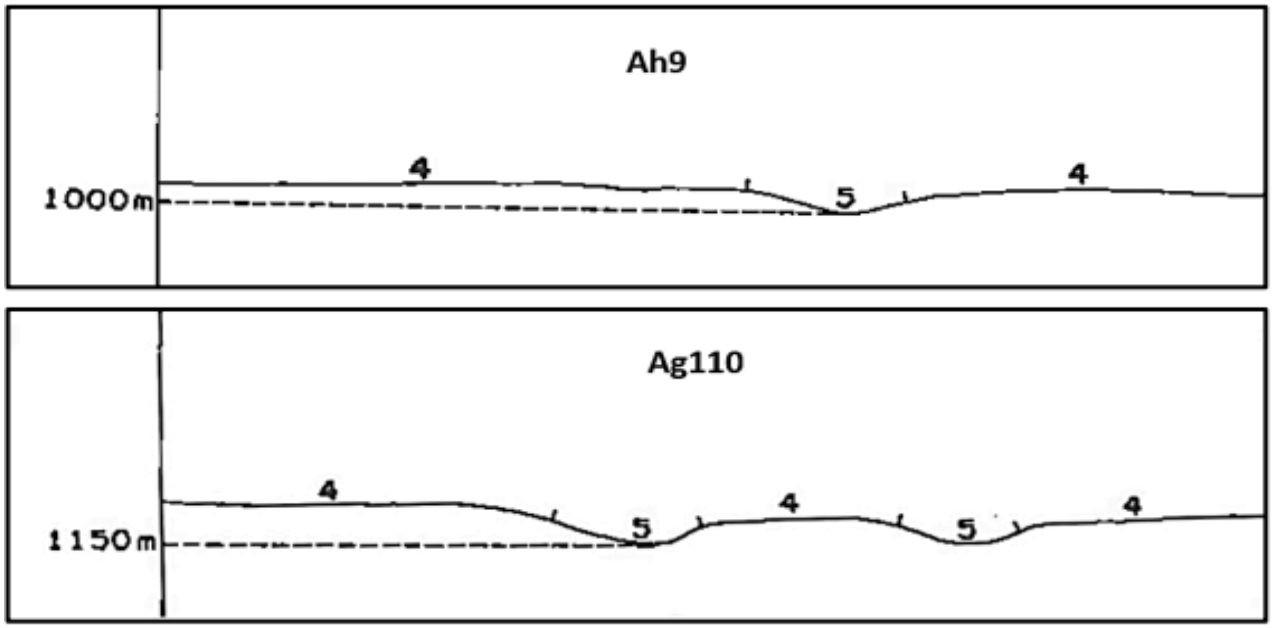

Figure 9. The distribution of land types in the study area, along with their terrain form sketches.

(5) *LAND CAPABILITY AND LAND USE:*

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Alet Maritz Mynbou Pty Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area, land capability and land use was described and included in this report as part of the ecological study. (Appendix 4).

The major land uses in the region include activities related to agriculture, hunting and mining. The land capability of the study area is non-arable, with moderately low potential for grazing and wildlife. The agricultural region is demarcated for cattle farming, with the grazing capacity estimated at 11 Ha/LSU. The study area is not suitable for crop irrigation. Currently, the farms are utilised as natural pastures for domestic livestock. A few small-scale historic diggings and old fields are also present. Existing infrastructure include roads, homesteads, and farm buildings (Figure 10). A provincial road dissects the study area, and it is currently being upgraded, with a road construction site established on Erith.

Currently, the farms are primarily utilised as natural pastures for domestic livestock. Some areas have been subjected to small-scale historic diggings and irrigation. Existing infrastructure include roads, homesteads, farm buildings and dams.

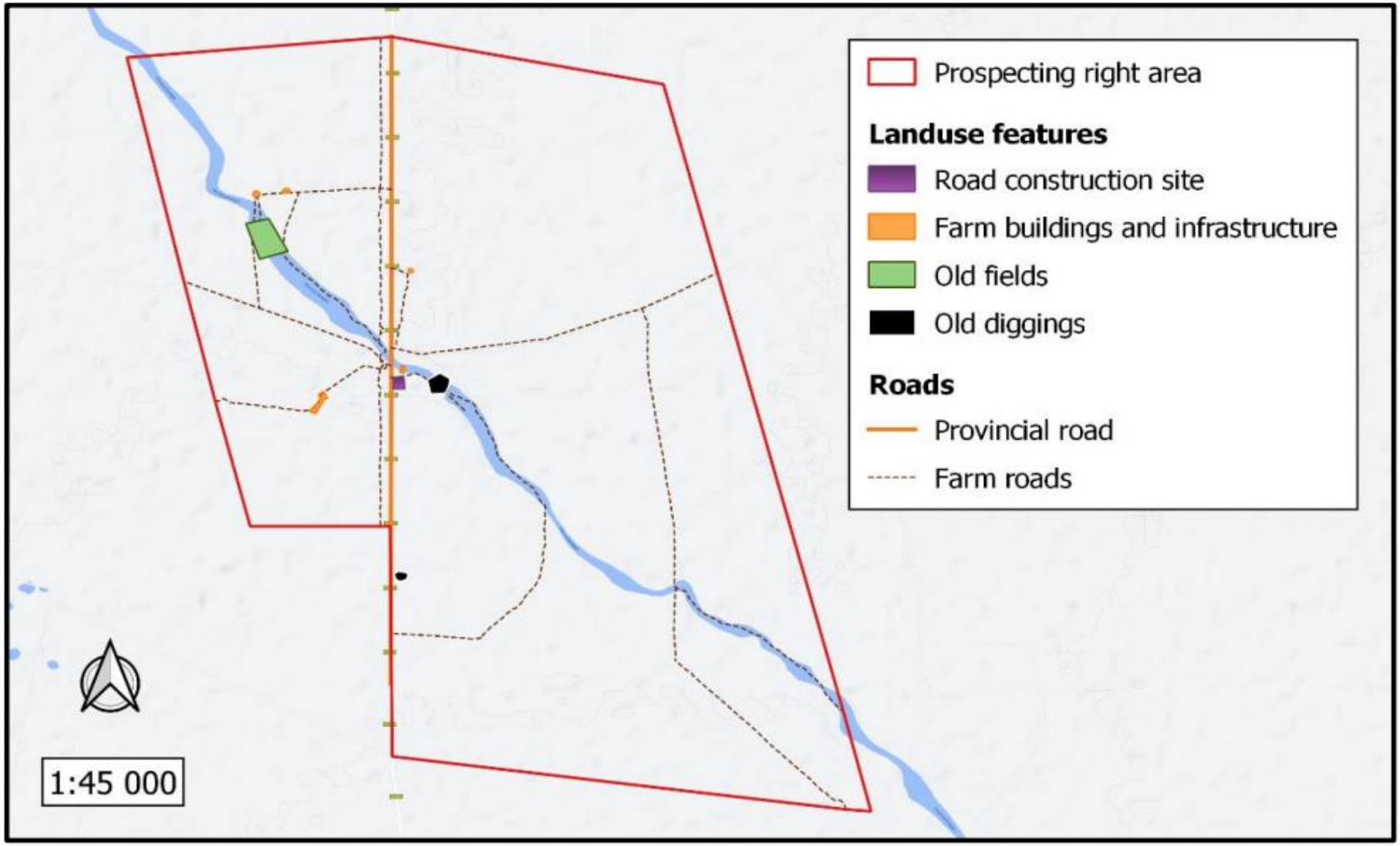

Figure 10. The existing land use features on the prospecting right area.

(6) *NATURAL FAUNA:*

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Alet Maritz Mynbou Pty Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area, natural fauna was described and included in this report as part of the ecological study. (Appendix 4).

This ecological assessment report attached as Appendix 4 describes the ecological characteristics of the proposed prospecting area, identifies the source of impacts from prospecting, and assesses the impacts, as well as the residual impacts after closure.

According to Section 3(a) and 4(a) of the Northern Cape Nature Conservation (NCNCA) Act No. 9 of 2009, no person may, without a permit by any means hunt, kill, poison, capture, disturb, or injure any protected or specially protected animals. Furthermore, Section 12 (1) of NCNCA states that no person may, on a land of which he or she is not the owner, hunt a wild animal without the written permission from the landowner. The landscape features in the study area does not provide diverse habitat opportunities to faunal communities, but the vegetation and sandy substrate provide many micro habitats. Animals likely to be found in the study area are discussed in their respective faunal groups below.

Mammals

As many as 54 terrestrial mammals and seven bat species have been recorded in the region. Of these, six terrestrial mammal species and two bat species are listed either according to the IUCN or South African Mammal Red List. The two listed bat species, Ground Pangolin, African Striped Weasel, South African Hedgehog and Black-footed Cat have a high chance of occurring across the site, given their wide habitat tolerances or preference for savanna habitats. Leopard and Brown Hyaena have a low potential to be found on site mainly since farm fences are restricting their occurrences across their natural distribution range, and they are also persecuted by livestock farmers.

Virtually all mammals of the study area are protected; either according to Schedule 1, 2 or 3 of NCNCA. Apart from the red listed species already discussed above, those that are specially protected include Aardvark, Cape Fox, Bat-eared Fox, Honey Badger, Striped Polecat, Aardwolf, and African Wild Cat. These all have an affinity for open woodland or savanna and therefore a high likelihood to occur on site.

The sandy substrate of the study area provides ample habitat for fossorial mammals and their presence was signified through many burrows observed during the field survey. Damara Mole-rat mounds were also observed in the woodland on red sand.

Problem animals with a high likelihood to occur on site include Black-backed Jackal and Caracal.

Reptiles

The proposed prospecting area lies within the distribution range of at least 46 reptile species (see Appendix 2), of which none are red listed. However, most are protected either according to Schedule 1, 2 or 3 of NCNCA (see Appendix 2). Specially protected species (Schedule 1) include Chamaeleo dilepis dilepis (Common Flap-neck Chameleon), Karusasaurus polyzonus (Southern Karusa Lizard) and Python natalensis (Southern African Python). The Southern Karusa Lizard has a low likelihood to be found on site due to their preference for dolerite rock outcrops. The Southern African Python is associated with a variety of habitats but prefers riverine or rocky areas and therefore also does not have a high likelihood to be found on site. The Namaqua Chameleon, however, has a high chance of occurring on site. They occur in a variety of habitats and is expected to be found high up in shrubs or trees. The only South African endemic known from the region is Acontias gracilicauda (Thin-tailed Legless Skink). It is fossorial and usually found in moderately mesic soils in open or partly wooded habitats up to 1 600 m.a.s.l.

Amphibians

Ten amphibian species are known from the region (Appendix 2), of which none are red listed. However, all amphibians of the study area are protected according to Schedule 2 of NCNCA (see Appendix 2). One South African endemic, i.e., Vandijkophrynus gariepensis (Karoo Toad) is known from the region. It is adapted to a wide variety of terrestrial habitats and breeds in different types of permanent and temporary waterbodies. It therefore could potentially be found on site, but their presence will only be evident during summer in places where rainwater collects. Similarly, any pool or stream formed after large rainfall events are expected to attract most of the remaining frog species for breeding. However, the Bushveld Rain Frog is independent of water and is expected to be found across the study area. Those species that are dependent on perennial waters, i.e., Common Platanna and Common River Frog are not expected to occur on site.

Avifauna

The study site does not fall within or near (< 150 km) any of the Important Bird Areas (IBA) defined by Birdlife South Africa. A total number of 267 bird species have been recorded from the region (see Appendix 2), of which 28 are listed

either in the IUCN or South African Red Data Book of Birds. Furthermore, all birds are protected either according to Schedule 1, 2 or 3 of NCNCA.

Among these bird species of conservation concern, those with a high affinity for open woodland habitat, i.e. Martial Eagle, Tawny Eagle, Bateleur, Lanner Falcon, Red-necked Falcon, Red-footed Falcon, White-backed Vulture, Lappet-faced Vulture, Kori Bustard, Roller and Owl species, have the highest likelihood to occur on site, either by occasionally passing over, foraging or nesting.

None of the protected water birds (i.e., Chestnut-banded Plover, Storks, Black-winged Pratincole, Maccoa Duck, Lesser Flamingo and Greater Flamingo) or high-altitude rock associated species (Verreaux's Eagle, African Rock Pipit and Cape Vulture) are expected to occur on site.

Fish

In addition to those regulations in the NCNCA pertaining to wild animals, Section 32 and 33 of the NCNCA states that no person may, without a permit angle and not immediately release, catch, import, export, transport, keep, possess, breed, or trade in a specimen of a specially protected (Schedule 1) or protected (Schedule 2) fish.

No fish are expected to occur in Vlermuisleegte, even when flowing, mainly due to their ephemerality. Therefore, no fish species are expected to occur on site.

Invertebrates

Invertebrates dominate inland habitats and play a significant role in the overall function of the ecosystem (Kremen et al. 1993; Weisser and Siemann 2004). In general, they are widely distributed and extremely diverse, which makes it almost impossible to list all species that may possibly occur on site without a dedicated monitoring programme. Invertebrates have also not been surveyed as comprehensively as plants and mammals and therefore current available data on their distribution is much scarcer. Nevertheless, key morphospecies and species of conservation concern are discussed here, as well as the major habitats which delimit possible invertebrate communities on site.

Seventeen invertebrate species of the Northern Cape appear on the IUCN Red Data list of threatened species. Of these, one species, i.e., Anthene lindae, Linda's Hairtail (Near Threatened) is known from the study region and could potentially occur on site. The adult butterflies are usually found on sparsely scattered Vachellia erioloba trees, which is believed to be the larval host plant.

In addition, those species that are specially protected according to Schedule 1 of the NCNCA include all Velvet worms as well as some baboon spider species, Stag Beetles and the Flightless Dung Beetle. Of these, Common Baboon

Spiders (Harpactira baviana) have been recorded in the region and could potentially also be found on site. It prefers arid and semi-arid grassland and is found under stones, generally in shallow excavations but sometimes in short burrows a few centimetres deep.

All Rock- Creeping- and Burrowing Scorpions are protected according to Schedule 2 of the NCNCA, along with several beetles, butterflies and moths. Of these, several burrowing scorpions (Opistophthalmus fitzsimonsi, O. carinatus, O. wahlbergii, and O.pluridens), Monster Tiger Beetles (Manticora sp.), Gossamer-winged Butterflies, Skippers, Brush-footed Butterflies and Satyrs have been recorded in the region and have a high
likelihood to be found on site.

One major habitat delimits possible invertebrate communities in the study area, i.e., Bushveld for insect preference (Picker et al. 2004). Species associated with this habitat type are diverse and are widely distributed. The study area itself is expected to host high invertebrate richness and density, due to the diverse micro habitat opportunities on site. Insect activity during the field survey was limited by the state of the vegetation, but Community Nest Spiders (Stegodyphus sp.) were common across the site.

(7) FLORA:

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consulting has been appointed by Alet Maritz Mynbou Pty Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area, natural flora was described and included in this report as part of the ecological study. (Appendix 4).

Broad-scale vegetation patterns

The study area falls within the Savanna Biome (Mucina and Rutherford 2006). According to the vegetation map of Mucina and Rutherford (2012), the site is represented by one broad-scale vegetation unit, i.e. Kathu Bushveld (Figure 11).

Kathu Bushveld is found in the Northern Cape on plains from Kathu and Dibeng (south), through Hotazel, to the Botswana border between Van Zylsrus and McCarthysrus (north). It occurs at altitudes between 960 and 1 300 m, with the vegetation presented as open savanna. *Vachellia erioloba* and *Boscia albitrunca* are dominant trees, while *Senegalia mellifera, Diospyros lycioides* and *Lycium hirsutum* are important shrubs. The geology comprises aeolian red sand and surface calcrete, with deep sandy soils of Hutton and Clovelly forms. The unit is considered least threatened, with none being statutorily conserved. More

than 1% of this unit has been transformed mainly through mining, but erosion is very low.

Figure 11. The broad-scale vegetation units (Mucina and Rutherford 2012) present in the study area. (Map taken out of the Ecological study by Dr. B Milne, 2022)

Fine-scale vegetation patterns

Plant communities in the study area are delineated according to plant species correspondences and changes in soil structure. Two distinct units have been identified (Figure 12) and although they share very similar species, their species composition and soil structure are different. Community descriptions below include unique characteristics and the dominant species found in each unit. A complete plant species list, including those species likely to occur here is presented in Appendix 1.

i) **Vachellia erioloba - Stipagrostis uniplumis woodland on alluvium**
This community is associated with Vlermuisleegte (Figure 12) and although it occurs on alluvium, its species composition does not correspond to those typically found in ephemeral streams. This could be due to historic land use practises or might indicate that the alluvium was a result of paleochannel deposits. Light-coloured sand intermixed with calcareous soil constitutes about 10 % of the ground cover. The vegetation is presented as a woodland where trees, specifically Vachellia erioloba dominates the tall woody layer, while the grassland matrix is dominated by Stipagrostis uniplumis.

Apart from the dominant species, other common tall shrubs and trees scattered across the unit include Vachellia haematoxylon, V. hebeclada, Senegalia mellifera and Grewia flava. Prosopis glandulosa has also extensively invaded this community. Low shrubs found in the grassland matrix include Aptosimum marlothii, A. albomarginatum, Chrysocoma ciliata, Justicia incana, Pentzia calcarea, Melolobium calycinum, Peliostomum leucorrhizum, and Salsola sp.

The grassy matrix grows densely, but due to the condition of the veld during the time of the survey, it was difficult to identify all grass species present. Apart from the dominant species, Eragrostis rigidior is also very common. Other grasses include Aristida congesta ssp. congesta and Eragrostis lehmanniana. Herb species include Hermannia tomentosa, H. abrotanoides, Senna italica.

ii) **Vachellia haematoxylon - Eragrostis rigidior woodland on red sand**

This community comprises most of the study area (Figure 12) and due to land use practices, its species composition and distribution patterns is patchy. Here, red sand constitutes about 20 % of the ground cover and it is presented as a woodland with primarily medium-sized trees scattered in a grassy matrix (Figure 12). Tall trees also occur patchily.

The medium-tall woody layer is dominated by Vachellia haematoxylon, but Senegalia mellifera is also very common. It is further occupied by Vachellia erioloba, Terminalia sericea, Diospyros lycioides, Grewia flava and Gymnosporia buxifolia. Low shrubs include Asparagus exuvialis, Aptosimum marlothii, Justicia incanum and Pentzia calcarea.

The grass layer is well developed but was in poor condition during the field survey. Species include Eragrostis rigidior, Aristida congesta subsp. congesta, Stipagrostis uniplumis, Aristida meridionalis, Centropodia glauca and Schmidtia pappophoroides. Herbs include Hermannia tomentosa and Senna italica.

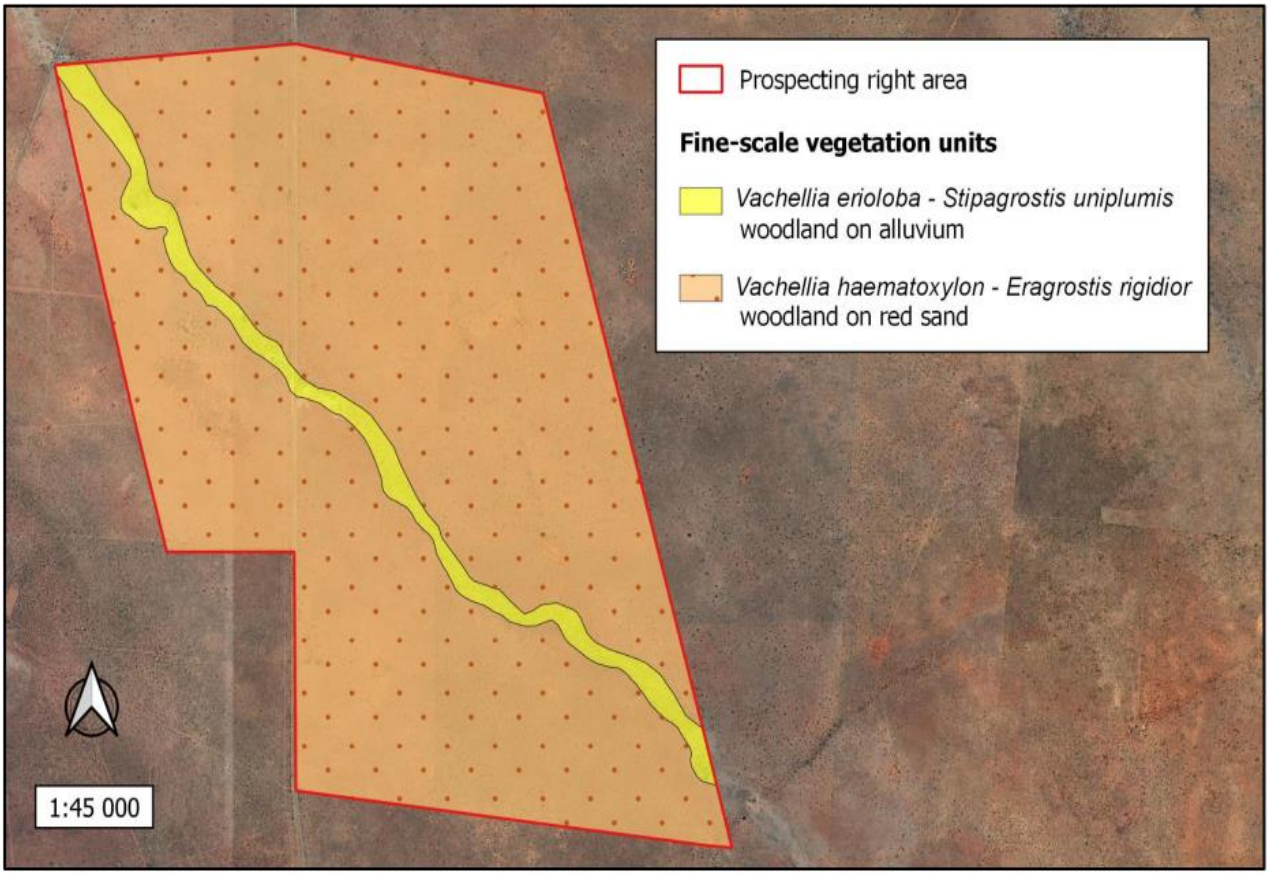

Figure 12. The expected distribution of proposed fine-scale plant communities in the study area. (Map taken out of the Ecological study by Dr. B Milne, 2021)

Population of sensitive, threatened, and protected plant species

The SANBI Red List provides information on the national conservation status of South Africa's indigenous plants, while the National Forests Act (No. 84 of 1998) (NFA) and the Northern Cape Nature Conservation Act (Act No. 9 of 2009) (NCNCA) restricts activities regarding sensitive plant species. Section 15 of the NFA prevents any person to cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister. Section 49 (1) and 50 (1) of the NCNCA statesthat no person may, without a permit pick, transport, possess, or trade in a specimen of a specially protected (Schedule 1) or protected (Schedule 2) plants. Furthermore, Section 51(2) states that no person may, without a permit, pick an indigenous plant (Schedule 3) in such manner that it constitutes large-scale harvesting.

All species recorded in the area are classified as least concern; a category which includes widespread and abundant taxa. Species protected in terms of the National Forests (NFA) Act No 84 of 1998 include Vachellia erioloba and V. haematoxylon. They are associated with both plant communities on site but occur at different densities in each.

Vachellia haematoxylon occurs at higher densities in the woodland on red sand (± 10 individuals per hectare), compared to the woodland on alluvium (± 4 – 8 ind/ha). On the other hand, V. erioloba is more abundant in the woodland on alluvium (± 10 ind/ha) compared to the woodland on red sand (< 1 ind/ha). Across the site, V. haematoxylon is predominantly found as small (1 m (h) x 80 cm - 1 m (d)) to medium-sized (1 - 2 m (h) x 1 cm - 2 m (d)) trees and shrubs, but trees up to 3 m in height are also present. Vachellia erioloba is represented across its size range, i.e., saplings (30 cm (h) x 40 cm (d)), young trees (1 - 2 m (h) x 80 cm - 1 m (d)), and large adult trees (3 - 4 m (h) x 6 - 8 m (d)).

To damage or remove any of these protected trees (seedlings to adults) an application must be submitted to the Northern Cape Department of Agriculture, Forestry and Fisheries (DAFF) and a licence obtained from DAFF at least three months prior to such activities.

Protected species in terms of Schedule 1 and 2 of the Northern Cape Nature Conservation (NCNCA) Act No. 9 of 2009 is listed in Table 4 of the ecological study. Gymnosporia buxifolia occurs at low densities in the woodland on red sand, but none of the remainder species were recorded during the survey. Harpagophytum procumbens subsp. procumbens and Lessertia frutescens subsp. frutescens (Schedule 1) is known from the region, and both have a high likelihood to occur in the woodland on red sand. Similarly, the bulb species, Lapeirousia littoralis (Schedule 2) is likely to be found in the woodland on alluvium but will only be visible in the rainy season.

In addition to those protected species listed above; according to Section 51(2) of NCNCA, a permit is required from the Northern Cape, Department of Environment and Nature Conservation (DENC) for any large-scale clearance of all indigenous (Schedule 3) vegetation, at least three months before such activities commence.

Weed and invader plant species

Weeds and invasive species are controlled in terms of the National Environmental Management: Biodiversity (NEMBA) Act 10 of 2004, the Conservation of Agricultural Resources (CARA) Act 43 of 1993, as well as the NCNCA (Schedule 6). These are species that do not naturally occur in a given area and exhibit tendencies to invade that area, and others, at the cost of locally indigenous species. To govern the control of such species, NEMBA and CARA have divided weeds and invader species into categories (see Table 5).

Table 5. The categorisation of weeds and invader plant species, according to NEMBA and CARA.

NEMBA		CARA	
1a	Listed invasive species that must be combatted or eradicated.	**1**	Plant species that must be removed and destroyed immediately. These plants serve no economic purpose and possess characteristics that are harmful to humans, animals and the environment.
1b	Listed invasive species that must be controlled.	**2**	Plant species that may be grown under controlled conditions. These plants have certain useful qualities and are allowed in demarcated areas. In other areas they must be eradicated and controlled.
2	Listed invasive species that require a permit to carry out a restricted activity within an area.	**3**	Plant species that may no longer be planted. These are alien plants that have escaped from or are growing in gardens and are proven to be invaders. No further planting is allowed. Existing plants may remain (except those within the flood line, 30 m from a watercourse, or in a wetland) and must be prevented from spreading.
3	Listed invasive species that are subject to exemptions and prohibitions		

Table 6. A list of declared weeds and invasive species recorded in the study area.

Scientific name	Common name	CARA	NEMBA	NCNCA
Prosopis glandulosa var. *glandulosa*	Honey mesquite	2	3	S6

Indicators of bush encroachment

Bush encroacher species are controlled in terms of Regulation 16 of CARA; where land users of an area in which natural vegetation occurs and that contains communities of encroacher indicator plants are required to follow sound practices to prevent the deterioration of natural resources and to combat bush encroachment where it occurs. Declared indicators of bush encroachment in the Northern Cape, which were recorded in and around the study area, are listed in Table 7.

Table 7. A list of declared indicators of bush encroachment in the Northern Cape recorded in the study area.

Scientific name	Common name
Euclea undulata	Common Guarri
Grewia flava	Velvet Raisin
Senegalia mellifera	Black thorn
Tarchonanthus camphoratus	Camphor Bush
Terminalia sericea	Silver Cluster-leaf
Vachellia karroo	Sweet Thorn

(8) *SURFACE WATER*

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The National Water Act (36 of 1998) (NWA) provides a framework to protect water resources. According to this Act, a water resource includes a watercourse, surface water, estuary, or aquifer; whereas a water course includes:

a) a river or spring,
b) a natural channel in which water flows regularly or intermittently,
c) a wetland, lake or dam into which, or from which, water flows, and
d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse.

Any reference to a watercourse includes its bed and banks and a water resource does not only include the water within the system, but also the entire water cycle, i.e., evaporation, precipitation, the habitats and processes.

The purpose of this Act (Section 2) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors - (g) protecting aquatic and associated ecosystems and their biological diversity and (h) reducing and preventing pollution and degradation of water resources. No activity may take place within a watercourse unless it is authorised by the Department of Water and Sanitation (DWS). Any area within a wetland or riparian zone is therefore excluded from development unless authorisation is obtained from DWS in terms of Section 21 (c) and (i).

The study area falls within the Molopo quaternary catchment D41K of the Lower Vaal Water Management Area. It has been allocated a Present Ecological State (PES) of 'largely natural' (B) by Delport and Mallory (2002) and information regarding mean annual rainfall, evaporation potential and runoff for this quaternary catchment is provided in Table 8.

Table 8. Catchment characteristics for the Molopo quaternary catchment in which the study area falls, as presented by Delport and Mallory (2002)

Quaternary catchment	Catchment Area (km^2)	Mean Annual Rainfall (mm)	Mean Annual Evaporation (mm)	Mean Annual Runoff (10^6 m^3)
D41K	4 216	344	2 350	4.43

According to the South African Inventory of Inland Aquatic Ecosystems (SAIIAE), the study area falls within the Eastern Kalahari Bushveld Bioregion, where 1.3 % of the land area is covered by inland wetlands, including depressions, floodplains, seeps and valley-bottom wetland types (Van Deventer et al. 2019). The spatial extent according to the SAIIAE present ecological status per wetland type is depicted in Table 9. Depressions are most abundant in the bioregion, with the majority in natural or near-natural condition. The remaining wetland types have been moderately to severely modified.

Table 9. Percentage of inland wetland spatial extent according to the present ecological status per wetland type of the Eastern Kalahari Bushveld Bioregion.

Wetland type	Total Extent (%)	% Natural or near-natural (A/B)	% Moderately modified (C)	% Heavily to severely/critically modified (D/E/F)
Depression	57.1	70.5	5.7	23.8
Floodplain	2.2	0.6	48.8	50.5
Seep	17.2	10	15.1	75
Valley-bottom	23.5	0.9	29.6	69.5

The study area comprises one ephemeral river identified by SAIIE, i.e., Vlermuisleegte. It is moderately modified according to NFEPA and threatened according to SAIIAE. Its channel runs through the prospecting right area from the south-east to the north-western corner. The R380 cuts through it and the road construction site has also been established in its channel. No information is available on its hydrology.

Water resource delineation and classification

One river, i.e., Vlermuisleegte was identified on site. The gradual slopes of the plains terrain obscured the presence of drainage lines and therefore no drainage lines were delineated. Vlermuisleegte is indicated in Figure 13, along with its local upslope catchment and a minimum GIS buffer of 200 m. Vlermuisleegte covers a total length of ± 42 km, of which 21 % (9 km) falls within the boundaries of Walton and Erith. It originates ± 17 km to the south-east of the site, with its upstream catchment comprising a total area of ±244km2

(Figure 13). Hydrogeomorphic Unit (HGMU) classification is described below. It is found on plains terrain. The HGMU was classified up to Level 6.

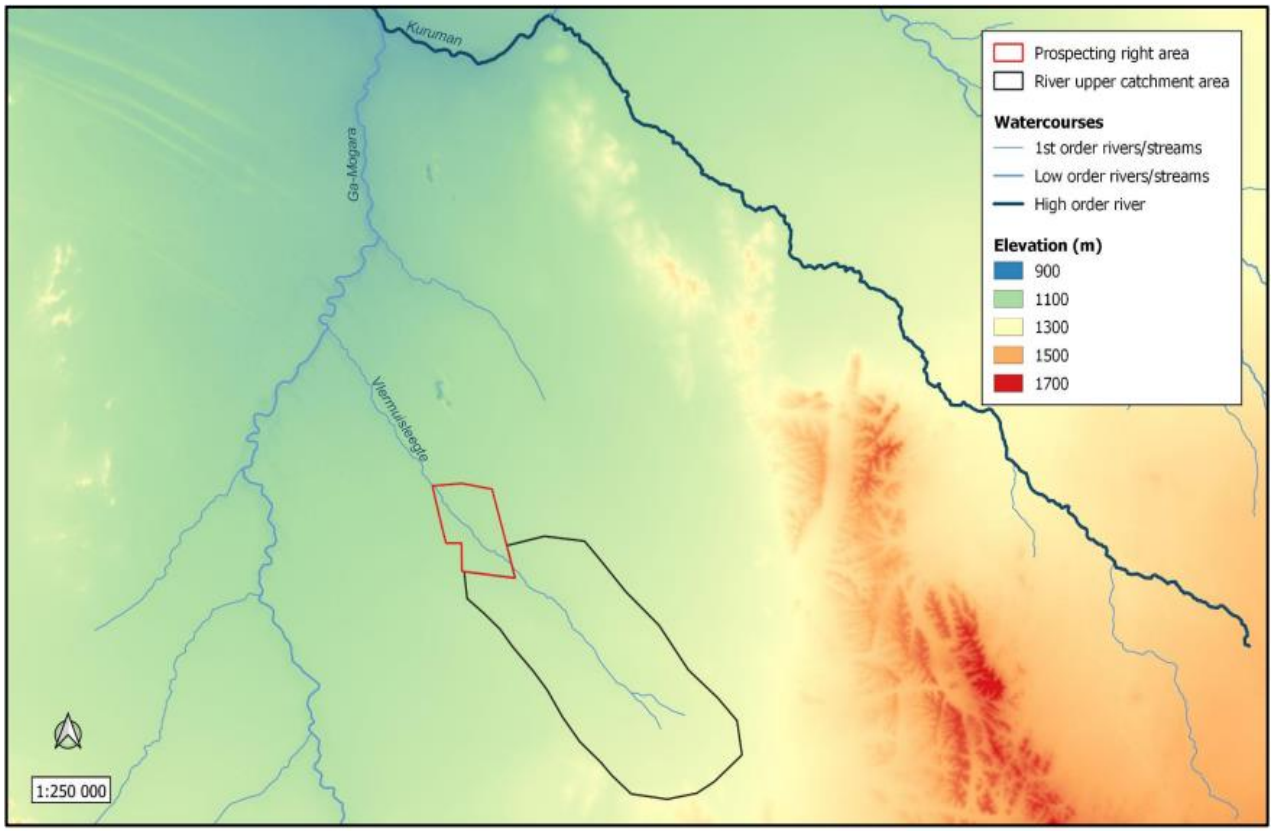


Figure 13. Vlermuisleegte originates ± 17 km to the south-east of Walton and Erith and merges downstream with Ga-Mogara, before it eventually flows into the Kuruman River further north.

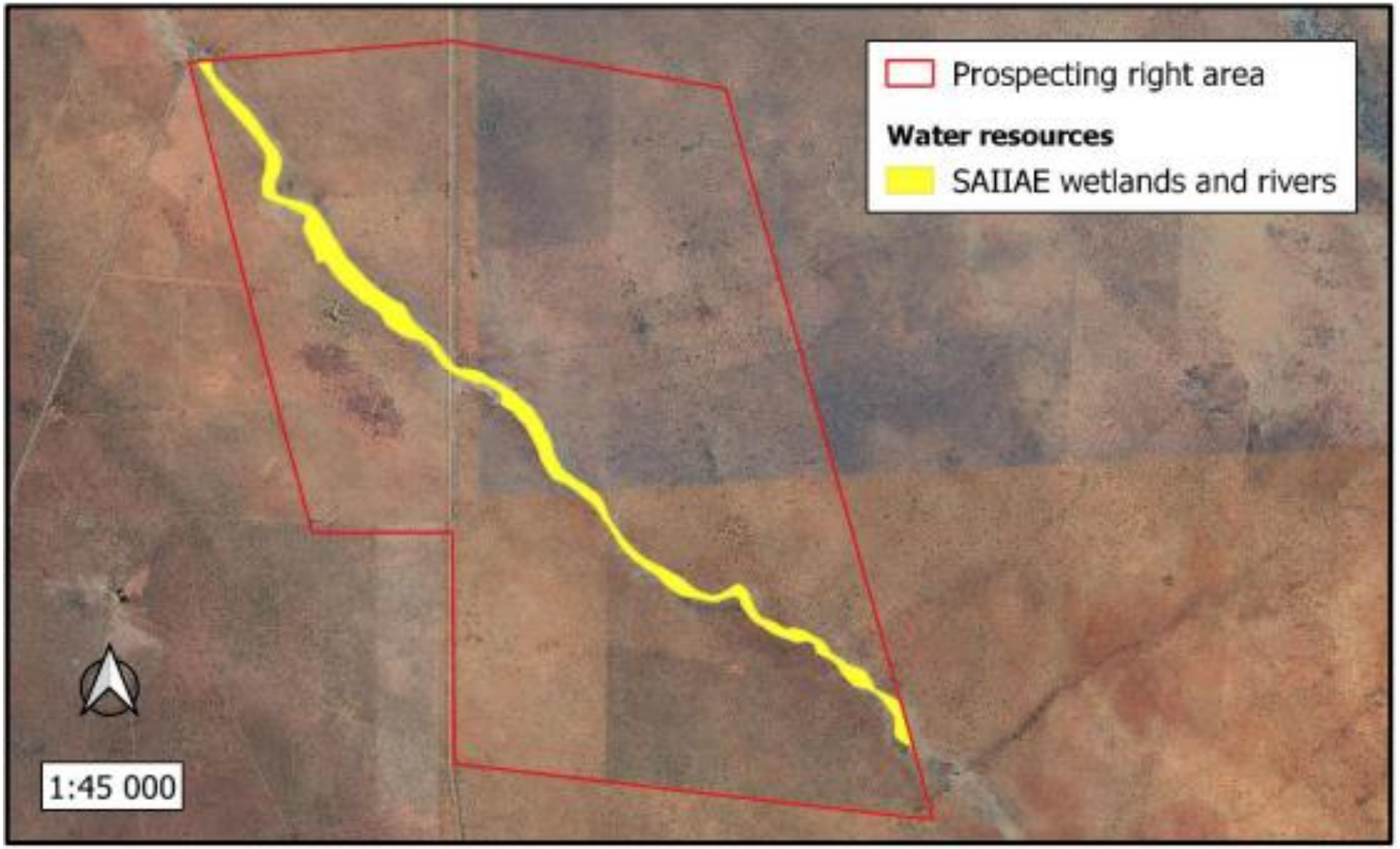


Figure 14. The location of water resources on the proposed prospecting right area.

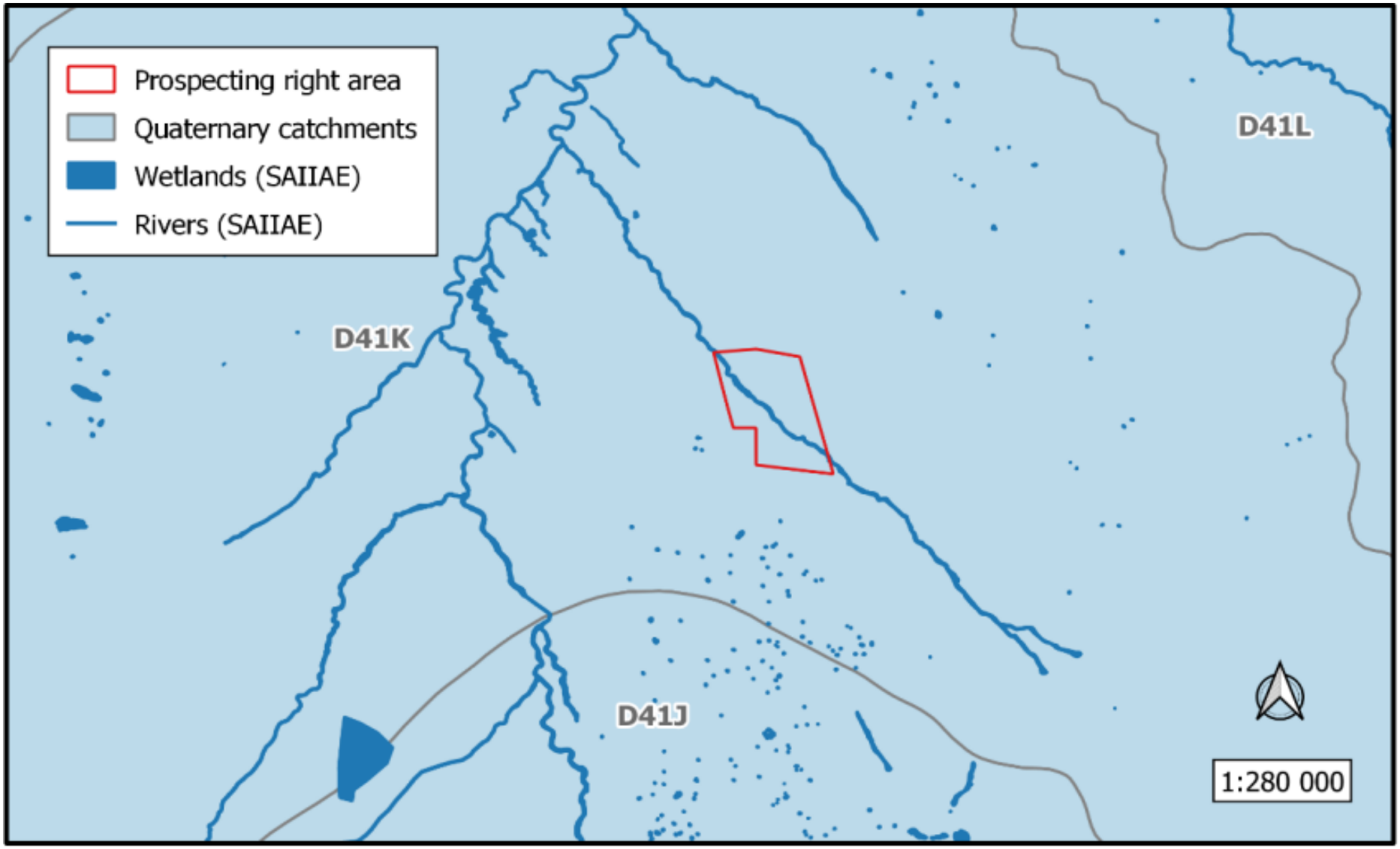


Figure 15. The locality of the proposed prospecting area in relation to the quaternary catchments of the Lower Vaal Water Management Area.

HGMU1: LOWLAND RIVER

Vlermuisleegte is classified as a natural lowland river, with an active channel cutting through a low gradient landscape. A conceptual illustration of a river, according to Ollis et al. (2013) is presented in Figure 16. The hydrology of Vlermuisleegte is unknown, but it is expected to only carry water after substantial summer rainfall events. It is therefore non-perennial and intermittent. This hydrological regime limits quantitative baseline information on the water quality associated with the river. The soil is also only intermittently saturated, and the soil does not show any soil wetness indicators. The substratum primarily comprises sand, but calcrete gravel is also present. Biological crusts also occur sporadically across the surface. The river channel is predominantly vegetated, comprising indigenous species. The vegetation form is best described as an open woodland, dominated by trees, shrubs, and grasses, although forbs are also present. No aquatic or riparian vegetation is present.

Present Ecological Status Assessment

The PES of Vlermuisleegte is based on an instream habitat integrity assessment only since no riparian zone is present. According to the pre-development assessment, Vlermuisleegte is moderately modified (PES C) with a IHI of 76.4 %, i.e., loss and change of natural habitat and biota have occurred, but the basic ecosystem functions are still predominantly unchanged. The post-development assessment decreased the IHI to 71.2 %, but the PES remains at moderately modified (PES C). These assessments were completed with medium confidence, primarily due to the ephemerality of the system. Based on evidence of physical alterations to the beds and banks of the river, the connectivity has been most affected. The ephemeral character of Vlermuisleegte provided for a low impact score in terms of physio-chemical and hydrological modifications. Refined landcover categories within Vlermuisleegte and its 500m buffer are depicted in Figure 16, while Figure 17 indicates landcover for the total upstream catchment area from the study site.

The most significant direct modifications have occurred in the form of general surface disturbances through the construction of roads, and associated burrow pits, that cut through the river channel, altering its connectivity, natural geomorphology, and hydrologic regime.

Agricultural practices, including old fields and grazing camps, have also caused surface disturbances, potentially decreasing flows during flooding events, causing loss in connectivity and potentially increasing sedimentation risks.

Indirect, external impacts have been caused by upstream impeding structures (water holes, earth berms, roads, and farm buildings) that have been built across the river, intercepting flood waters and adding to erosion risks and sedimentation impacts.

The current state of the hydrology, physio-chemical character, beds- and bank conditions and connectivity are expected to deteriorate slightly due to the proposed prospecting activities. The prospecting activities will increase the severity of the impacts through modifications to the beds and banks of the river, which will decrease the integrity of the instream habitat. However, it will not affect the overall PES of Vlermuisleegte primarily due to its small-scale and local effects.

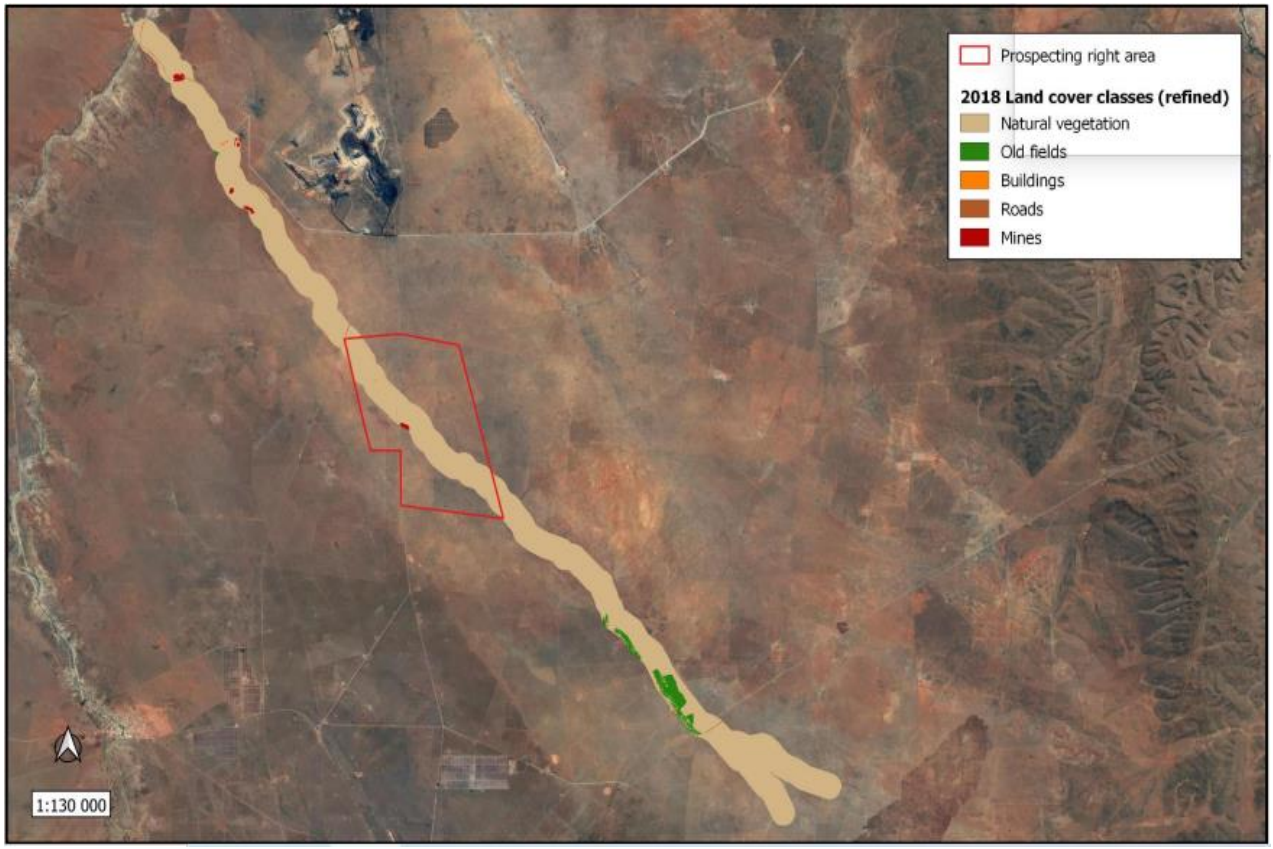


Figure 16. Refined landcover categories and disturbance units in Vlermuisleegte and its 500m buffer.

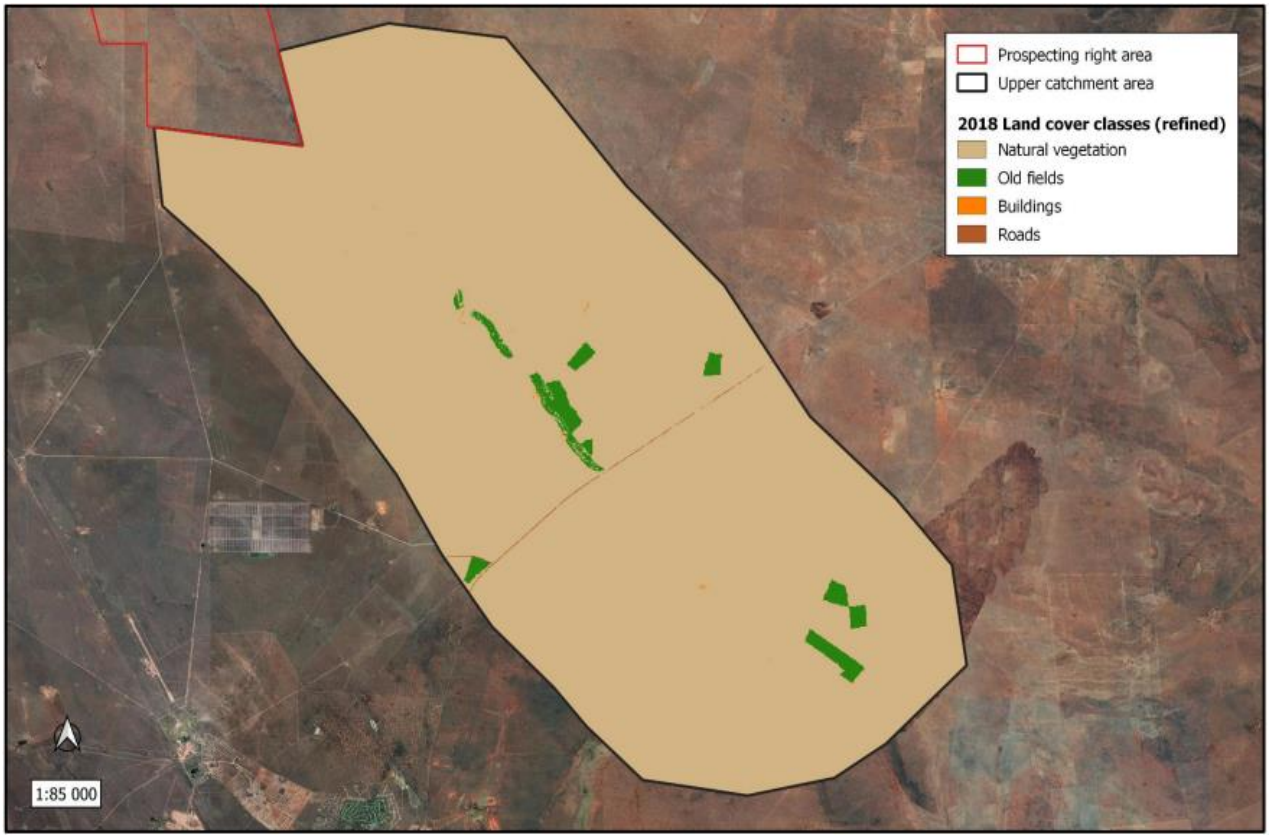


Figure 17. Refined landcover categories in the total upstream catchment of Vlermuisleegte from Walton and Erith.

Ecological Importance and Sensitivity

Vlermuisleegte was rated to have Low EIS and is therefore not considered to be unique at any scale or very sensitive. It provides suitable habitat for the nationally protected trees Vachellia erioloba and V. haematoxylon as well as the provincially protected Nerine laticoma and Oxalis lawsonii. These are however terrestrial species that are not restricted to the beds and banks of Vlermuisleegte. No population of unique biota are known to be restricted to the river habitat, but the artificial pools created along the beds of Vlermuisleegte might host specialised Branchiopods. No biota is expected to be dependent on flowing water and the species richness is not regarded significant at any scale.

Furthermore, Vlermuisleegte does not have a high diversity in aquatic habitat types or features. Its ability to provide refugia to biota during periods of environmental stress is mainly significant in terms of terrestrial species on a local scale. The habitat of Vlermuisleegte is not considered to be sensitive to flow decreases or increases, or water quality changes primarily based on its strong ephemerality. Vlermuisleegte is also not of any importance in terms of connectivity for the survival of biota upstream and downstream.

On the other hand, all watercourses are protected under the National Water Act and Vlermuisleegte is considered an Ecological Support Area (Northern Cape Critical Biodiversity Areas) and has Very High sensitivity according to the Aquatic Biodiversity Theme (Environmental Screening Tool), since it falls within a strategic Water Source area for groundwater. These factors reflect the importance for the conservation of ecological diversity at a national scale. For this reason, Vlermuisleegte has been considered to have high protected status, even though it is still currently being poorly protected.

Recommended buffer zone

The aquatic buffer segment identified for Vlermuisleegte (Figure 18) has gentle sloping land and sandy textured soils with high permeability. The river's buffer requirements are low in general, due to Vlermuisleegte being a first order low land river, the arid climate of the region, the high pH buffering capacity linked to the calcareous soil and moderately robust vegetation with good interception potential. The final aquatic impact buffer requirement is 17 m, which is based on a pre- and post-mitigation assessment, mainly since core prospecting activities are planned to take place in the river itself and therefore the threats remain the same, even with mitigation.

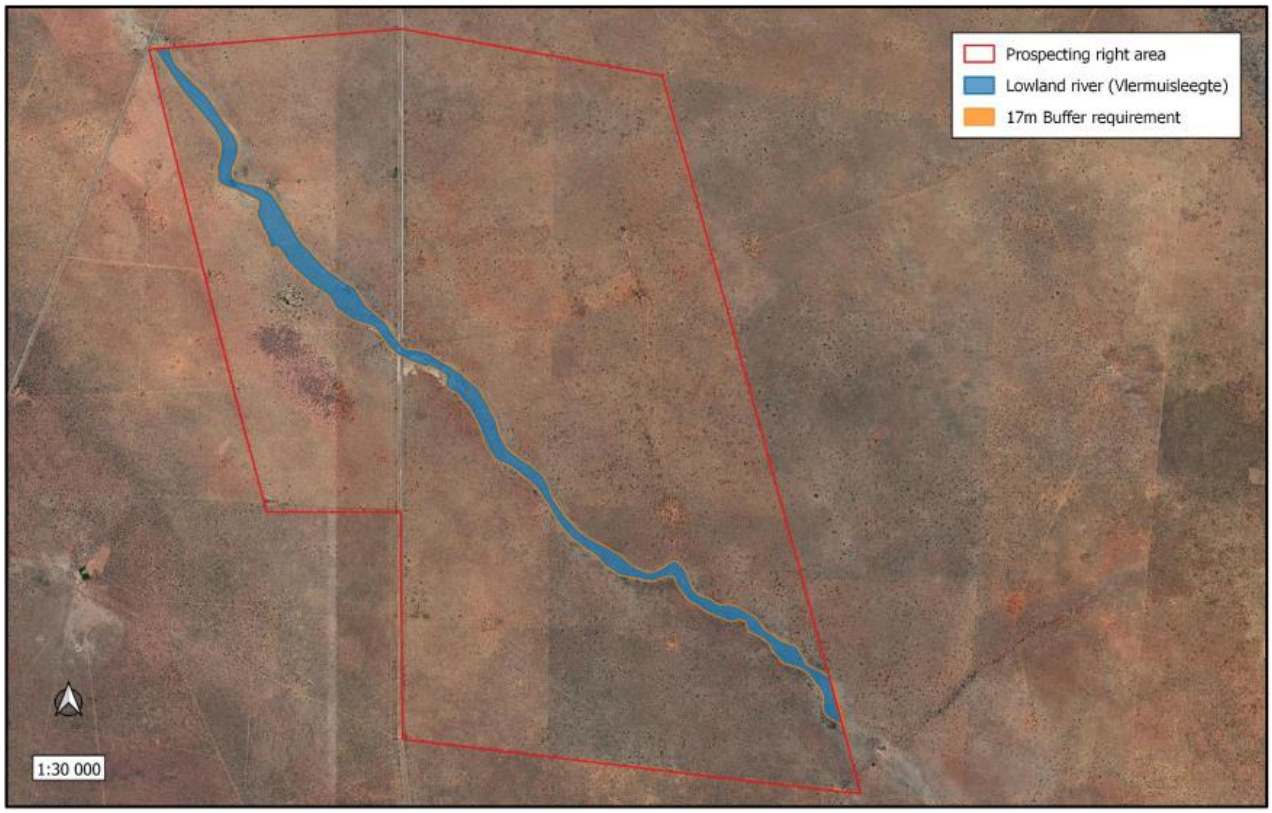


Figure 18. Final aquatic impact buffer requirements, including practical management considerations, for Vlermuisleegte.

(9) ***GROUND WATER:***

"GROUNDWATER UTILIZATION IS IMPORTANT IN THE AREA AND CONSTITUTES THE ONLY SOURCE OF WATER OVER MUCH OF THE RURAL AREAS WITHIN THE ENVIRONMENTAL MANAGEMENT FRAMEWORK AREA. AS A RESULT OF THE LOW RAINFALL OVER THE AREA, THE GROUNDWATER IS MAINLY USED FOR RURAL DOMESTIC WATER SUPPLIES, STOCK WATERING AND WATER SUPPLIES TO INLAND TOWNS. RECHARGE OF GROUNDWATER IS LIMITED AND ONLY SMALL QUANTITIES CAN BE ABSTRACTED ON SUSTAINABLE BASIS. AQUIFER CHARACTERISTICS (BOREHOLE YIELDS AND STORAGE OF GROUND WATER) ARE ALSO TYPICALLY UNFAVORABLE BECAUSE OF THE HARD GEOLOGICAL FORMATION UNDERLYING MOST OF THE MUNICIPAL AREA" (SIYANDA EMF, 2008: 24).

Ground-water use:
At present ground water supplies drinking water to the game and livestock present on the application area.

Ground-water zone:
The kieselguhr prospecting does not affect the quality of the ground water in any manner. There are no harmful or toxic properties in the kieselguhr being mined. No water is needed for the kieselguhr prospecting.

(10) ***AIR QUALITY AND NOISE:***

With reference to the Scheduled processes under the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965): No scheduled process relates to any proposed prospecting activity on the farm.

Existing sources
The current source of air pollution in the area stems from numerous mining operations within the area (manganese mines and from vehicles traveling on the gravel roads of the area).

New source
The source of air pollution on the farm will be nuisance dust generated by the opencast bulk sampling process if drilling was positive, as well as from the movement of trucks and vehicles on the prospecting roads. Gas emissions from machinery will be within legal limits.

Areas of impact

The prevailing wind direction for Kathu is north-north-west. Average wind speed of up to 3.6 m/s for Kathu can be expected. The strongest wind speeds can generally be expected during the early summer months, there is a potential for fall-out dust to impact on the surrounding farm properties – which can be described as the nearest potential area of impact. The dust management programme recommended should include daily dosing of access roads and stockpile areas if bulk sampling is reached during the prospecting project.

A complain register for surrounding owners and the community will be kept on site and the management of dust would be guided by these additionally comments of public.

Noise

Existing sources:

Noise on site will come from the large vehicles (ADT trucks, front-end loader, back actor).

There are numerous mining operations in the vicinity of the proposed prospecting operation.

The impact would be of more importance regarding the direct worker environment that should adhere to the requirements in terms of the Mine Health and Safety Act. These noise levels will be continuous and the operators will be issued with earplugs.

Noise is normally encountered during the normal operation hours at the prospecting operation. Prospecting vehicles are limited between 7am and 5pm every day during the week. Noise levels will be monitored on the prospecting area and where necessary, protective equipment is used in certain areas where machinery is used.

(11) *VISUAL ASPECTS:*

If bulk sampling is reached the negative visual impacts associated with open bulk sampling sites will be present, although it will however have a low negative impact since it will only be visible to the landowners. There is however no method of reducing the impact during prospecting operations (operational phase), it can only be mitigation by doing concurrent rehabilitation of open excavations as prospecting progress.

(12) AREAS OF CULTURAL-HISTORICAL OR ARCHAEOLOGICAL INTEREST

Dr. Edward Matenga has been appointed by Alet Maritz Mynbou (Pty) Ltd to compile a Heritage Impact Assessment in order to determine whether there are any areas of heritage and cultural importance (Appendix 5).

This Heritage Impact Assessment (HIA) report has been prepared in support of a mine prospecting application on the Farm Walton and two portions of the Farm Erith near Kathu under the Gamagara Local Municipality in the Northern Cape Province.

The Applicant, Alet Maritz Mynbou (Pty) Ltd, intends to mine diatomaceous earth, a mineral derived from fossilised algae deposits. This report has been prepared following a site visit and ground survey on 6 July 2021.

The findings of the study may be summarised as follows:

Stone Age
Low density traces were found on the western portion of the Erith comprising scrapers and flakes on the surface, described as background scatter. No finds were recorded on the farm Walton.

Iron Age
No sites or relics dating to the Iron Age period were recorded.

Burial grounds
No graves or burial grounds were reported on the property.

Desk assessment of the likely heritage sensitivity of the eastern portion of Erith

While prior arrangements had been made for access to the eastern portion of Erith, the owner was in Kimberley as a result of a medical emergency. Regrettably he could not let the heritage team into his property in his absence. In the last resort, a desktop study has been conducted as follows:

The terrain features on both the eastern and western portions of the Farm Erith are basically similar including surface conditions and vegetation configuration. The findings of a ground survey, if it had been done, were not likely to turn out to be fundamentally different from what was encountered on the western portion of the farm. The farm is

bisected by a shallow stream which also runs through the western portion Erith as well as the Farm Walton.

On a more general note, it is an established fact that Stone Age material is widely distributed on the plains, ridges and valleys of the upper Karroo area north of the Orange-Vaal basin. The material comprises scrapers, blades, cores and flakes typologically dating to the Middle Stone Age/Late Stone Age period. Early Stone Age material has been encountered in places with occasional occurrence of hand-axes and cleavers. The sparse occurrence of these finds have been described as background scatters, with few places identified as stone tool quarry or manufacturing sites. These finds have not warranted further action after documentation. Rock Paintings are not likely to occur on Erith as there are no hills or outcrops on the property.

Other heritage resources that might occur in the broader area
The following site types of heritage have been encountered in the locality and are therefore flagged:

- Buildings and objects associated with modern commercial farming from the 19th century
- Graves, burial grounds and human bones.

Postulated heritage sensitivity of the study area
The studies which have been undertaken in the locality provide a good theoretical foundation from which to extrapolate the more likely scenarios on the farm under study. The area was obviously home to MSA/LSA hunter gatherers who left behind the scatters of stone tools and flake waste. The MSA/LSA finds on the western portion of Erith and on the Farm Marsh 467, 10 km to the south, have not warranted further action beyond primary documentation. It can therefore be reasonably concluded that the material yield from the western portion of Erith will not be anything different from what has been encountered on these two neighbouring properties. This is a sound premise from which it is recommended that the mine prospecting should go ahead.

Conclusion and recommendations
In light of these findings, it is recommended that the mineral prospecting can go ahead. As a standard precaution, archaeological deposits are usually buried underground. If archaeological artefacts or skeletal material will be exposed in the area during construction, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.

ARCHAEOLOGICAL AND HERITAGE CHANCE FINDS PROCEDURE Prepared by Edward Matenga (PhD) Appendix 7 attached.

Alet Maritz Mynbou (Pty) Ltd has applied for a prospecting right on the Farm Walton and two portions of the Farm Erith near Kathu under the Gamagara Local Municipality in the Northern Cape Province. When the environmental and heritage approvals have been received prospecting operations will commence at which time the Archaeological and Heritage Chance Finds Procedure (CPF) will be applied as a manual for the protection of unidentified heritage resources which may occur in the footprint of the prospecting right, especially on the eastern portion of Erith where a ground survey was not undertaken.

HERITAGE SITES AND OBJECTS THAT MIGHT OCCUR IN THE AREA

The following site types/objects have been encountered in the broader region and are therefore flagged for possible occurrence on the east portion of Erith:

- Surface scatters or concentrations of stone tools of the ESA, MSA, LSA periods
- Substantial subsurface occurrences of stone tools
- Buildings and objects associated with modern commercial farming from the 19th century
- Graves, burial grounds and human bones.

GENERAL

A principal aim of the CFP is to raise awareness of all personnel in the project regarding the prospect of finding archaeological resources that unseen during the Phase 1 scoping heritage assessment and establish a protocol for the protection of these resources. The appointed Environmental Control Officer (ECO) and Site Manager keep copies of the CPF at the field offices. Training of field personnel on cultural heritage resources that might potentially be found on area should be provided.

PROCEDURE FOR ARCHAEOLOGICAL FINDS

If you discover what you suspect may be a possible archaeological site:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any archaeological remains that you may encounter.
- The finds must be reported to ECO or Site Manager
- The finds must be reported to the heritage authority, i.e. SAHRA and/or the provincial heritage resources agency.
- The heritage authority will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.

- If the potential significance of the finds is deemed to warrant further action and they cannot be avoided, then then heritage specialist will submit a report advising SAHRA accordingly.
- SAHRA will determine the appropriate course of action.

PROCEDURE FOR GRAVES, BURIAL GROUNDS AND HUMAN REMAINS

If you discover what you suspect may be possible human remains:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any possible human remains that you may encounter.
- The finds must be reported to ECO or Site Manager.
- The finds must be reported to the local area station of SAPS.
- The finds must be reported to the SAHRA Burial Grounds and Graves (BGG) Unit.
- The BGG Unit will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the graves/human remains cannot be avoided SAHRA will require that the human remains be re-interred in a formal cemetery.
- Public participation to identify interested and affected parties (if any) will be undertaken in terms of NHRA Regulations 39, 41 and 41 in the Government Notice No R548 (year 2000).
- An application will be lodged to the BGG for the relocation of the human remains in terms of NHRA Regulations 34 in the Government Notice No R548 (year 2000).
- If the graves/ human remains must not be relocated, the BGG Unit may require that any damage done to the site is repaired and a 100m buffer zone is enforced around the site.

PALAEONTOLOGICAL CONTEXT

(AHSA) Archaeological and Heritage Services Africa (Pty) Ltd has appointed Dr. Marion Bamford to conduct a desktop study and compile a Palaeontological Impact Assessment for the prospecting right application on the farms Walton and Erith. The study can be found in Appendix 6.

A palaeontological Impact Assessment was requested for the proposed prospecting rights application on Farms Walton 390 and Erith 389 about 15 km north of Kathu and about 25 km west of Kuruman, Northern Cape.

To comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed development.

The sites for prospecting lie on the ancient and non-fossiliferous strata of the Transvaal Supergroup (below ground), and the Quaternary aeolian sands that are potentially fossiliferous. Fossils could be found in palaeo-spring and palaeo-pan sites but none is visible from the satellite imagery. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no palaeontological site visit is required unless fossils are found once drilling or excavations for the prospecting activities have commenced.

The underlying Ongeluk Formation lavas and the Hotazel Formation iron and manganese deposits do not preserve fossils. Although the Mooidraai Dolomites (Fig 3) might preserve trace fossils of stromatolites, they seem to occur east of the site.

In the overlying Kalahari sands, there is a chance that fossil may occur but only in certain features. Palaeo-pans and palaeo-springs are visible in satellite imagery because of their topography and often are associated with lunette dunes. Vegetation changes are also common. No such features are seen in the Google Earth images. Aeolian sediments that cover most of the region, do not preserve fossils because they have been reworked and windblown

The Kathu Complex includes the excavated sites of Kathu Pan1 (KP1), Kathu Townlands and Bestwood 1 (BW 1). At Kathu Pan, evidence of early hominin occupation has been observed at multiple locations within the pan, but ESA deposits have only been excavated at KP 1. Stratum 4a at KP1 was dated by a combination of OSL and ESR/U-series to ca. 500 k BP. The lithic assemblage from St. 4a is characterized by a prepared core technology that produced both blades and points, and has been attributed to the Fauresmith industry. The lithic assemblage of the underlying St. 4b at Kathu Pan 1 is characterized by well-made handaxes, some bones and other tools (Beaumont, 2004; Walker et al., 2014; Lukich et al., 2020).

Figure 19. SAHRIS palaeosensitivity map for the site for the proposed Prospecting Rights on parts of Farms Walton 390 and Erith 389 shown within the blue rectangles. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are either much too old to contain fossils or have been wind transported. Only such geomorphological features such as palaeo-pans or paleo-springs might entrap fossils. No such feature is visible in the satellite imagery. Since there is an extremely small chance that fossils may be disturbed a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact to fossil heritage resources is extremely low.

Recommendation

Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the Quaternary aeolian sands. There is a very small chance that fossils may occur in pans or springs but none is evident. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr: if fossils are found once drilling or excavations for prospecting have commenced then they

should be rescued and a palaeontologist called to assess and collect a representative sample.

(13) *BROAD-SCALE ECOLOGICAL PROCESSES:*

Critical biodiversity areas and broad-scale processes

The proposed prospecting site falls within a critical biodiversity area, as defined by the Northern Cape Critical Biodiversity Areas Map (Holness and Oosthuysen 2016). This map identifies biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape. Although most of the site comprises Other Natural Areas, Vlermuisleegte is classified as an Ecological Support Area (Figure 19). No Critical Biodiversity Area One-, Two, or Protected Areas occur in the vicinity of the study area.

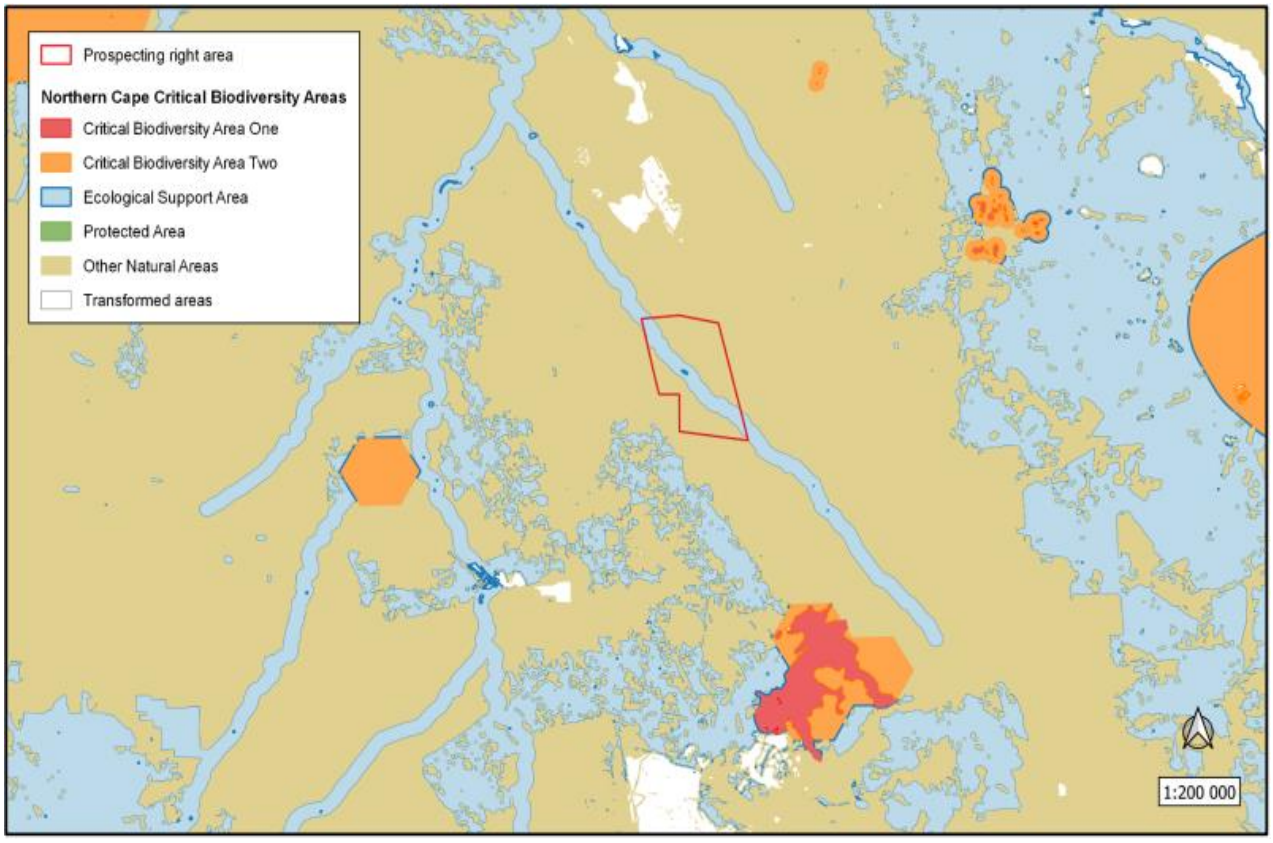


Figure 20. The study area in relation to the Northern Cape Critical Biodiversity Areas.

On the other hand, the Mining and Biodiversity Guidelines (DENC et al. 2013) does not classify any section of the study area to have biodiversity importance, and therefore does not constitute a high risk for mining. These guidelines were developed to identify and categorize biodiversity

priority areas sensitive to the impacts of mining to support mainstreaming of biodiversity issues in decision making in the mining sector. Furthermore, none of the habitats in the study had been identified as ecological corridors within the John Taolo Gaetsewe District Municipality.

Conversely, the National Web based Environmental Screening Tool does consider parts of the study area to be sensitive (Figure 21). This tool is a geographically based web-enabled application which allows a proponent intending to apply for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations 2014 (as amended), to screen their proposed site for any environmental sensitivity. According to this, the study area is of low sensitivity based on the Plant- and Animal Species Themes, but the entire site is of very high sensitivity based on the Aquatic Biodiversity Theme, because it falls within a strategic Water Source area for groundwater. Vlermuisleegte is of very high sensitivity based on the Terrestrial
Biodiversity Theme, which is due it being an Ecological Support Area in the province's CBAs.

The study area also falls within the core area of the Griqualand West Centre (GWC) of Endemism as defined by Frisby et al. (2019) (Figure 21). A centre of plant endemism is an area with high concentrations of plant species with very restricted distributions, known as endemics (Van Wyk and Smith 2001). Relatively small disturbances in a centre of endemism may easily pose a serious threat to its many range-restricted species. Endemics are specifically vulnerable due to their restricted distribution ranges.

With regards to the broad-scale vegetation units of the study area, according to Mucina and Rutherford (2012) the Kathu Bushveld vegetation is least threatened, with very little transformation (1%). However, mining has contributed significantly to habitat transformation in the region (Figure 22), and this prospecting operation will further contribute to the cumulative impacts thereof.

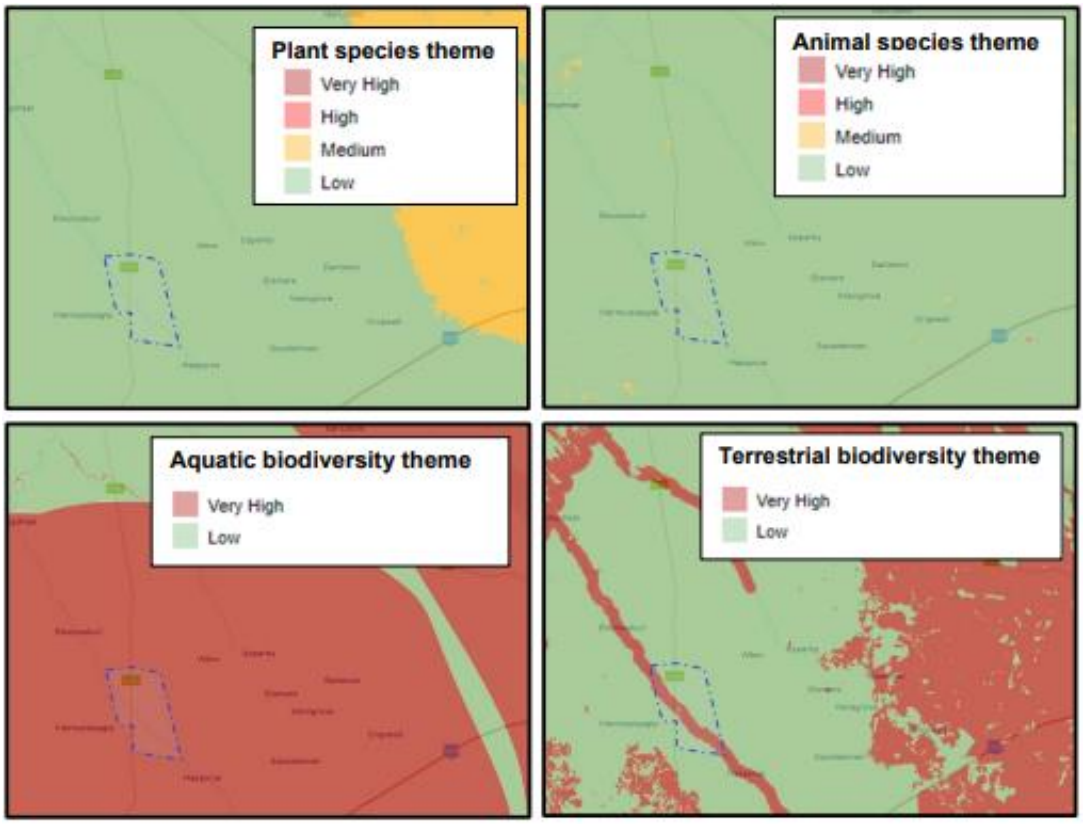


Figure 21. Environmental sensitivities associated with the study area, according to the National Web based Environmental Screening Tool.

Figure 22. The study area in relation to the GWC core, according to Frisby et al. (2019).

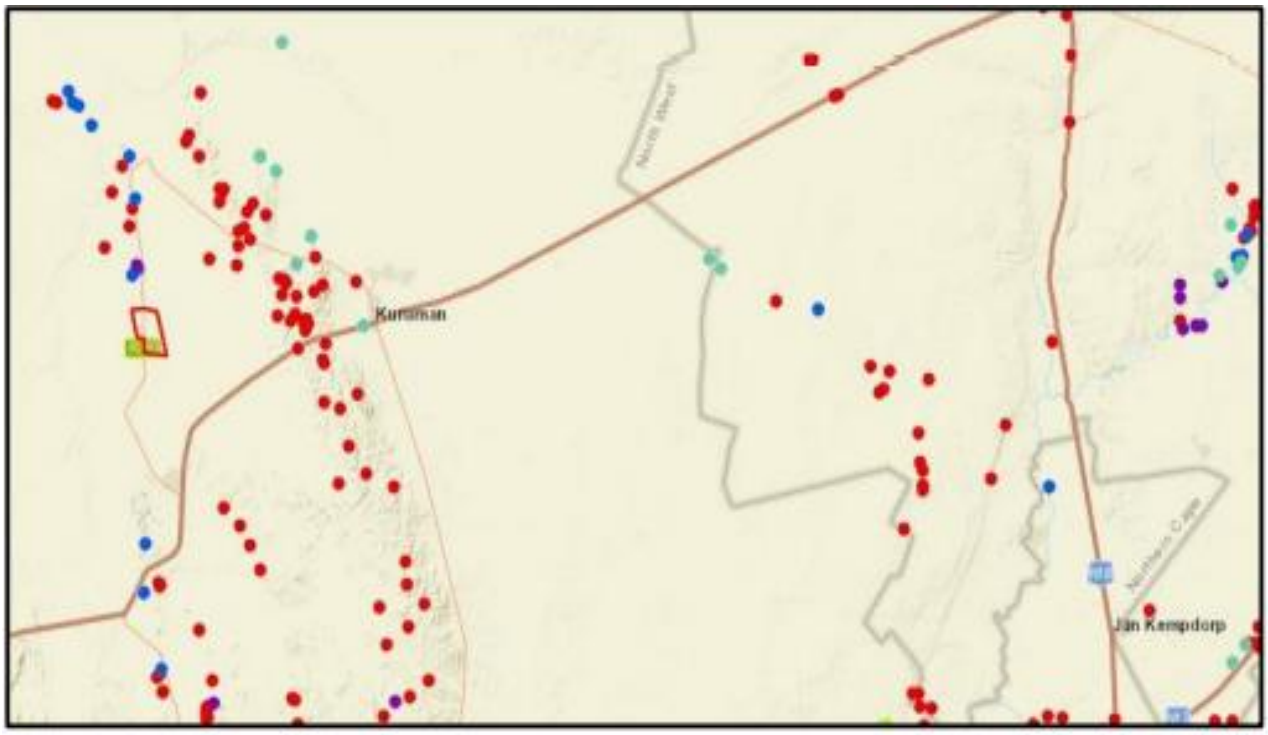


Figure 23. Past and present mining operations near the study area, which increases the cumulative impacts on habitat transformation in the region.

Site sensitivity

The sensitivity map for the proposed prospecting operation is illustrated in Figure 26. Vlermuisleegte is considered to be of very high sensitivity due to its vital hydrological functionality as well as the high density of nationally protected tree species that occur here. All natural channels in which water flows intermittently are also protected in terms of the National Water Act (Act No 36 of 1998). This unit is essentially a no-go area, but it has been earmarked for core project activities.

The remainder of the study site is considered to be of high sensitivity, primarily because of the high occurrences of nationally protected tree species that occur widespread across the entire site as well as potentially important habitat associations for faunal species of conservation concern. Although it is not regarded as no-go areas, activities should only proceed with caution as it may not be possible to mitigate all impacts appropriately. It has however not been earmarked for core project activities.

(14) *SOCIO-ECONOMIC STRUCTURE OF THE REGION:*

Population density, growth and location

Ga-Segonyana Local Municipality is an administrative area in the John Taolo Gaetsewe District of the Northern Cape in South Africa. Ga-Segonyana Municipality originated as a cross-boundary municipality that straddled the boundary between the North-West and Northern Cape Provinces. It was established in 2000 through the amalgamation of Kuruman and Mothibistad Municipalities that includes sections of the Bophirima District Municipality.

80% of the population stays in rural villages. There are 34 residential areas divided into fourteen wards, and the council consists of 14 ward councillors and 13 proportional representative (PR) councillors.

Kuruman is the main town of the area and is known as the "Oasis of the Kalahari". The town has a permanent source of water. Kuruman is situated 1 340 metres above sea level on the Ghaap Plateau. Kuruman is situated on the Namaquari route, forming part of the main route between Gauteng and Namibia and Cape Town via Upington. This route is growing in popularity because of the unspoiled nature and the wide variety of tourist attractions found on the route.

Population Profile

Ga-Segonyana Municipality is located in the John Taolo Geatsewe district and accounts for 43.1% of the population in the district. This makes the Ga-Segonyana Municipility the largest in the district followed by Joe Morolong (34.8%) and then Gamagara (22.1%).

The population in the Ga-Segonyana Municipality increased from 61 967 persons in 1996 to 104 408 persons in 2016 (Table 10). The number of females increased by 20 926 persons, from 32 999 in 1996 to 53 925 in 2016. Males increased by 21 515 persons, from 32 999 in 1996 to 50 483 in 2016. Gender proportions show that there are more females than males in the municipality.

Table 10: Population by sex, 1996-2016

1996			2001			2011			2016		
Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
28 968	32 999	61 967	33 218	37 174	70 392	44 994	48 658	93 651	50 483	53 925	104 408

The population of Ga-Segonyana can also be described in terms of population groups as seen in table 11 below. There was an increase in the Black African, Coloured, and Indian/Asian population groups from 1996 to 2016, whilst the White population shows a marginal decrease over the

same period. There is a greater proportional increase observed for the Black Africans, followed by Coloureds.

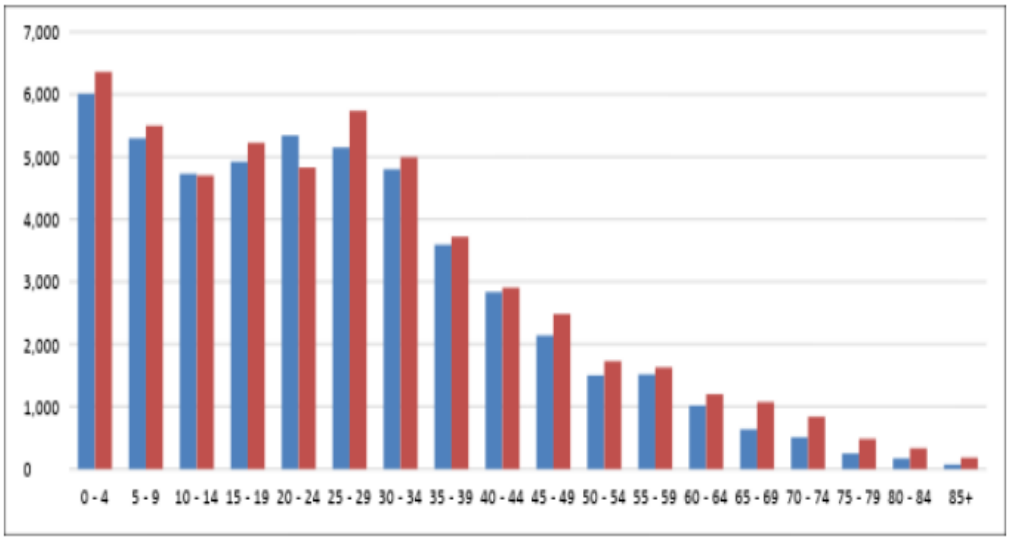
The population thus consist of 90.8% Black Africans, 5.4% Coloured, 3.5% White and 0.4% Indian/Asian.

Table 11: Population by group type, 1996-2016

	1996	2001	2011	2016
Black African	52 068	61 156	81 483	94 783
Coloured	5 358	5 335	7 113	5 604
Indian or Asian	64	76	365	387
White	4 183	3 824	4 294	3 634
Other	-	-	395	-
Unspecified	293	-	-	-
Total	61 967	70 392	93 651	104 408

The population shows a general increase in the population for the age groups over the period from 1996 and 2016. There is however, a significant percentage decrease in the proportion of elderly persons aged 50 years and above, signifying a greater life span for the elderly population in the municipality.

A great proportion of the population of Ga-Segonyana is mainly young, consist mainly of children and youth (Graph 1). There is however a greater proportion of males compared to females for ages from 10 to 64 years, and the female population show a slightly greater proportion in numbers compared to males for ages 65 and above. This signifies a greater lifespan for females than males.



Graph 1: Distribution the total population by age group and sex, 2016

Language spoken mostly by households in Ga -Segonyana municipality is Setswana, which is spoken by 88 811 (86.9%) households followed by those who speak Afrikaans (9.3%). The least spoken languages in Ga-Segonyana are isiZulu, Xitsonga and Sepedi (Table 12).

Table 12: Distribution of persons aged 1 year and older by language spoken most often in the household, 2016

Language spoken in households	Number	%
Afrikaans	9 376	9.2
English	376	0.4
IsiNdebele	25	0.0
IsiXhosa	840	0.8
IsiZulu	247	0.2
Sepedi	203	0.2
Sesotho	955	0.9
Setswana	88 811	86.9
Sign language	46	0.0
SiSwati	12	0.0
Tshivenda	40	0.0
Xitsonga	259	0.3
Khoi; nama and san languages	0	0
Other	991	1.0
Total	**102 180**	**100.0**

Education Levels

Education prepares individuals so that they are able to play an active role in the labour market, which directly affects their quality of life as well as the economy of a country and the area they live in. Through the education level, one can understand the skills that an area has and its potential to contribute positively to the economy (Stats SA).

Table 13 shows an improvement in the level of education in Ga-Segonyana over the period from 1996 to 2016, where there was a decline in the number and proportion of persons aged 20 years and above with no schooling from 23.1% in 1996 to 7.2% in 2016. There is an improvement in the number and proportion of persons with a higher education, from 5.2% to 5.9% over the same period. A significant increase observed in the proportion of persons who have grade 12/standard 10.

Only 0.8% of the White population in Ga-Segonyana aged 20 years and above had no schooling compared to just over 7.0% for each of the other respective population groups. The White population is far more educated than the other population groups in the municipality, where

about 27.4% of Whites have a tertiary education, followed by 6.4% for Coloureds, and 4.9% for Black Africans.

Table 13: Highest level of education for persons aged 20 years and above, 1996-2016

	1996	2001	2011	2016
Number				
No schooling	7 108	7 210	5 124	4 221
Some primary	7 349	8 312	9 124	7 672
Complete primary	2 224	2 287	2 590	2 554
Some secondary	8 772	10 154	18 015	23 015
Grade 12/Std 10	3 706	6 633	12 474	17 715
Higher	1 607	2 218	5 241	3 432
Total	30 766	36 814	52 568	58 609
Percent (%)				
No schooling	23.1	19.6	9.7	7.2
Some primary	23.9	22.6	17.4	13.1
Complete primary	7.2	6.2	4.9	4.4
Some secondary	28.5	27.6	34.3	39.3
Grade 12/ std 10	12.0	18.0	23.7	30.2
Higher	5.2	6.0	10.0	5.9
Total	100.0	100.0	100.0	100.0

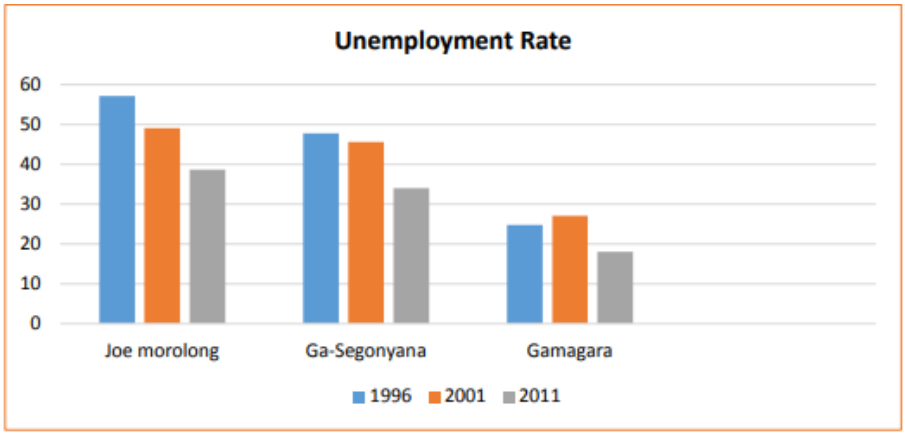
Employment

In 2011, the District had an unemployment rate of 30%. However, this figure does include the discouraged work-seekers which will increase the unemployment rate to 47% if it were to be added. With an unemployment rate of 18%, the Gamagara Municipality is the only Municipality which has a lower unemployment rate than the District. The Joe Morolong Municipality has the highest unemployment rate in the District of 40%.

Table 14: Employment profile in the JTGDM [Source: StatsSA 2016]

Area	Employed	Unemployed	Discouraged Work-seeker	Other not economically active	Age less than 15 years	N/A	Total
Northern Cape	282791	106723	39913	306291	-	410143	1145861
DC45: John Taolo Gaetsewe	43825	18518	10967	64361	-	87127	224799
NC451: Joe Morolong	7828	4912	6200	29569	-	41022	89530
NC452: Ga-Segonyana	19940	10154	3895	25238	-	34426	93651
NC453: Gamagara	16058	3453	873	9553	-	11680	41617

Nearly one in every three persons between 15 and 65 years of age in the JTGDM (30.1%) were unemployed in 2011. This was the second highest figure out of the five DMs, 2% higher than the Northern Cape Provincial figure. Within the local municipalities, Joe Morolong LM has the highest unemployment rate at 38.7% in 2011. The unemployment rate per local municipality can be seen in the graph below.



Graph 2: The rate of unemployment in JTGDM [Source: StatsSA 2011]

Housing

The population of the municipal area lives in three different types of dwellings; formal, informal and traditional. An increase in the proportion of households staying in formal dwellings, from 74.2% in 1996 to 81.6% in 2016 can be seen in table 15. Those who are staying in informal dwellings decreased significantly from 18.6% in 1996 to 4.6% in 2016. Just less than 10.0% of the population stays in traditional dwellings.

Table 15: Type of dwelling occupied by household, 1996-2016.

	Formal dwelling	Informal dwelling	Traditional dwelling	Other	Total*
1996	74.2	18.6	6.6	0.7	100.0
2001	72.3	18.5	8.5	0.6	100.0
2011	81.0	6.7	11.3	0.9	100.0
2016	81.6	4.6	9.5	4.2	100.0

Water

Access to clean water and proper sanitation are key environmental elements that affect health outcomes of households. 70% of the water in John Taolo Gaetsewe District Municipality (JTGDM) is provided by the Regional/local water scheme (i.e. water provided/operated by municipality or other water services provider). Private boreholes are

mostly found on farms and other traditional villages. Due to the low rainfall figures and highly variable run-off, very little usable surface runoff is generated, which has resulted in an ever-increasing use of groundwater resources for human and industrial needs.

The Kuruman Eye, a spring that delivers 20 million litres of water per day, is the main source of water in the district. In total, there are five "eyes" or fountains in the JTGDM. Two of these are associated with the Kuruman Eye, while two (the Klein Koning and Groot Koning eyes) are located south of the R273, and one is located at Manyeding. Intensive agriculture takes place in the vicinity of most of these eyes, except for those in Kuruman, which have been developed for recreational purposes. In addition to the extraction of water from the "eyes", water for human consumption and irrigation is sourced from boreholes throughout the JTGDM.

Table 16: Water Sources within JTGDM [StatsSA 2016]

	Joe Morolong	Ga-Segonyana	Gamagara	John Taolo Gaetsewe
Public/communal tap	27 815	28 283	3 006	59 104
Water-carrier/tanker	315	2 364	278	2 956
Borehole outside the yard	1 238	456	185	1 879
Flowing water/stream/river	2 259	-	-	2 259
Well	406	41	-	444
Spring	-	47	-	47
Other	305	937	361	1 602

Access to Water

The majority of households (89 893) in the Ga-Segonyana Local Municipality have access to drinking water, however the number of households without access to drinking water (13 840) is the most for the District municipality (table 17).

Table 17: Access to drinking water within JTGDM [Source: StatsSA 2016]

	Joe Morolong	Ga-Segonyana	Gamagara	John Taolo Gaetsewe
Yes	75 852	89 893	50 470	216 215
No	7 818	13 840	3 107	24 766
Do not know	172	406	79	656
Unspecified	359	269	-	628

Sanitation

The Millennium Development Goal states the need for "sustainable access to safe drinking water and basic sanitation". The backlogs with regards to provision of water are also evident in the access to sanitation services in the district. Less than one in three of the population in the

JTGDM (28.29%) has access to a flush toilet connected to a sewerage system. This is, however, a little over half the national figure of 54.99% and less than half the figure for the Northern Cape Province (65.74%). This is also far below the figure for the other four district municipalities in the province, with these municipalities all having figures of more than 60%. Nearly half of the population in the JTGDM are reliant on a pitlatrine (57.94%) with or without ventilation. This is more than 20% higher than the provincial figure of 18.89% and far higher than the figures for the four other districts in the province, which are all below 12%. In addition to this, 6.98 % of the population within the district have no toilet facilities, which is sizeably higher than the provincial figure of 4.02%.

Table 18: Access to sanitation within JTGDM [Source: StatsSA 2016]

	Joe Morolong	Ga-Segonyana	Gamagara	John Taolo Gaetsewe
Flush toilet connected to a public sewerage system	3 345	18 682	46 505	68 533
Flush toilet connected to a septic tank or conservancy tank	623	4 903	1 766	7 292
Chemical toilet	632	66	27	724
Pit latrine/toilet with ventilation pipe	46 958	22 976	452	70 387
Pit latrine/toilet without ventilation pipe	21 202	48 645	147	69 994
Ecological toilet (eg. Urine diversion; enviroloo; etc.)	1 880	69	-	1 949
Bucket toilet (collected by municipality)	-	89	-	89
Bucket toilet (emptied by household)	3 311	543	2	3 856
Other	552	1 330	645	2 528
None	5 697	7 104	4 112	16 912

The table below (table 19) shows an increase in the proportion of households in the Ga-Segonyana municipality using a pit-latrine toilet, from 62.1% in 1996 to 67.4% in 2016. There is a slight decrease in the proportion of households that utilize flush or chemical toilets from 23.8% in 1996 to 23.4% in 2016.

Table 19: Type of sanitation facility used by household, 1996-2016

	Flush or chemical toilet	Pit latrine	Bucket latrine	None of the above	Total
1996	23.8	62.1	1.0	13.1	100.0
2001	25.8	54.9	0.8	18.5	100.0
2011	27.4	57.6	1.7	13.3	100.0
2016	23.4	67.4	0.5	8.7	100.0

Electricity

There has been an improvement on the energy use across the whole country. The majority of households (90%) use electricity as the source of energy for lighting, this was previously 88% (in 2011). With regards to the energy/fuel source for cooking, heating and lighting, 76% of the population in the JTGDM use electricity for cooking; 74% use electricity for heating; and 90% use electricity for lighting.

Table 20: Main source of Energy for lighting [Source; StatsSA 2016]

	Joe Morolong	Ga-Segonyana	Gamagara	John Taolo Gaetsewe
Electricity from mains	74 203	94 596	48 794	217 593
Other source of electricity (e.g. generator; etc.)	80	418	62	560
Gas	29	84	47	160
Paraffin	270	2 303	334	2 907
Candles	8 984	6 182	3 752	18 918
Solar	129	477	465	1 071
Other	136	108	-	243
None	141	12	180	333
Unspecified	228	228	23	479

(15) SENSITIVE LANDSCAPES:

"Sensitive Environments" that have statutory protection are the following:¬-

1. Limited development areas (Section 23 of the Environmental Conservation Act, 1989 (Act 73 of 1989).
2. Protected natural environments and national heritage sites.
3. National, provincial, municipal and private nature reserves.
4. Conservation areas and sites of conservation significance.
5. National monuments and gardens of rememberance.
6. Archaeological and palaeontolocial sites.
7. Graves and burial sites.
8. Lake areas, offshore islands and the admirality reserve.
9. Estuaries, lagoons, wetlands and lakes.
10. Streams and river channels and their banks.
11. Dunes and beaches.
12. Caves and sites of geological significance.
13. Battle and burial sites.
14. Habitat and/or breeding sites of Red Data Book species.
15. Areas or sites of outstanding natural beauty.
16. Areas or sites of special scientific interest.
17. Areas or sites of special social, cultural or historical interest.
18. Declared national heritage sites.
19. Mountain catchment areas.

20. Areas with eco-tourism potential.

The relevant specialists will be appointed to conduct specialist studies to assess whether there are any sensitive landscapes within the applicationa area.

(b) Description of the current land uses

(1) *Land Use before Prospecting :*

Dr Elizabeth (Betsie) Milne from Boscia Ecological Consultants has been appointed by Alet Maritz Mynbou to provide an ecological study in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area land capability and land use was described and included in this report as part of the ecological study. (Appendix 4).

The major land uses in the region include activities related to agriculture, hunting and mining. The land capability of the study area is non-arable, with moderately low potential for grazing and wildlife. The agricultural region is demarcated for cattle farming, with the grazing capacity estimated at 11 Ha/LSU. The study area is not suitable for crop irrigation. Currently, the farmsare utilised as natural pastures for domestic livestock.

(2) Evidence of Disturbance: -

A small-scale historic diggings and old fields are also present.

(3) Existing Structures: -

Infrastructure

Existing infrastructure include roads, homesteads, and farm buildings.

Agriculture

Old fields are also present.

Public Roads

A provincial road dissects the study area, and it is currently being upgraded, with a road construction site established on Erith.

Farm tracks

A network of roads traverses the study area.

Fence lines

A network of fence lines traverses the study area.

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

The infrastructure on site is comprehensively discussed in section d(ii) as part of the prospecting methodology discussion, as well as in section g as part of the prospecting footprint description. Furthermore, a comprehensive description of the environment was presented in section g (iv) (A) as part of the baseline report.

(d) Environmental and current land use map

(Show all environmental, and current land use features)

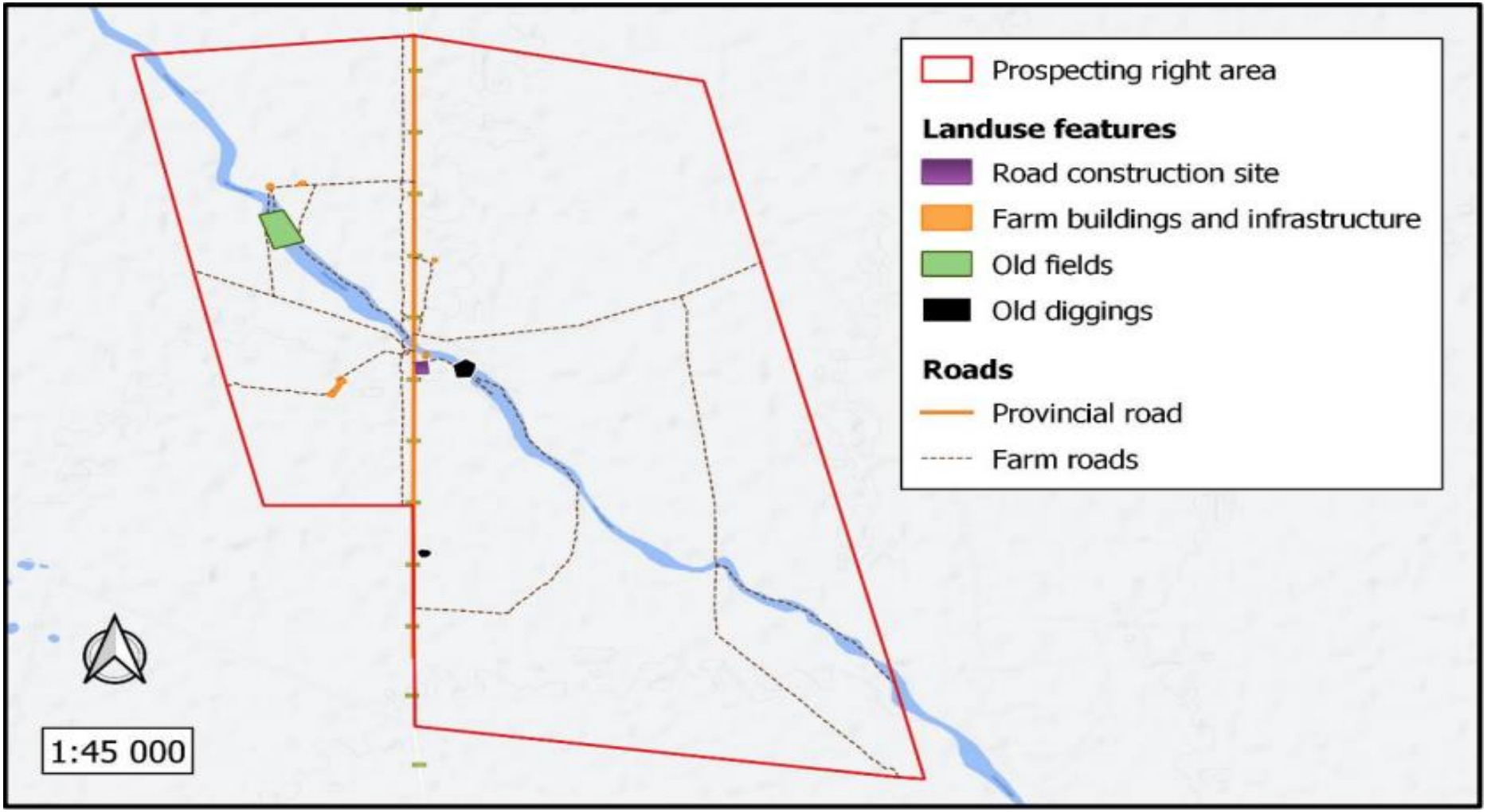


Figure 24. The existing land use features on the prospecting right area.

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated)

Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
PHYSICAL						
Geology and Mineral Resource	Sterilisation of mineral resources	Low	Highly unlikely	Residual	On-site	• Ensure that optimal use is made of the available mineral resource.
Topography	Changes to surface topography Development of infrastructure; and Topsoil dumps.	Low to Medium	Possible for life of operation	Residual	On site	• Prospecting continuously, if possible and does not influence prospecting and safety requirements. • Employ effective rehabilitation strategies to restore surface topography of prospecting areas and bulk sampling site. • All temporary infrastructures should be demolished during closure.
Soils	**Soil Erosion** During clearing of an area for excavations, roads, and infrastructure.	Medium to High	Certain, frequently	Permanent	On-site	• Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in each area have ceased. • Bare ground exposure should be minimised in terms of the surface area and duration.

	Vegetation will be stripped in preparation for placement of infrastructure and excavations, and therefore, the areas will be bare and susceptible to erosion. The sandy substrate of the study area is particularly prone to wind erosion. Topsoil and overburden that is stripped and piled on surrounding areas can be eroded by wind, rain, and flooding. The soil/sediments will be carried away during runoff. The affected areas will be rehabilitated, but full restoration might only occur over several years, after					• The operation must co-ordinate different activities to optimise the excavated pits and trenches and thereby prevent repeated and unnecessary excavations and disturbances to the vegetation and soil. • Construction/excavations during the rainy season (November to March) should be monitored and controlled. • Run-off from exposed ground should be controlled with flow retarding barriers. • All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) to avoid excessive erosional induced losses. • Excavated and stockpiled soil material are to be stored on the higher lying areas of the footprint area and not in any natural storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate. • Regular audits carried out to identify areas where erosion is occurring (incl. linear activities

	the re-establishment of vegetation.					such as roads); followed by appropriate remedial actions.
	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	Loss of soil fertility During clearing of an area for excavations, roads and infrastructure, the removal of topsoil, stockpiling. Topsoil contains living organisms that naturally regulates the ecological functioning of a habitat. Any disturbances to the intact soil profile can result in soil sterilisation. This includes excavations, improper stockpiling, soil erosion and soil	Low to Medium	Possible for life of operation	Residual	On-site	• Topsoil must be removed and stockpiled before the overburden is excavated. • Topsoil should preferably be protected with tarps to regulate air flow and prevent erosion and leaching. • Topsoil stockpiles must be kept as small as possible to prevent compaction and the formation of anaerobic conditions. • Topsoil must be stockpiled for the shortest possible time frames (ideally no longer than two months) to ensure that the quality of the topsoil is not impaired. • Topsoil must not be handled when the moisture content exceeds 12 %. • Topsoil stockpiles must be kept separate from sub-soil overburden. • The topsoil should be replaced as soon as possible on to the backfilled areas, thereby

	compaction. Rainwater can also cause leaching and erosion of stockpiles, resulting in the loss of nutrients.					allowing for the re-growth of the seed bank contained within the topsoil.
	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	Soil pollution Spillage of hazardous material; runoff.	Low - Medium	Possible for life of operation	Residual	On site	• Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. • Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. • Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. • All facilities where dangerous materials are stored must be contained in a bund wall. • Vehicles and machinery should be regularly serviced and maintained.
Land Capability	Loss of land capability through topsoil removal, disturbances and loss of fertility.	Low	Possible for life of operation	Residual	On-site	• Employ appropriate rehabilitation strategies to restore land capability.

Land use	Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation.	Low	Possible for life of operation	Residual	On-site	• Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.
Ground Water Quantity	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
	Hydrocarbon spills from vehicles and fuel storage areas may contaminate the groundwater resource locally	Medium-High	Possible infrequently	Residual	Regional	• Any refuelling or vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. • Drip trays must be available on site and installed under all vehicles during maintenance. • Spill kits to clean up accidental spills from any accidental spillages must be well marked and available on site. • Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. • Vehicles and machinery should be regularly serviced and maintained. • No excavations should take place in the river, drainage lines or depressions.

Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management / mitigation
Surface Water	**Alteration destruction of watercourses** During excavation of minerals, construction of infrastructure and roads, stockpiling. During prospecting activities, the watercourse on site (Vlermuisleegte) might be altered and indirectly affected. This includes direct prospecting within the watercourses as well as development of roads, infrastructure or stockpiles within their channels, catchment areas, or buffer zones. Such activities can	High	Certain for life of operation	Permanent	Regional	• All activities associated with the prospecting operation must be planned to avoid any unnecessary additional disturbances to the watercourses and their buffer zones. • Any new roads created across a watercourse should be done with a conservative approach and should be done in such a way as to preserve the hydrological regime as far as is possible. • Before any prospecting takes place in Vlermuisleegte, a water use license to alter its beds and banks should be obtained from DWS prior to such activities. • Employ sound rehabilitation measures to restore characteristics of all affected watercourses.

	completely change the hydrologic regime or habitat conditions of the watercourses, which will not only compromise their ecological functioning, but also have downstream effects.					
	Siltation of surface water During clearing of an area for the excavation of minerals, construction of infrastructure and roads, stockpiling, natural events. Vegetation will be stripped in preparation for the prospecting areas and associated infrastructure. These bare areas will be very susceptible to	Low Medium	Possible infrequent	Decommissioning	Regional	• Bare ground exposure should always be minimised in terms of the surface area and duration. • Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in the area have ceased. • Any new roads created across a watercourse should be done with a conservative approach and should be done in such a way as to preserve the hydrological regime as far as is possible. • Disturbances during the rainy season should be monitored and controlled.

	water erosion without plants to stabilise the soil, creating potential sediment source zones. High runoff events could potentially cause Vlermuisleegte to be filled with silt from prospecting areas if the sediment source zones lie along its drainage paths. This may lead to a change in hydrologic regime and character of the watercourse.					• Any potential run-off from exposed ground should be controlled with flow retarding barriers. • Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Indigenous Flora	**Loss of and disturbance to indigenous vegetation** During the construction of roads and other necessary	Low - Medium	Certain for life of operation	Residual	On-site	• Implement best practise principles to minimise the footprint of transformation. • Encourage proper rehabilitation of excavated areas, by effective backfilling and returning the stockpiled topsoil.

	infrastructure; the placement of stockpiles; and the clearing of vegetation for excavations, materials storage, and topsoil stockpiles; vehicular movement. Construction and prospecting activities on site will destroy large areas of indigenous vegetation, which in turn will disrupt natural ecological process. It is not expected that the areas of high ecological function and biodiversity will fully rehabilitate following disturbance					• Encourage the growth of natural plant species by sowing indigenous seeds or by planting seedlings. Seeds can be acquired from renukaroo@gmail.com, or harvested from adjacent natural areas. • Ensure measures for the adherence to the speed limit to minimise dust plumes. • Apply for permits to authorise the large-scale clearance of indigenous vegetation from DENC at least three months before such activities will commence.

	events. Vehicle traffic and prospecting activities also generates lots of dust which can reduce the growth success and seed dispersal of many small plant species.					
	Loss of flora with conservation concern / Red data or protected floral species During clearing of an area for excavations, roads, infrastructure, and placement of stockpiles. Intentional removal of listed or protected plant species for non-mine related purposes, e.g., illegal medicinal trade, cultural	Low - Medium	Possible for life of operation.	Residual	On-site	• The footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to excavations. • It is recommended that these plants are identified and marked prior to intended activity. • These plants should ideally be incorporated into the design layout and left in situ. • However, if threatened by destruction, these plants should be removed (with the relevant permits from DAFF and/or DENC) and relocated if possible. • A management plan should be implemented to ensure proper establishment of ex situ

	beliefs, or firewood collection. Species of conservation concern present in the area earmarked for prospecting include Ruschia griquensis and Vachellia erioloba. Many individuals belonging to these species will most certainly be damaged or removed during the operation. Furthermore, any illegal firewood collection or harvesting of succulents by staff, contractors or secondary land users could potentially have a negative impact on the population of these species.					individuals and should include a monitoring programme for at least two years after re-establishment to ensure successful translocation. • The designation of a full-time ECO is vital to render guidance to the staff and contractors with respect to suitable areas for all related disturbance and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. The environmental induction should occur in the appropriate languages for the workers who may require translation. • All those working on site must be educated about the conservation importance of the flora occurring on site.

	Introduction or spread of alien species During the clearing of vegetation, and general disturbances caused by prospecting activities. The extent of alien invasive species in the area shows some level of past disturbance interference in the natural ecosystem and primarily include Prosopis glandulosa. While general clearing of the area and excavation activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plants establish in	Low to Medium	Possible, infrequently.	Residual	Local	• Minimise the footprint of transformation. • Encourage proper rehabilitation of excavated areas. • Encourage the growth of natural plant species. • Mechanical methods of control to be implemented extensively. • Annual follow-up operations to be implemented.

	disturbed areas, it may cause an impact beyond the boundaries of the prospecting site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity as well as the ecological and agricultural value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially					

	reduced. In fact, if the prospecting activities involve the removal of entire shrubs and trees to gain access to underlying minerals it could help with the control of existing infestations in the earmarked areas.					
	Encouragement of bush encroachment During the clearing of vegetation, and general disturbances cause through prospecting activities. The extent of bush encroaching species on site shows fairly high levels of past disturbance	Low	Possible, temporarily	Residual	On-site	• Minimise the footprint of transformation. • Encourage proper rehabilitation of disturbed areas. • Encourage the growth of a diverse selection of natural plant species. • Mechanical methods of control to be implemented selectively. • Annual follow-up monitoring to be implemented.

	interference in the natural ecosystem, presumably through grazing practises. Bush encroachment is a natural phenomenon characterised by the excessive expansion of certain shrub species at the expense of other plant species, especially grasses. In the area earmarked for prospecting, these include Rhigozum trichotomum and Grewia flava. While general clearing of the area and prospecting activities destroy natural vegetation, bush encroaching plants may increase due to their aggressive					

	nature in disturbed areas. If encroaching plants establish in disturbed areas, it may lower the potential for future land use and decrease biodiversity. With proper mitigation, the impacts can be substantially reduced. In fact, the proposed prospecting activities could potentially reduce the extent of these shrubs. By clearing large stands of these species and effectively rehabilitating the cleared areas, it can have a positive effect on the biodiversity.					
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	• Management

Fauna	**Loss, damage and fragmentation of natural habitats** During the clearing of vegetation, and general disturbances cause through prospecting activities. Prospecting activities and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitats. Fragmentation of habitats will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up. This results in a subsequent loss of genetic variability	Medium – High	Certain for life of operation	Residual	Regional	• All activities associated with the prospecting operation must be planned, were possible to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type. • The extent of the area earmarked for prospecting should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so. • Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for employees, machinery and even visitors. • Employ sound rehabilitation measures to restore the characteristics of any affected habitats as far as possible.

	between meta-populations occurring within the study site. Pockets of fragmented natural habitats hinder the growth and development of populations.					
	Disturbance, displacement and killing of fauna Vegetation clearing; excavations; increase in noise and vibration; human and vehicular movement on site resulting from prospecting activities. The transformation of natural habitats will result in the loss of habitat, affecting individual	Low to Medium	Certain, for life of operation	Decommissioning	On-site	• Careful planning of the operation is needed to avoid the destruction of pristine habitats and minimise the overall disturbance footprint. • The extent of the prospecting activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised to do so. Areas surrounding the earmarked site that are not part of the demarcated area should be considered as a no-go zone. • However, if any of the protected species are threatened by destruction, the relevant permits from DENC should be obtained followed by the relevant mitigation

	species and ecological processes. This will result in the displacement of faunal species that depend on such habitats. Protected species are specifically vulnerable to such destruction. For example, when breeding sites or eggs of the ground-nesting Ludwig's Bustard are destroyed through prospecting activities. Increased noise and vibration will also disturb and possibly displace birds and other wildlife. Fast moving vehicles cause road kills of small mammals, birds, reptiles,					procedures stipulated in the permits. • The designation of a full-time ECO is vital to render guidance to the staff and contractors with respect to suitable areas for all related disturbances. • Everyone on site must undergo environmental induction for awareness on not harming or collecting species that are often persecuted out of superstition and to be educated about the conservation importance of the fauna occurring on site. • Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert. • Employ measures that ensure adherence to the speed limit to lower the risk of animals being killed on the roads.

	amphibians, and many invertebrates. Intentional killing of snakes, reptiles, vultures, and owls will negatively affect the local populations.					
Ecological Processes	During the clearing of vegetation for excavations and the construction of roads and infrastructure. The prospecting operation itself is expected to cause habitat transformation through the excavation of open pits and will thereby contribute moderately to cumulative habitat loss and the disruption of the broad-scale landscape	Medium High	Certain for life of operation	Residual	Regional	• Minimise the footprint of transformation. • Encourage proper rehabilitation of affected areas. • Encourage the growth of natural plant species. • Encourage the preservation of ecological corridors. • Employ sound rehabilitation measures to restore the characteristics of affected habitats.

	connectivity in the region. Transformation of intact habitat on a cumulative basis would contribute to the fragmentation of the landscape and would potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations. A high amount of habitat transformation, specifically through mining, exist in the region, but the proposed site is still largely surrounded by indigenous pastures and the footprint area of the proposed					

	activity is fairly small. Therefore, the cumulative impact for the proposed prospecting operation is moderate.					
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	• Management
Air Quality	Sources of atmospheric emission associated with the prospecting operation are likely to include fugitive dust from materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.	Low	Certain for life of operation	Residual	Local	• Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for prospecting only, hereby reducing the surface area exposed to wind erosion. • Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads. • The length of time where kieselguhr prospecting areas are exposed should be restricted. Prospecting should

						not be delayed after vegetation has been cleared and topsoil removed where possible. • Dust suppression methods should, where logistically possible, be implemented at all areas that may/are exposed for long periods of time. • For all Prospecting activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.
SOCIAL SURROUNDINGS						
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Noise Impacts	Clearing of footprint areas, stripping of stockpiling of topsoil.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Construction activities Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels

	Construction of internal Roads	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Construction of the soil stock pile and material stock pile. Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Clearing of new open cast prospecting areas, stripping and stockpiling of topsoil. Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels
	Diesel generators Noise increase at the prospecting site.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels.
	Additional traffic to and from the site	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturers

						specifications on acceptable noise levels
	Maintenance activities at the different sites.	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels
	Backfill of prospecting footprint area	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels
	Removal of infra-structure	Low	Possible Infrequently	Decommissioning	Local	• Equipment and/or machinery which will be used must comply with the manufacturers specifications on acceptable noise levels • Removal of infrastructure should be limited to daytime only. • Noise survey to be carried out to monitor the noise levels during these activities.
Visual impacts	Potential visual impact on gravel road	Low Regional	Certain	Construction, Operation and Decommissioning	Local Site	The design of the proposed prospecting development will determine the visual impact. As the visual impact would be low.
	Potential Visual Impact on the surrounding land users/ residents	Low Regional	Highly Likely	Construction, Operation and Decommissioning	Local Site	The design of the proposed prospecting development will determine the visual impact.

	Potential visual impact of the proposed development on the Sense of Place	Low Regional	Highly Likely	Construction, Operational and Decommissioning	Local Site	Design of the proposed development can ensure that the development forms part of the area and is aesthetically pleasing.
	Potential visual impact of the proposed development on the operational phase of the surrounding land users in close proximity.	Low Regional	Highly likely	Operational	Local Site	Wetting of exposed areas should be undertaken as required to prevent dust pollution having a negative visual impact. • Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way; • Rehabilitation of disturbed areas and re-establishment of vegetation;
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Low Likelihood	Decommissioning	Local	• Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.
Heritage resources	The Deterioration of sites of cultural and heritage importance.	Medium	Uncertain	Decommissioning	Local	• Any heritage and cultural resources (e.g. ruins, historic structures, etc.) must be protected and preserved by the delineation of a no-go zone. • Should any further resources be disturbed, exposed or uncovered during site preparations, these should

						immediately be reported to an accredited archaeologist. Burial remains should not be disturbed or removed until inspected by an archaeologist.
Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence Extent	Management
Socio-Economic	**Population Impacts** Employment Opportunities and skills Inequities	Medium Positive	Probable	Start-up and Construction	Positive Local	• Training of potential future employees, contract workers and/or community members should focus on prospecting related skills which would furthermore equip trainees/ beneficiaries with the necessary portable skills to find employment at the available employment sectors within the study area. Multi-skilling is thus not necessarily the preferred training and skills development method. • Training courses should be accredited and certificates obtained should be acceptable by other related industries.
	Safety and Security Risks	Low Negative	Highly Probable	Construction	Negative Local	• A Fire/Emergency Management Plan should be developed and implemented at the outset of the prospecting operation.

						• Open fires for cooking and related purposes should not be allowed on site. • Appropriate firefighting equipment should be on site and workers should be appropriately trained for fire fighting • The prospecting area should be fenced or access to the area should be controlled to avoid animals or people entering the area without authorisation. • The prospecting site should be clearly marked and "danger" and "no entry" signs should be erected. • Speed limits on the local roads surrounding the prospecting sites should be enforced. • Speeding of prospecting vehicles must be strictly monitored • Local procurement and job creation should receive preference.
	Heritage Features	Low Negative	Highly probable	Construction	Negative Local	• Any heritage features (e.g. buildings and/or artefacts) on site must be protected and monitored • Should it be necessary, such heritage features should be

						assessed and be recorded by an accredited Heritage Impact Specialist or archaeologist
	Intrusion Impacts Visual Impact and Sense of Place	Low Negative	Probable	Construction	Negative Local	• The prospecting site should be kept litter free • Site rehabilitation on certain sections of the site should occur as soon as the prospecting process allows • The recommendations made by the Visual Impact Assessment should be adhered to.
	Noise Impact	Low Negative	Probable	Construction	Negative Local	• The mitigation measures of the Noise Impact Assessment should be implemented • Vehicles should be in a good working order • Prospecting activities should be kept to normal working hours e.g. 7 am until 5 pm during weekdays
	Intrusion Impacts Visual Impact and Sense of Place	Low Negative	Possible for life of operation	Operational	Negative Local	• Recommendations and mitigation measures as part of the EMP should be strictly implemented. • Prospecting areas should be rehabilitated as soon as the Prospecting Works Programme allows
	Noise Impact	Low Negative	Probable	Operational	Negative Local	• Recommendations and mitigation measures proposed

						by the Noise Impact Assessment should be strictly implemented • Noise generating activities should be kept to normal working hours (e.g. 7 am until 5 pm) where possible
Interested and Affected Parties	Loss of trust and a good standing relationship between the IAP's and the prospecting company.	Low to medium	Possible	Construction, Operational and Decommissioning	Local	• Maintain active communication with IAPs. • Ensure transparent communication with IAPs at all times. • IAPs must be kept up to date on any changes in the prospecting operation. • A complaints management system should be maintained by the prospector to ensure that all issues raised by community members are followed up and addressed appropriately.

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision)

Methodology used in determining and ranking the nature, severity, consequences, extent, duration and probability of potential environmental impacts and risks

The Different environmental components on which the project (can) have an impact are:

1. **Geology**
2. **Topography**
3. **Soil**
4. **Land Capability**
5. **Land Use**
6. **Flora (Vegetation)**
7. **Fauna**
8. **Surface Water**
9. **Ground Water**
10. **Air Quality**
11. **Noise and vibration**
12. **Archaeological and Cultural Sites**
13. **Sensitive Landscapes**
14. **Visual Aspects**
15. **Socio-Economic Structures**
16. **Interested and Affected Parties**

Impact Assessment

Before the impact assessment could be done the different project Activities/infrastructure components were identified.

1	**Ablution Facilities:** In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.
2	**Clean & Dirty water system: Berms** It is anticipated that the operations will establish storm water control berms and trenches to separate clean and dirty water on the prospecting site.
3	**Fuel Storage facility (Concrete Bund walls and Diesel car):** A Diesel Car is the only fuel storage that is taking place on the Application area
4	**Prospecting Area:** Area applied for to pit and trench for kieselguhr (bulk sampling).
5	**Salvage yard (Storage and laydown area).**
6	**Residue Stockpile area.**
7	**Waste disposal site** Waste disposal site (domestic and industrial waste): It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area: • Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.
8	**Roads (both access and haulage road on the prospecting site):** **Access** Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the prospecting operation will create an additional 1500m² of roads, with a width of 8 meters where no reserve exists and where the reserve exists 15 meters. The current access road is deemed adequate for a service road into the prospecting site.
9	**Water tank:** It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

The criteria used to assess the significance of the impacts are shown in the table 21 below/overleaf. The limits were defined in relation to mining characteristics. Those for probability, intensity/severity and significance are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered. These natural mitigation measures were defined as natural conditions, conditions inherent in

the project design and existing management measures, which alleviate impacts. The significance of the impacts was calculated by using the following formula:

(Severity + Extent + Duration) x Probability weighting

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts.

Table 21. Consequence of impacts is defined as follows.

CONSEQUENCE				
Colour Code	**Consequence rating**	**Rating**	**Negative Impact**	**Positive Impact**
	Very low	3 -16	Acceptable/Not serious	Marginally Positive
	Low	17 - 22	Acceptable/Not serious	Marginally Positive
	Low- Medium	23 -33	Acceptable/Not desirable	Moderately Positive
	Medium	34 - 48	Generally undesirable	Beneficial
	Medium-High	49 - 56	Generally unacceptable	Important
	High	57 - 70	Not Acceptable	Important
	Very High	90 - 102	Totally unacceptable	Critically Important

Consequence of impacts is defined as follows:

Very Low - Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

Low - Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

Low Medium Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

Medium - Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be feasible and possible.

Medium High- Impact would be real but could be substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and possible but may be difficult and or costly.

High - Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these.

Before any assessment can made the following evaluation, criteria need to be described.

Table 22. Criteria used to assess the **SIGNIFICANCE** of impacts

Weight	Severity	Spatial scope (Extent)	Duration
5	Disastrous	Trans boundary effects	Permanent
4	Catastrophic / Major	National / Severe environmental damage	Residual
3	High / Critical / Serious	Regional effect	Decommissioning
2	Medium / slightly harmful	Immediate surroundings / local / outside mine fence	Life of Operation
1	Minimal/potentially harmful	Slight permit deviation / on-site	Short term / construction (6 months – 1 year)
0	Insignificant/ non harmful	Activity specific / No effect / Controlled	Immediate (0 – 6 months)

Table 23. Explanation of **PROBABILITY** of impact occurrence

Weight number		1	2	3	4	5
Frequency						
Probability	Frequency of impact	Highly unlikely	Rare	Low likelihood	Probable / Possible	Certain
		Practically impossible	Conceivable but very unlikely	Only remotely possible	Unusual but possible	Definite
	Frequency of activity	Annually or less	6 months/ temporarily	Infrequent	Frequently	Life of Operation

Table 24. Explanation of **SEVERITY** of the impact

Weight	Impact Severity	Explanation of Severity
0	Insignificant/ non harmful	There will be no impact at all – not even a very low impact on the system or any of its parts.
1	Minimal/potentially harmful	Impact would be negligible. In the cast of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple. In the case of positive impacts alternative means would almost all likely to be better, if one or a number of ways, then this means of achieving the benefit.
2	Medium / slightly harmful	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required or both. In the case of positive impacts alternative means for achieving this benefit would be easier, cheaper, more effective, less time-consuming, or some combination of these.
3	High / Critical / Serious	Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts other means other means of covering these benefits would be about equal in cost and effort.

4	Catastrophic / Major	Impacts of substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these. In the case of positive impacts other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
5	Disastrous	Of the highest order possible within the bounds of impacts which could occur, in the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impacts there is no real alternative to achieving the benefit.

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

During construction and operation of the prospecting, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and excavations will alter the topography by adding features to the landscape. Topsoil removal and bulk sampling will unearth the natural topography. The construction of infrastructure and various facilities in the prospecting area can also result in loss of soil due to erosion. Vegetation where present will be stripped in preparation for placement of temporary prospecting infrastructure, and therefore the areas will be bare and susceptible to erosion. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The declared areas will be rehabilitated, but full restoration of soil might only occur over some time, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

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

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances, and loss of soil fertility; and secondly through the improper placement of infrastructure. The site has a land capability for non-arable, with moderately low potential for grazing and wildlife, while the hills are classified as wilderness with very low land use potential, but grazing activities can still be performed in areas not earmarked for prospecting, and with proper rehabilitation the land capabilities and land use potential can be restored.

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

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

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

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

During the prospecting operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The site will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by prospecting activities are low.

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

Furthermore, the core earmarked area for the proposed operation falls within a watercourse (Vlermuisleegte), that has been moderately modified (PES C) and regarded to be of low ecological importance and sensitivity. To alter the beds and banks of Vlermuisleegte, a water use license should be obtained from DWS prior to such activities.

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

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

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

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

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

viii) The possible mitigation measures that could be applied and the level of risk

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered)

Geology and mineral resource

Level of risk: Low

Mitigation measures

- Ensure that optimal use is made of the available mineral resource through proper planning.
- The kieselguhr deposit should be delineated first and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources.
- No dumping of materials prior to approval by mine manager.

Topography

Level of risk: Low-Medium

Mitigation measures

- Prospecting continuously, if possible, otherwise when they become available;
- Employ effective rehabilitation strategies to restore surface topography of and controlled dumping and prospecting site;
- All temporary infrastructures should be demolished during closure.

Soil erosion

Level of risk: Medium - High

Mitigation measures

- Bare ground exposure should always be minimised in terms of the surface area and duration.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in the area have ceased.
- New roads, infrastructure or prospecting areas that will be developed over a watercourse should be kept at a minimum, following a conservative approach and a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Disturbances during the rainy season should be monitored and controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.
- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Soil pollution

Level of risk: Low – Medium

Mitigation measures

- Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure, and stockpile areas.
- These topsoil stockpiles must be kept as small as possible to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings and succulent cuttings.
- Vehicles and machinery should be regularly serviced and maintained.
- Refuelling and vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Drip trays must be available on site and installed under all stationary vehicles.
- Spill kits to clean up accidental spills must be well-marked and available on site.
- Workers must undergo induction to ensure they are prepared for rapid clean-up procedures.
- Any soil or area that is contaminated must be cleaned immediately by removing the soil and disposing it as hazardous waste in the correct manner.

Loss of Soil fertility

Level of risk: Low – Medium

Mitigation measures

- Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure and stockpile areas.
- These topsoil stockpiles must be kept as small as possible to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.

- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings and succulent cuttings.

Land capability and land use

Level of risk: Low - Medium

Mitigation measures

- Employ appropriate rehabilitation strategies to restore land capability.
- Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.

Ground water

Level of risk: Low - Medium

Mitigation measures

- Any refuelling or vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Drip trays must be available on site and installed under all vehicles during maintenance.
- Spill kits to clean up accidental spills from any accidental spillages must be well marked and available on site.
- Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures.
- Vehicles and machinery should be regularly serviced and maintained.
- No excavations should take place in the river, drainage lines or depressions.

Surface water

Alteration / destruction of watercourses

Level of risk: High

Mitigation measures

- All activities associated with the prospecting operation must be planned to avoid any unnecessary additional disturbances to the watercourses and their buffer zones.
- Any new roads created across a watercourse should be done with a conservative approach and should be done in such a way as to preserve the hydrological regime as far as is possible.
- Before any prospecting takes place in Vlermuisleegte, a water use license to alter its beds and banks should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected watercourses.

Surface water

Siltation of surface water

Level of risk: High

Mitigation measures

- Bare ground exposure should always be minimised in terms of the surface area and duration.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in the area have ceased.
- Any new roads created across a watercourse should be done with a conservative approach and should be done in such a way as to preserve the hydrological regime as far as is possible.
- Disturbances during the rainy season should be monitored and controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.
- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Loss of Indigenous vegetation

Level of risk: Low to medium

Mitigation measures

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.
- Implement effective avoidance measures to limit any activities in the highly sensitive areas, by applying the no-go principles.
- Ensure measures for the adherence to a maximum speed limit of 40 km/h to minimise dust fallout and associated effects on plants in the adjacent pristine areas.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.
- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of affected areas.
- Apply for permits to authorise the clearance of indigenous plants from DENC at least three months before such activities will commence.

Loss of Red data and / or protected floral species

Level of risk: Low to medium

Mitigation measures

- The footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to any destructive activities by means of a search-and-rescue operation.
- It is recommended that these plants are identified and marked prior to intended activity. These plants should ideally be incorporated into the design layout and left in situ. However, due to the nature of the proposed prospecting activities they will most likely all be removed or relocated (if possible). The relevant permits from DENC should be applied for at least three months before such activities will commence.

- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of all the rescued plants.
- A management plan should be implemented to ensure proper establishment of ex situ individuals and should include a monitoring programme for at least two years after re-establishment to ensure successful translocation.
- The designation of an environmental officer is recommended to render guidance to the staff and contractors with respect to suitable areas for all related disturbance and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. The environmental induction should occur in the appropriate languages for the workers who may require translation.
- All those working on site must be educated about the conservation importance of the flora occurring on site as well as the legislation relating to protected species.
- Employ regulatory measures to ensure that no illegal harvesting takes place.

Introduction or spread of alien species

Level of risk: Low to medium

Mitigation measures

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.
- Mechanical methods of control should be implemented pro-actively as soon as invasive species start to emerge.
- Regular follow-up monitoring of invasive control areas needs to be implemented to ensure effective eradication.
- Encourage proper rehabilitation of disturbed areas through soil restoration and reseeding of indigenous plant species.

Encouraging bush encroachment

Level of risk: Low

Mitigation measures

- Mechanical methods of control should be implemented pro-actively when encroaching species form dense stands.
- Regular follow-up monitoring of encroached control areas needs to be implemented to ensure effective eradication.
- Encourage proper rehabilitation of disturbed areas through soil restoration and reseeding of indigenous plant species.

Fauna

Habitat Fragmentation

Level of risk: Medium-high

Mitigation measures

- All activities associated with the prospecting operation must be planned, where possible to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.

- The footprint areas of the prospecting activities must be scanned for any burrow complexes prior to any destructive activities by means of a search-and-rescue operation.
- It is recommended that nest, burrows, tunnels or complexes are identified and marked prior to intended activity and should be incorporated into the design layout and left in situ. However, due to the nature of the proposed prospecting activities they will most likely be destroyed. The relevant permits from DENC should be applied for at least three months before such activities will commence.
- The extent of the earmarked area should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so.
- Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for employees, machinery or even visitors.
- Ideally, no new roads should be created across a watercourse and no prospecting should take place in a watercourse or along its banks. However, for this proposed activity this is unavoidable and therefore all new roads, infrastructure or prospecting areas that will be developed over a watercourse should be kept at a minimum, following a conservative approach. A water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected habitats.

Fauna

Disturbance, displacement and killing of fauna

Level of risk: Low - Medium

Mitigation measures

- Careful planning of the operation is needed to avoid the destruction of pristine habitats and minimise the overall disturbance footprint.
- The extent of the prospecting activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised to do so. Areas surrounding the earmarked site that are not part of the demarcated area should be considered as a no-go zone.
- The footprint areas of the prospecting activities must be scanned for any protected faunal species prior to any destructive activities by means of a search-and-rescue operation.
- If any of the protected wildlife species are directly threatened by habitat destruction or displacement during the prospecting operation, then the relevant permits from DENC should be obtained followed by the relevant mitigation procedures stipulated in the permits.
- It is recommended that these individuals be rescued and relocated by a registered professional prior to intended activities.

- Ideally, no prospecting should take place in a watercourse. However, for this proposed activity this is unavoidable and therefore prospecting areas that will be developed over a watercourse should be kept at a minimum, following a conservative approach. A water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Everyone on site must undergo environmental induction for awareness on not capturing or harming species that are often persecuted out of superstition and to be educated about the conservation importance of the fauna occurring on site.
- All reptiles, amphibians as well as bird nests and small mammal litters and dens that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to a maximum speed limit of 40 km/h as well as driving mindfully on site to lower the risk of animals being killed on the roads or elsewhere in the prospecting area.

Broad Scale Ecological processes

Level of risk: Medium - High

Mitigation measures

- Implement best practise principles to minimise the footprint of transformation.
- Ideally, no new roads should be created across a watercourse and no prospecting should take place in a watercourse or along its banks. However, for this proposed activity this is unavoidable and therefore all new roads, infrastructure or prospecting areas that will be developed over a watercourse should be kept at a minimum, following a conservative approach. A water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected habitats.
- The footprint areas must be scanned for protected species prior to any destructive activities by means of a search-and-rescue operation and the relevant permits from DENC should be applied for at least three months before any species are threatened by destruction, death or displacement.

Air quality

Level of risk: Low

Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for prospecting only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.
- Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression.
- Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet

suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads.

- The length of time where kieselguhr prospecting areas are exposed should be restricted. Prospecting should not be delayed after vegetation has been cleared and topsoil removed where possible.
- Dust suppression methods should, where logistically possible, be implemented at all areas that may/are exposed for long periods of time.
- For all Prospecting activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees.

Noise and vibration

Level of risk: Low

Mitigation measures

- Vehicles should be in a good working order
- Prospecting activities should be kept to normal working hours e.g. 7 am until 5 pm during weekdays

Visual impacts

Level of risk: Low

Mitigation measures

Mitigation measures may be considered in two categories:

Primary measures that intrinsically comprise part of the development design through an interactive process. Mitigation measures are more effective if they are implemented from project inception when alternatives are being considered; and

Secondary measures designed to specifically address the remaining negative effects of the final development proposals:

- During the prospecting phases the following mitigation measures should be implemented to minimise the visual impact.
- Restrict the activities and movement of workers and vehicles to the immediate site and existing access roads.
- Ensure that rubble, litter and disused materials are managed and removed regularly.
- Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way.
- Reduce and control dust emitting activities through the use of approved dust suppression techniques; and
- Restrict activities to daylight hours in order to negate or reduce the visual impacts associated with lighting or restrict lighting to certain areas.
- During operational phase, the following mitigation measures should be implemented to minimise the visual impact.

- Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way;
- Rehabilitation of disturbed areas and re-establishment of vegetation;

Traffic and road safety
Level of risk: Low
Mitigation measures
- Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.

Heritage resources
Level of risk: Low-Medium
Mitigation measures
- Any heritage and cultural resources (e.g. ruins, historic structures, etc.) must be protected and preserved by the delineation of a no-go zone.
- Should any further resources be disturbed, exposed or uncovered during site preparations, these should immediately be reported to an accredited archaeologist. Burial remains should not be disturbed or removed until inspected by an archaeologist.

Chance Find Protocol taken from Prof Marion Bamford
Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
2. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.

7. If no good fossil material is recovered then no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further monitoring is required.

Socio-economic

Level of risk: Low

Mitigation measures

In order to ensure that negative impacts are minimised and positives are enhanced, the following is recommended:

- The prospector must ensure that false expectations are not created regarding job creation.
- Contractors and employees should not be permitted to wander outside the prospecting area.
- Uncontrolled settlement of contractors and workers outside of the site will be prevented.
- The expectations of what benefits can accrue to the community must be managed from the initiation of the project.

Interested and affected parties

Level of risk: Low - Medium

Mitigation measures

- Maintain active communication with IAPs.
- Ensure transparent communication with IAPs at all times.
- IAPs must be kept up to date on any changes in the prospecting operation.
- A complaints management system should be maintained by the prospector to ensure that all issues raised by community members are followed up and addressed appropriately.

ix) Motivation where no alternative sites were considered

No alternative location for the proposed prospecting operation was considered, as the proposed kieselguhr deposits occur in this area. There is therefore no other alternative with regard to the overall prospecting footprint.

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

This is an application for a Prospecting Right for the searching or looking for possible kieselguhr deposits. The geological nature of the application area lends itself to the possible occurrence of kieselguhr. There is no alternative development location for the site as this is the area with the possible mineable resource.

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

All drainage lines are of very high sensitivity due to their important hydrological function. The most profound impacts associated with the proposed operation are expected to be related to risks associated to potential erosion of the sandy substrate, the loss of plant species of conservation concern as well as the disruption of ecological corridors. Therefore, a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities. Permit applications regarding protected flora and harvesting of indigenous vegetation (Northern Cape Department of Environment and Nature Conservation) and a licence application regarding protected trees (Department of Agriculture, Forestry and Fisheries) also need to be lodged if the relevant species are to be affected.

i) Assessment of each identified potentially significant impact and risk

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

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT (e.g., dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution) ….**	**ASPECTS AFFECTED**	**PHASE In which impact is anticipated (e.g., construction, commissioning, operational, Decommissioning, closure, post closure)**	**SIGNIFICANCE IF NOT MITIGATED**	**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**	**SIGNIFICANCE IF MITIGATION**
Ablution Facilities Chemical Toilets	Soil contamination Possible Groundwater contamination	Soil Groundwater Odours	Construction Commissioning Operational Decommissioning Closure	Low	Maintenance of sewage facilities on a regular basis. Removal of chemical toilets on closure	Low
Clean & Dirty water systems:	Surface disturbance Soil contamination Surface water contamination	Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Low	It will be necessary to divert storm water around dumps areas by a berm that will prevent surface run-off into the drainage areas. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away. Maintenance of trenches	Low

					Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill. Linear infrastructure such as roads and pipes will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	
Fuel Storage facilities (Diesel tanks/car)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Soil Groundwater Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Maintenance of Diesel bund walls. Oil traps Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. All facilities where dangerous materials are stored must be contained in a bund wall. Vehicles and machinery should be regularly serviced and maintained.	Low
Prospecting Area.	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface Water Topography	Commissioning Operational Decommissioning Closure	Medium	Access control Dust control and monitoring Noise and vibration control and monitoring Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays MRD stability control and monitoring	Low

	Surface disturbance Surface water contamination	Safety			Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring on site. The environmental induction should occur in the appropriate languages for the workers who may require translation.	

					Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert. Employ measures that ensure adherence to the speed limit. Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to minimise the overall prospecting footprint. The Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting; Snares & traps removed and destroyed;	
Salvage yard (Storage and laydown area)	Possible Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Fauna Flora Groundwater Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Access Control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill	Low
Stockpile area	Dust Possible Groundwater contamination	Air Quality Fauna Flora Noise Soil	Commissioning Operational Decommissioning Closure	Medium	Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills	Low

	Surface water contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Surface disturbance	Surface Water			Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints.	
Waste disposal site (domestic and industrial waste):	Groundwater contamination Contamination of soil Surface water contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals	Low
Roads (both access and haulage road on the prospecting site):	Dust Groundwater contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Develop a mechanism to record and respond to complaints. Linear infrastructure such as roads will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	Low

Temporary Workshop Facilities and Wash bays	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Medium	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills	Low
Water distribution Pipelines which is not anticipated but is included for completeness should it become necessary	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Monitor pipeline for water leaks Maintenance of pipeline Linear infrastructure such as roads will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	Low
Water tanks: 1 X 10 000 litre water tanks and purifiers for potable water for each site.	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Medium	Maintain water tanks and structures	Low

j) Summary of specialist reports

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

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
ECOLOGICAL AND WETLAND ASSESSMENT REPORT **ALET MARITZ MYNBOU (Pty) Ltd** **Remaining Extent of the Farm Erith 389** **Portion 3 of the Farm Erith 389** **Remaining Extent of Portion 2 of the Farm Walton 390** **District Kuruman** **Northern Cape Province** **By Dr Betsie Milne** **January 2022** **APPENDIX 4**	Two distinct plant communities were identified on site, i.e., Woodland on alluvium and Woodland on red sand. Both have a high occurrence of plant species of conservation concern that occur widespread across each unit as well as important habitat associations for animal species of conservation concern. However, the woodland on alluvium is most sensitive to disturbances based on the associated hydrological functioning of Vlermuisleegte. The most profound impacts are expected to be related to risks associated to potential erosion of the sandy substrate, the loss of plant species of conservation concern as well as the disruption of ecological corridors. Nevertheless, these impacts are all considered to have moderate effect, which can be reduced if mitigated. Species of conservation concern that are found in the area earmarked for prospecting include Vachellia erioloba and V. haematoxylon. A licence application regarding protected trees should be lodged with Department of Agriculture, Forestry and Fisheries three months prior to any potential disturbances to these trees. The prospecting operation will also result in the large-scale clearance of indigenous vegetation. Permit applications regarding large-scale harvesting of indigenous vegetation need to be lodged with the Northern Cape Department of Environment and Nature Conservation three months prior to any clearance of vegetation. To conclude, the destruction of the natural plant species and habitats within the study area is inevitable. The significance of the impacts will be affected by the success of the mitigation measures implemented and the rehabilitation programme for the prospecting area. In my opinion, authorisation can be granted if the applicant commits to the adherence of effective avoidance, management, mitigation, and rehabilitation measures.	X	Contained in the mitigation measures and EMPR

HERITAGE IMPACT ASSESSMENT IN TERMS OF SECTION 38(8) OF THE NATIONAL HERITAGE RESOURCES ACT (NO 25/1999) FOR MINE PROSPECTING ON THE FARM WALTON AND TWO PORTIONS OF THE FARM ERITH NEAR KATHU UNDER THE GAMAGARA LOCAL MUNICIPALITY, NORTHERN CAPE. **Dr. Edward Matenga** **18 July 2021** **APPENDIX 5**	In light of these findings, it is recommended that the mineral prospecting can go ahead. As a standard precaution, archaeological deposits are usually buried underground. If archaeological artefacts or skeletal material will be exposed in the area during construction, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.	X	Contained in the mitigation measures and EMPR
Palaeontological Impact Assessment for the Prospecting Rights Application on Farms Walton 390 and Erith 389, north of Kathu, Northern Cape Province **DESKTOP STUDY (PHASE 1)** **Prof. Marion Bamford** **4 July 2021** **APPENDIX 6**	Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the Quaternary aeolian sands. There is a very small chance that fossils may occur in pans or springs but none is evident. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr: if fossils are found once drilling or excavations for prospecting have commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample.	X	Contained in the mitigation measures and EMPR

ALET MARITZ MYNBOU (Pty) Ltd **Remaining Extent of the Farm Erith 389** **Portion 3 of the Farm Erith 389** **Remaining Extent of Portion 2 of the Farm Walton 390** **District Kuruman** **Northern Cape Province** **Ecological & Wetland Assessment Report in application for Environmental Authorisation related to a Prospecting Right Application that was lodged with the Department of Mineral Resources** **July 2022** **APPENDIX 7**	Two distinct plant communities were identified on site, i.e., Open woodland on calcareous sand and Woodland on red sand. Both have a high occurrence of plant species of conservation concern that occur widespread across each unit as well as important habitat associations for animal species of conservation concern. However, the open woodland on calcareous sand is most sensitive to disturbances based on the associated hydrological functioning of Vlermuisleegte, which is classified as a lowland river. The most profound impacts are expected to be related to risks associated to the degradation of Vlermuisleegte as a watercourse, potential erosion of the sandy substrate, the loss of plant species of conservation concern as well as the disruption of ecological corridors. Nevertheless, these impacts are all considered to have moderate effect, which can be reduced if mitigated. Species of national conservation concern that are found in the area earmarked for prospecting include Vachellia erioloba and V. haematoxylon. A licence application regarding protected trees should be lodged with Department of Agriculture, Forestry and Fisheries three months prior to any potential disturbances to these trees. The prospecting operation will also result in the removal of provincially protected plant species and the large-scale clearance of indigenous vegetation. Permit applications regarding removal of protected plants and the large-scale harvesting of indigenous vegetation need to be lodged with the Northern Cape Department of Environment and Nature Conservation three months prior to any clearance of vegetation. Furthermore, the core earmarked area for the proposed operation falls within a watercourse (Vlermuisleegte), that has been moderately modified (PES C) and regarded to be of low ecological importance and sensitivity. To alter the beds and banks of Vlermuisleegte, a water use license should be obtained from DWS prior to such activities. To conclude, the degradation of natural habitats and removal of nationally protected trees are inevitable during the proposed operation. The significance of the impacts will be affected by the success of the mitigation measures implemented and the rehabilitation programme for the prospecting area. In my opinion, authorisation should only be granted if the applicant commits to the adherence of effective avoidance, management, mitigation, and rehabilitation measures.		

Attach copies of the Specialist Reports as appendices

k) Environmental impact statement

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

- The Ablution facilities will have a very low impact on groundwater and soil in case of an emergency spill after mitigation.
- The Clean & Dirty water systems may have a low impact on groundwater, soil and surface water after mitigation.
- The Fuel Storage facilities (Diesel tanks/car) may have a low impact on groundwater, soil, and surface water after mitigation.
- Furthermore, the core earmarked area for the proposed operation falls within a watercourse (Vlermuisleegte), that has been moderately modified (PES C) and regarded to be of low ecological importance and sensitivity. To alter the beds and banks of Vlermuisleegte, a water use license should be obtained from DWS prior to such activities.
- The Prospecting Area may have a low- medium impact on air quality fauna, flora, noise, soil and topography after mitigation.
- The Salvage yard (Storage and laydown area) may have a low impact on fauna, flora, groundwater, soil and surface water after mitigation.
- The Residue stockpiles area may have a low impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The waste disposal sites (domestic and industrial waste) may have a low impact on groundwater, soil, and surface water after mitigation.
- The Roads (both access and haulage road on the prospecting site) may have a low impact on air quality, fauna, flora, noise, soil and surface water after mitigation.
- The Workshops and Wash bays may have a low impact on groundwater, soil and surface water after mitigation.
- The Water tanks may have a low impact on fauna, flora, and surface water after mitigation.

To conclude, the degradation of natural habitats and removal of nationally protected trees are inevitable during the proposed operation. The significance of the impacts will be affected by the success of the mitigation measures implemented and the rehabilitation programme for the prospecting area. In my opinion, authorisation should only be granted if the applicant commits to the adherence of effective avoidance, management, mitigation, and rehabilitation measures.

The EAPs and environmental consultants responsible for the compilation of this document, and the associated PPP are of the opinion based on the presented specialist assessments and impact assessment that the Environmental Authorization application should be authorised.

The following mitigation measures are crucial and should form part of the environmental authorisation to ensure that the applicant manages impacts adequately:

- Adhere to the approved Environmental Management Programme
- Adhere to the Emergency procedures Report and implement spill clean-up procedures
- Apply for relevant permits with authorities for the removal of indigenous tree species and indigenous vegetation if applicable.
- Major spills should be reported within 24hr to the Department of Water and Sanitation and the NCDENC.

The nature of impacts can vary widely depending on the type of physical environment, the size of the activity and the perceptions and values of each of the affected parties. It was the objective of the assessment to identify both positive and negative impacts. The existing information was reviewed to assess the present status of the environment and the extent to which they have already been modified. The planned activities and associated infrastructure were used as reference to assess potential impacts.

In general, the environmental impacts associated to the prospecting operation are rather negative, while the social impacts are more beneficial. Impacts on vegetation are likely to be most profound, because the prospecting operation will constitute clearance of indigenous vegetation and most likely also the removal of protected species if any is encountered. Soil erosion and surface water deterioration are likely to be possible important impacts if appropriate management strategies are not practised.

Positive impacts include the demarcation and subsequent protection of heritage resources and the eradication of alien invasive species. Positive social impacts include the creation of jobs, social upliftment, training opportunities, community development and numerous economic benefits.

To conclude, it must be accepted that any activities will have both physical and social impacts. Therefore, the destruction of the natural environmental features within the prospecting area is inevitable. The significance of the impacts will however be affected by the success of the mitigation measures implemented and the rehabilitation programme for the prospecting area.

(ii) Final Site Map;

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicated any areas that should be avoided, including buffers. Attach as **Appendix (Figure 26)**

The final site map below indicates the prospecting application area in which all prospecting will take place. Existing roads are also depicted.

The aquatic buffer segment identified for Vlermuisleegte has gentle sloping land and sandy textured soils with high permeability. The river's buffer requirements are low in general, due to Vlermuisleegte being a first order low land river, the arid climate of the

region, the high pH buffering capacity linked to the calcareous soil and moderately robust vegetation with good interception potential. The final aquatic impact buffer requirement is 17 m, which is based on a pre- and post-mitigation assessment, mainly since core prospecting activities are planned to take place in the river itself and therefore the threats remain the same, even with mitigation.

The sensitivity map for the Alet Maritz Mynbou prospecting operation is illustrated in Figure 26. All watercourses in the study area are also unique habitats protected in terms of the National Water Act (Act No 36 of 1998).

The only other buffers that must be implemented is the 100m away from any fixed infrastructure like the roads that runs on the farm in terms of the Mine Health and Safety Act, 1996 (Act no 29 of 1996) Regulations relating to surveying, mapping and mine plans. These regulations states that a prospecting operation must take reasonable measures to ensure that-

No prospecting operations are carried out within a horizontal distance of 100 (one hundred) metres from reserve land, buildings, roads, railways, dams or any other structure whatsoever including such structures beyond the prospecting boundaries, or any surface, which it may be necessary to protect in order to prevent any significant risk, unless a lesser distance has been determined safe by risk assessment and all restrictions and conditions determined in terms of the risk assessment are complied with;

No graves or burial grounds were reported on the properties.

Please see Final Site Map below.

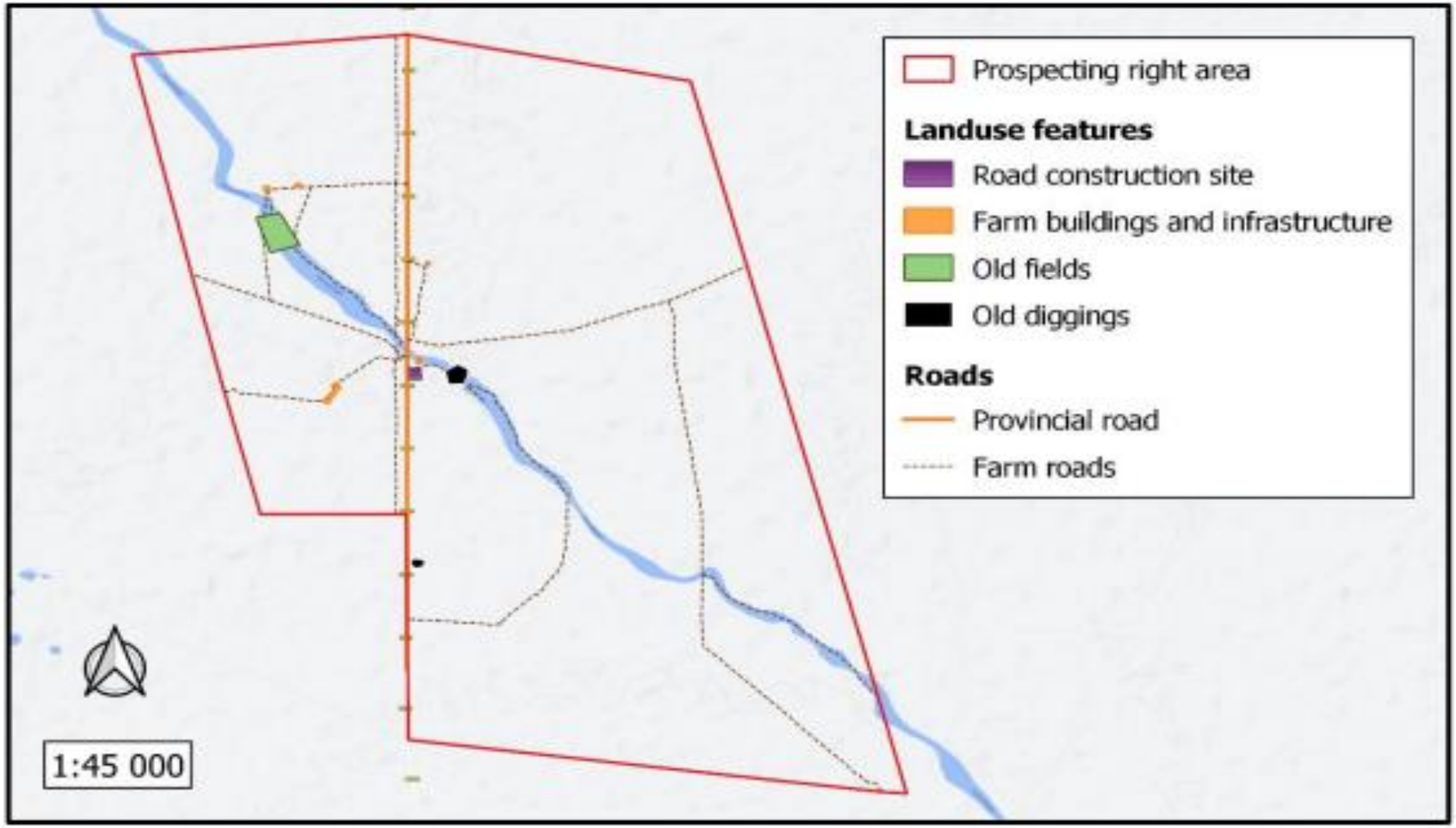


Figure 25. Existing land use features map (Dr. B Milne, Ecological report).

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

During construction and operation of the prospecting, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and excavations will alter the topography by adding features to the landscape. Topsoil removal and prospecting will unearth the natural topography. The construction of infrastructure and various facilities in the prospecting area can also result in loss of soil due to erosion. Vegetation where present will be stripped in preparation for placement of temporary prospecting infrastructure, and therefore the areas will be bare and susceptible to erosion. The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The declared areas will be rehabilitated, but full restoration of soil might only occur over some time, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

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

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

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

Construction and prospecting activities on site will reduce the natural habitat for ecological systems to continue their operation. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species. It

is expected that protected species if present can be destroyed during the bulk sampling operation.

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

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

During the prospecting operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The prospecting operation will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by prospecting activities are low.

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

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

It is difficult to predict the actual impact of the prospecting closure in advance, but it is acceptable to assume that the prospecting closure will have a negative impact on the

local and regional economy with a high probability of occurrence, a medium severity due to small scale and a medium significance.

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

The prospecting activities and associated infrastructure by itself will thus not introduce new social risks and hazards, but only increase the probability and scale of those already associated with the existing prospecting activities

On a more detailed level, the following **positive** impacts are anticipated:

- The creation of job opportunities in the area, and associated local economic development;
- Economic and revenue contribution to the local municipal area, as well as the district and adjacent municipalities;
- The involvement of Alet Maritz Mynbou with regards to training and capacity building of its employees and subsequent improvement of the livelihoods of the employees' families, as well as its efforts in sustaining the socio-economic development of the communities in close proximity to the operation;
- The positive impact of prospecting activity on the regional and local economy; and
- Positive impact of extensive local procurement focus.

Negative impacts as a result of the prospecting activity refer to:

- Inconvenience and intrusion impacts during the project such as the inflow of an additional workforce to the area, the possible influx of jobseekers, possible increase in the criminal activities (safety and security issues), disruption of social networks, as well as possible health risks;
- Disruptions in the daily living and movement patterns (increased traffic and possible dust pollution);
- Additional pressure on infrastructure development and maintenance;
- General intrusion impacts such as visual and noise pollution

From a social perspective it can be concluded that the proposed Alet Maritz Mynbou Project would not result in permanent damaging social impacts. The socio-economic benefits associated with the prospecting activity outweigh the negative social impacts. It is thus concluded that the proposed project is acceptable from a social point of view, provided that mitigation measures are implemented.

Negative impacts the degradation of natural habitats and removal of nationally protected trees are inevitable during the proposed operation. The significance of the impacts will be affected by the success of the mitigation measures implemented and the rehabilitation programme for the prospecting area. Authorisation should only be

granted if the applicant commits to the adherence of effective avoidance, management, mitigation, and rehabilitation measures.

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

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

Topography

- All prospecting areas must be rehabilitated if and when possible and made safe so as to reflect as far as possible the pre-prospecting topography of the area.
- All temporary features e.g. must be removed and handled in the prescribed manner during rehabilitation.

Soil

Alteration of soil character and quality

- Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure, and stockpile areas.
- These topsoil stockpiles must be kept as small as possible to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings and succulent cuttings.
- Vehicles and machinery should be regularly serviced and maintained.
- Refuelling and vehicle maintenance must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.
- Drip trays must be available on site and installed under all stationary vehicles.
- Spill kits to clean up accidental spills must be well-marked and available on site.
- Workers must undergo induction to ensure they are prepared for rapid clean-up procedures.
- Any soil or area that is contaminated must be cleaned immediately by removing the soil and disposing it as hazardous waste in the correct manner.

Soil

Loss of soil fertility

- Topsoil needs to be removed and stored separately during prospecting and the construction of roads, infrastructure and stockpile areas.
- These topsoil stockpiles must be kept as small as possible to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must by no means be mixed with sub-soils.
- The topsoil should be replaced as soon as possible on to the disturbed areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.
- For restoration of the affected areas without topsoil, soils can be sourced from other sustainable areas and chemically changed to match with the surrounding environment.
- To restore areas where compacted soil occurs, a ripper blade or deep plow can be pulled across the affected area to alleviate compaction.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings and succulent cuttings.

Soil

Soil Erosion

- Bare ground exposure should always be minimised in terms of the surface area and duration.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible once activities in the area have ceased.
- New roads, infrastructure or prospecting areas that will be developed over a watercourse should be kept at a minimum, following a conservative approach and a water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Disturbances during the rainy season should be monitored and controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.
- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Flora

Loss of indigenous vegetation

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.
- Implement effective avoidance measures to limit any activities in the highly sensitive areas, by applying the no-go principles.
- Ensure measures for the adherence to a maximum speed limit of 40 km/h to minimise dust fallout and associated effects on plants in the adjacent pristine areas.
- Encourage the growth of natural plant species in all affected areas by sowing indigenous seeds or by planting seedlings.

- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of affected areas.
- Apply for permits to authorise the clearance of indigenous plants from DENC at least three months before such activities will commence.

Flora

Loss of Red data and/or protected floral species

- The footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to any destructive activities by means of a search-and-rescue operation.
- It is recommended that these plants are identified and marked prior to intended activity. These plants should ideally be incorporated into the design layout and left in situ. However, due to the nature of the proposed prospecting activities they will most likely all be removed or relocated (if possible). The relevant permits from DENC should be applied for at least three months before such activities will commence.
- The setup of a small nursery is advisable to maximise translocation and re-establishment efforts of all the rescued plants.
- A management plan should be implemented to ensure proper establishment of ex situ individuals and should include a monitoring programme for at least two years after re-establishment to ensure successful translocation.
- The designation of an environmental officer is recommended to render guidance to the staff and contractors with respect to suitable areas for all related disturbance and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. The environmental induction should occur in the appropriate languages for the workers who may require translation.
- All those working on site must be educated about the conservation importance of the flora occurring on site as well as the legislation relating to protected species.
- Employ regulatory measures to ensure that no illegal harvesting takes place.

Flora

Introduction or spread of alien species

- Implement best practise principles to minimise the footprint of transformation, by keeping to existing roads and earmarked areas where possible.
- Mechanical methods of control should be implemented pro-actively as soon as invasive species start to emerge.
- Regular follow-up monitoring of invasive control areas needs to be implemented to ensure
- effective eradication.
- Encourage proper rehabilitation of disturbed areas through soil restoration and reseeding of indigenous plant species.

Flora

Encouraging bush encroachment

- Mechanical methods of control should be implemented pro-actively when encroaching species form dense stands.
- Regular follow-up monitoring of encroached control areas needs to be implemented to ensure effective eradication.
- Encourage proper rehabilitation of disturbed areas through soil restoration and reseeding of indigenous plant species.

Fauna

Habitat fragmentation

- All activities associated with the prospecting operation must be planned, where possible to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- The footprint areas of the prospecting activities must be scanned for any burrow complexes prior to any destructive activities by means of a search-and-rescue operation.
- It is recommended that nest, burrows, tunnels or complexes are identified and marked prior to intended activity and should be incorporated into the design layout and left in situ. However, due to the nature of the proposed prospecting activities they will most likely be destroyed. The relevant permits from DENC should be applied for at least three months before such activities will commence.
- The extent of the earmarked area should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so.
- Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no-go zone for employees, machinery or even visitors.
- Ideally, no new roads should be created across a watercourse and no prospecting should take place in a watercourse or along its banks. However, for this proposed activity this is unavoidable and therefore all new roads, infrastructure or prospecting areas that will be developed over a watercourse should be kept at a minimum, following a conservative approach. A water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected habitats.

Fauna

Disturbance, displacement and killing of fauna

- Careful planning of the operation is needed to avoid the destruction of pristine habitats and minimise the overall disturbance footprint.
- The extent of the prospecting activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised to do so. Areas surrounding the earmarked site that are not part of the demarcated area should be considered as a no-go zone.
- The footprint areas of the prospecting activities must be scanned for any protected faunal species prior to any destructive activities by means of a search-and-rescue operation.
- If any of the protected wildlife species are directly threatened by habitat destruction or displacement during the prospecting operation, then the relevant permits from DENC

should be obtained followed by the relevant mitigation procedures stipulated in the permits.

- It is recommended that these individuals be rescued and relocated by a registered professional prior to intended activities.
- Ideally, no prospecting should take place in a watercourse. However, for this proposed activity this is unavoidable and therefore prospecting areas that will be developed over a watercourse should be kept at a minimum, following a conservative approach. A water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Everyone on site must undergo environmental induction for awareness on not capturing or harming species that are often persecuted out of superstition and to be educated about the conservation importance of the fauna occurring on site.
- All reptiles, amphibians as well as bird nests and small mammal litters and dens that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to a maximum speed limit of 40 km/h as well as driving mindfully on site to lower the risk of animals being killed on the roads or elsewhere in the prospecting area.

Broad scale ecological processes

- Implement best practise principles to minimise the footprint of transformation.
- Ideally, no new roads should be created across a watercourse and no prospecting should take place in a watercourse or along its banks. However, for this proposed activity this is unavoidable and therefore all new roads, infrastructure or prospecting areas that will be developed over a watercourse should be kept at a minimum, following a conservative approach. A water use license to alter the beds and banks of each earmarked watercourse should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected habitats.
- The footprint areas must be scanned for protected species prior to any destructive activities by means of a search-and-rescue operation and the relevant permits from DENC should be applied for at least three months before any species are threatened by destruction, death or displacement.

Surface water

Alteration / destruction of watercourses

- All activities associated with the prospecting operation must be planned to avoid any unnecessary additional disturbances to the watercourses and their buffer zones.
- Any new roads created across a watercourse should be done with a conservative approach and should be done in such a way as to preserve the hydrological regime as far as is possible.
- Before any prospecting takes place in Vlermuisleegte, a water use license to alter its beds and banks should be obtained from DWS prior to such activities.
- Employ sound rehabilitation measures to restore characteristics of all affected watercourses.

Surface water

Siltation of surface water

- Bare ground exposure should always be minimised in terms of the surface area and duration.
- Re-establishment of plant cover on disturbed areas must take place as soon as possible once
- activities in the area have ceased.
- Any new roads created across a watercourse should be done with a conservative approach and should be done in such a way as to preserve the hydrological regime as far as is possible.
- Disturbances during the rainy season should be monitored and controlled.
- Any potential run-off from exposed ground should be controlled with flow retarding barriers.
- Regular monitoring during the prospecting operation should be carried out to identify areas where erosion is occurring; followed by appropriate remedial actions.

Groundwater

- Vehicle- and equipment maintenance must only be allowed within the maintenance area. Only emergency breakdowns may be allowed in other areas.
- The following procedure must be followed if a vehicle or piece of equipment would break down inside an excavation and outside of the maintenance area.
    - Drip pans must be placed at all points where diesel, oil or hydraulic fluid may drip and in so doing contaminate the soil.
    - All efforts must be made to move the broken-down vehicle or piece of equipment to the maintenance area.
    - If the vehicle/piece of equipment cannot be moved, the broken part must firstly be drained of all fluid. The part must then be removed and taken to the maintenance area.
- No repairs may be allowed outside the maintenance area except for emergencies.
- Equipment used as part of the proposed operation must be adequately maintained so as to ensure that the oil, diesel, grease or hydraulic fluid does not leak during the operation.
- Fuel and other petrochemicals must be stored in steel receptacles that comply with SANS 10089-1:2003 (SABS 089-1:2003) standards. An adequate bund wall, 150% of volume of the largest storage receptacle, must be provided for fuel and diesel areas to accommodate any spillage or overflow of these substances. The area inside the bund wall must be lined with an impervious lining to prevent infiltration of the fuel into the soil (and ultimately groundwater).
- Proper sanitation facilities must be provided for employees.
- Acceptable hygienic and aesthetic practices must be adhered to.
- The workshops, washing bays and sewage tanks should be constructed far away from significant aquifer systems.
- SOP for storage, handling and transport of different hazardous materials.
- Place oil traps (drip trays) under stationary vehicles, only re-fuel al fuelling stations, construct structures to trap fuel spills at fuelling stations, immediately clean oil and fuel spills and dispose of contaminated material at licensed sites only.

Ensure good housekeeping rules.

Air Quality

To limit the creation of nuisance, dust the following management guidelines must be followed:

- Avoidance of unnecessary removal of vegetation.
- Routine spraying of unpaved site areas and roads utilized by the prospecting operation with water if necessary.
- Speed limits of vehicles inside the prospecting area must be strictly controlled to avoid excessive dust or the excessive deterioration of the roads to be used.
- Continuous dumping and rehabilitation of disturbed areas.
- All cleared, disturbed or exposed areas must be re-vegetated as soon as practically possible to prevent the formation of additional sources of dust.

Noise

- Working hours must be kept between sunrise and sunset as far as possible.
- As a minimum, ambient noise levels emanating from the prospecting activities may not exceed 82dBA at the site boundary.
- The Company must comply with the Occupational Noise Regulations of the Occupational Health and Safety Act, Act 85 of 1993.
- The company must comply with the measures for good practice with regard to management of noise related impacts during the operation.
- The management objective must be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the prospecting area and that which may migrate outside the prospecting area.
- When the equivalent noise exposure, as defined in the South African Bureau of Standards Code of Practice for the Measurement and Assessment of Occupational Noise for Hearing Conservation Purposes, SABS 083 as amended, in any place at or in any mine or works where persons may travel or works exceeds 82 dB (A), the site manager will take the necessary steps to reduce the noise below this level.
- Hearing protection must be provided to all employees where attenuation cannot be implemented.
- If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.

Mechanical equipment

- All mechanical equipment must be in good working order and vehicles must adhere to the relevant noise requirements of the Road Traffic Act.
- All vehicles in operation must be equipped with a silencer on its exhaust system.
- Safety measures, which generate noise such as reverse gear alarms on large vehicles, must be appropriately calibrated / adjusted.

Safety

- No employees may reside on the prospecting site.

- Access and haul roads must be maintained.
- Security access point to ensure monitoring of access to the site.

Archaeology:

- All operators of equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered:
    - All activity in the immediate vicinity (50m radius of the site) should cease.
    - The heritage practitioner should be informed as soon as possible.
    - In the event of obvious human remains the SAPS should be notified.
    - Mitigation measures (such as refilling) should not be attempted.
    - The area in a 50m radius of the find should be cordoned off with hazard tape.
    - Public access should be limited.
    - No media statement should be released until such time as the heritage practitioner has had sufficient time to analyse the finds.

Chance Find Protocol

- Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.
- The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
- When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
- Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
- Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
- Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
- If no good fossil material is recovered then no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
- If no fossils are found and the excavations have finished then no further monitoring is required.

Visual

- Security Lights must be fixed at an angle to ensure that it does not cause a disturbance to the surrounding environment at night.
- Prospecting Areas must be subject to progressive controlled backfilling and made safe.
- Permanent structures or features that are part of the proposed prospecting operation must be kept neat and well presented.
- Waste material of any description must be removed from the prospecting area on a regular basis and be disposed of at a recognized landfill facility.

The **impact management objectives** for the Alet Maritz Mynbou planned prospecting operation should include:

- To ensure efficient extraction of the kieselguhr and to prevent the sterilization of any kieselguhr reserves.
- To limit the alteration of the surrounding topography
- To manage and preserve soil types
- To prevent the loss of land capability
- To ensure the continuation of economically viable land use.
- To ensure that the surrounding ground water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quality of ground water resources.
- To ensure that the surrounding surface water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quantity and quality of ground water resources.
- The non-perennial stream is classified as a water system according to GN704 and is a natural storm water accumulation stream. No water system shall be bulk sampled before an authorization is obtained from DWS.
- Rehabilitation of disturbed areas during the prospecting life cycle as well as during closure phase has to be done to minimize erosion and/or pollution of natural streams.
- To contain soils and materials within demarcated areas and prevent contamination of storm water runoff.
- To minimise the loss of natural vegetation.
- To prevent the proliferation of alien invasive plants species.
- To protect the wildlife and bird species.
- To protect the natural habitat of wildlife and bird species.
- To maintain visual integrity; and to minimise the extent of the generation of dust in order to minimise the aspect of nuisance and health impacts to sensitive receptors.
- To minimise noise and vibration to a level that disturbances felt by the communities are limited.
- To reduce the impact on visual quality due to intrusive infrastructure, activities and facilities.
- To ensure that all traffic generated by the proposed prospecting development does not negatively impact on existing road networks and infrastructure; and to ensure traffic safety.
- To preserve the historical and cultural artefacts located on site in compliance with the South African Heritage Resources Act, 1999 (Act No 25 of 1999).
- To ensure that the current socio-economic status quo is improved.

- To be transparent and practise effective communication; in order to maintain good relationships with all interested and affected parties.

m) Final proposed alternatives

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

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed project enables sustainable prospecting, a number of feasible options will be explored. The various alternatives in terms of land use, project infrastructure, method and proceeding without the prospecting operation will be assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality of the prospecting operation will however not form part of this consideration, as the location of the prospecting site is determined by the possible geological location of the mineral resource.

The core earmarked area for the proposed operation falls within a watercourse (Vlermuisleegte), that has been moderately modified (PES C) and regarded to be of low ecological importance and sensitivity. To alter the beds and banks of Vlermuisleegte, a water use license should be obtained from DWS prior to such activities.

To conclude, the degradation of natural habitats and removal of nationally protected trees are inevitable during the proposed operation. The significance of the impacts will be affected by the success of the mitigation measures implemented and the rehabilitation programme for the prospecting area. In my opinion, authorization should only be granted if the applicant commits to the adherence of effective avoidance, management, mitigation, and rehabilitation measures.

n) Aspects for inclusion as conditions of Authorisation

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

The general conditions; including management of activity, monitoring, recording and reporting to the Department, commissioning of the activity, operation of the activity, site closure and decommissioning as well as non-compliances; as required in terms of the Environmental Impact Assessment Regulations promulgated in terms of NEMA (Act 107 of 1998) as well as objectives and requirements of relevant legislation, policies and guidelines must be included in the Authorization.

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

(Which relate to the assessment and mitigation measure proposed)

The above mitigation measures are tried and tested over many years in the prospecting industry. The Company must monitor the potential impacts throughout the life of operation, and mitigate any deviations detected. This has been proven to be very effective in existing operations.

The EAP who compiled this document and the specialists who compiled the respective specialist reports have extensive knowledge in their field and it is therefore assumed that the above assumptions are adequate and that the information provided is correct.

Assumptions and limitation out of the Ecological and wetland assessment.

Due to the brief duration of the surveys and the lack of comprehensive seasonal coverage, the species list obtained during the site visits cannot be regarded as comprehensive. Ideally, a site should be visited several times during different seasons to ensure that the full complement of plant species present is captured. However, this is rarely possible due to time and cost constraints related to the mining and prospecting right application processes. The survey was nevertheless conducted in such a manner to ensure all representative communities are traversed and therefore is likely to have included most of the dominant and common species present. The surveys also took place during spring and winter, which are not the most optimal time of the year. The best time to evaluate vegetation in the study area is in summer after the first rain, when the vegetation has had a chance to respond and is in an actively growing state. Grasses were dormant, but some shrubs and forbs started flowering. Therefore, the results presented here can only reflect the condition of the vegetation at the time of the field visit.

Assumptions and limitations out of the Heritage impact assessment

Ground visibility was impaired by a thick cover of grass in many places. It is possible that over many years surface discard of artefacts and manufacturing waste were likely to have been covered by the windblown sand. This possibility is with reference especially to the deep sand beds in parts of the Farm Walton. The owner of the eastern portion of Erith reserved access to the property at short notice.

Assumptions and uncertainties out of the Palaeontological Impact Assessment

Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the quartzites, sandstones, shales and sands are typical for the country and do not contain fossil plant, insect, invertebrate and vertebrate material. The loose sands of the Tertiary and Quaternary period would not preserve fossils. Only palaeo-pans or palaeo-springs could preserve fossils but no such feature is evident.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not.

There are no significant reasons why the activity should not be authorised. However, if the proposed management and mitigation measures are not properly applied or if the prospecting operation intentionally disregards any of these measures, it will negatively affect the environment and have more long-term consequences. Therefore, the competent authority should take all the necessary steps to ensure that the prospecting operation complies with the conditions set out in the approval of the EMPR.

iii) Conditions that must be included in the authorisation.

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

The general conditions; including management of activity, monitoring, recording and reporting to the Department, commissioning of the activity, operation of the activity, site closure and decommissioning as well as non-compliances; as required in terms of the Environmental Impact Assessment Regulations promulgated in terms of NEMA (Act 107 of 1998) as well as objectives and requirements of relevant legislation, policies and guidelines must be included in the Authorization.

(2) Rehabilitation requirements

A Detailed rehabilitation plan is included in the EMPR as kieselguhr prospecting consist of continuous stripping and backfilling operations. The operation had to provide to the DMR, a financial rehabilitation guarantee to the amount as calculated in terms of the financial quantum Guideline and approved by the DMR.

Infrastructure areas

On completion of the prospecting operation, the various surfaces, including the access road, the office area, storage areas and the prospecting site, will finally be rehabilitated as follows: All other material on the surface will be removed to the original topsoil level where possible. This material will then be backfilled into any open pits. Any compacted area will then be ripped to a depth of 300mm, where possible, the topsoil or growth medium returned and landscaped.

All infrastructures, equipment and other items used during the operational period will be removed from the site.

On completion of operations, all buildings, structures or objects on the office site will be dealt with in accordance with regulation 44 of the Minerals and Petroleum Resources Development Act, 2002.

Topsoil and Stockpile Deposits:

Disposal Facilities: Waste material of all description inclusive of receptacles, scrap, rubble and tyres should be removed entirely from the prospecting area and disposed of at a recognized landfill facility. It should not be permitted to be buried or burned on the site.

Ongoing Seepage, Control of Rain Water:

Water Quality Management in accordance with the South African Water Quality Guidelines must be adhered to in order to provide timely and accurate water data to the Department of Water and Sanitation (DWS) as well as to manage impacts caused by the activity. Specific objectives of such a program are to:

- Determine whether water quality comply with water quality standards.
- Provide timely data for intervention as and when required.
- Assess the status of water quality in the surrounding areas.
- Provide analytical water quality information describing trends (present conditions and changes).

The objectives are to limit the adverse effect of pollutants in the water resource. The setting of in-stream Resource Water Quality Objectives (RWQO) is based on the South African Water Quality Guidelines.

Water Monitoring Points

Surface water: The study area does not comprise any natural wetlands, but Vlermuisleegte a non-perennial drainage channel flow through it. It will not be possible to take surface water samples as there will only be water available when it was raining for a very brief period of time.

Long Term Stability and Safety: It should be the objective of prospecting management to ensure the long-term stability of all rehabilitated areas including the backfilled depressions. This should be done by the monitoring of all areas until a closure certificate has been issued.

Final rehabilitation in respect of erosion and dust control: Self-sustaining vegetation will result in the control of erosion and dust and no further rehabilitation is deemed necessary, unless vegetation growth is not returned to a desirable state by the time of prospecting closure.

Final Rehabilitation Roads:

- After rehabilitation has been completed, all roads should be ripped or ploughed, fertilized and providing the landowner does not want them to

remain that way and with written approval from the Director: Mineral Development of the Department of Mineral Resources.

Submission of Information:

- Reports on rehabilitation and monitoring should be submitted annually to the Department of Mineral Resources – Kimberley, as described in Regulation 55 and NEMA (amended).

Maintenance (Aftercare):

- Maintenance after closure should include the regular inspection and monitoring and/or completion of the re-vegetation programme.
- The aim of the Environmental Management Programme is for rehabilitation to be stable and self-sufficient, so that the least possible aftercare is required.
- The aim with the closure of the prospecting operation should be to create an acceptable post-mine environment and land-use. Therefore, all agreed commitments should be implemented by Mine Management.

After-effects Following Closure:

Acid Mine Drainage: No potential for bad quality leachate or acid mine drainage development is associated with Kieselgurh prospecting closure.

Long Term Impact on Ground Water: No after effect on the groundwater yield or quality is expected.

Long-term Stability of Rehabilitated Land: One of the main aims of any rehabilitated ground should be to obtain a self-sustaining and stable end result. The concurrent monitoring of all material and replacement of topsoil where available should be ensured.

q) Period for which the Environmental Authorisation is required

5 years. With the option to renew for a further 3 years.

r) Undertaking

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

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

s) Financial Provision

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

i) Explain how the aforesaid amount was derived

The total cost to rehabilitate and mitigate the Alet Maritz Mynbou site as it stands currently (risking premature rehabilitation) is estimated to be R313,506 according to the DMR calculations.

ii) Confirm that this amount can be provided from operating expenditure

(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining Work Programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be)

It is confirmed that the amount for outstanding rehabilitation can be provided from operating expenditure.

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

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

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

Not applicable – No deviations from the methodology proposed in the Scoping Report.

ii) Motivation for the deviation

Not applicable – No deviations from the methodology proposed in the Scoping Report.

u) Other information required by the competent Authority

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

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

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

From a social perspective the following objectives and measures should be included as part of the Social Management Plan (SMP) as part of the Environmental Management Plan (EMP).

It should be noted that the responsibility of the mitigation lies with the owner, operator, and/or with the local municipality. The mitigation measures would have to form part of the respective stakeholder's expenditure predictions or operations and management within the area; therefore, the monitoring activities cannot be expressed in financial terms.

From a social perspective it can be concluded that the proposed Alet Maritz Project would not result in permanent damaging social impacts. The socio-economic benefits associated with the prospecting operation outweigh the negative social impacts. It is thus concluded that the proposed project is acceptable from a social point of view, provided that mitigation measures are implemented.

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

Heritage and Cultural Resources

Both a Heritage Impact Assessment and Palaeontological Desk Assessment and a Palaeontological Impact Assessment was conducted by Dr. E. Matenga and Dr. M. Bamford respectively.

Dr. Edward Matenga has been appointed by Alet Maritz Mynbou Pty Ltd to compile a Heritage Impact Assessment in order to determine whether there are any areas of heritage and cultural importance (Appendix 5).

This Heritage Impact Assessment (HIA) report has been prepared in support of a mine prospecting application on the Farm Walton and two portions of the Farm Erith near Kathu under the Gamagara Local Municipality in the Northern Cape Province.

The Applicant, Alet Maritz Mynbou (Pty) Ltd, intends to mine diatomaceous earth, a mineral derived from fossilised algae deposits. This report has been prepared following a site visit and ground survey on 6 July 2021.

The findings of the study may be summarised as follows:

Stone Age
Low density traces were found on the western portion of the Erith comprising scrapers and flakes on the surface, described as background scatter. No finds were recorded on the farm Walton.

Iron Age
No sites or relics dating to the Iron Age period were recorded.

Burial grounds
No graves or burial grounds were reported on the property.

Desk assessment of the likely heritage sensitivity of the eastern portion of Erith

While prior arrangements had been made for access to the eastern portion of Erith, the owner was in Kimberley as a result of a medical emergency. Regrettably he could not let the heritage team into his property in his absence. In the last resort, a desktop study has been conducted as follows:

The terrain features on both the eastern and western portions of the Farm Erith are basically similar including surface conditions and vegetation configuration. The findings of a ground survey, if it had been done, were not likely to turn out to be fundamentally different from what was encountered on the western portion of the farm. The farm is bisected by a shallow stream which also runs through the western portion Erith as well as the Farm Walton.

On a more general note, it is an established fact that Stone Age material is widely distributed on the plains, ridges and valleys of the upper Karroo area north of the Orange-Vaal basin. The material comprises scrapers, blades, cores and flakes typologically dating to the Middle Stone Age/Late Stone Age period. Early Stone Age material has been encountered in places with occasional occurrence of hand-axes and cleavers. The sparse occurrence of these finds has been described as background scatters, with few places identified as stone tool quarry or manufacturing sites. These finds have not warranted further action after documentation. Rock Paintings are not likely to occur on Erith as there are no hills or outcrops on the property.

Other heritage resources that might occur in the broader area
The following site types of heritage have been encountered in the locality and are therefore flagged:

- Buildings and objects associated with modern commercial farming from the 19th century
- Graves, burial grounds and human bones.

Postulated heritage sensitivity of the study area

The studies which have been undertaken in the locality provide a good theoretical foundation from which to extrapolate the more likely scenarios on the farm under study. The area was obviously home to MSA/LSA hunter gatherers who left behind the scatters of stone tools and flake waste. The MSA/LSA finds on the western portion of Erith and on the Farm Marsh 467, 10 km to the south, have not warranted further action beyond primary documentation. It can therefore be reasonably concluded that the material yield from the western portion of Erith will not be anything different from what has been encountered on these two neighbouring properties. This is a sound premise from which it is recommended that the mine prospecting should go ahead.

Conclusion and recommendations

In light of these findings, it is recommended that the mineral prospecting can go ahead. As a standard precaution, archaeological deposits are usually buried underground. If archaeological artefacts or skeletal material will be exposed in the area during construction, such activities should be halted, and the provincial heritage resources authority or SAHRA notified in order for an investigation and evaluation of the finds to take place.

ARCHAEOLOGICAL AND HERITAGE CHANCE FINDS PROCEDURE Prepared by Edward Matenga (PhD) Appendix 7 attached.

Alet Maritz Mynbou (Pty) Ltd has applied for a prospecting right on the Farm Walton and two portions of the Farm Erith near Kathu under the Gamagara Local Municipality in the Northern Cape Province. When the environmental and heritage approvals have been received prospecting operations will commence at which time the Archaeological and Heritage Chance Finds Procedure (CPF) will be applied as a manual for the protection of unidentified heritage resources which may occur in the footprint of the prospecting right, especially on the eastern portion of Erith where a ground survey was not undertaken.

HERITAGE SITES AND OBJECTS THAT MIGHT OCCUR IN THE AREA

The following site types/objects have been encountered in the broader region and are therefore flagged for possible occurrence on the east portion of Erith:

- Surface scatters or concentrations of stone tools of the ESA, MSA, LSA periods
- Substantial subsurface occurrences of stone tools
- Buildings and objects associated with modern commercial farming from the 19th century
- Graves, burial grounds and human bones.

GENERAL

A principal aim of the CFP is to raise awareness of all personnel in the project regarding the prospect of finding archaeological resources that unseen during the Phase 1 scoping heritage assessment and establish a protocol for the protection of these resources. The appointed Environmental Control Officer (ECO) and Site Manager keep copies of the CPF at the field offices. Training of field personnel on cultural heritage resources that might potentially be found on area should be provided.

PROCEDURE FOR ARCHAEOLOGICAL FINDS

If you discover what you suspect may be a possible archaeological site:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any archaeological remains that you may encounter.
- The finds must be reported to ECO or Site Manager
- The finds must be reported to the heritage authority, i.e. SAHRA and/or the provincial heritage resources agency.
- The heritage authority will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the potential significance of the finds are deemed to warrant further action and they cannot be avoided, then then heritage specialist will submit a report advising SAHRA accordingly.
- SAHRA will determine the appropriate course of action.

PROCEDURE FOR GRAVES, BURIAL GROUNDS AND HUMAN REMAINS

If you discover what you suspect may be possible human remains:

- Stop all work in the area to avoid damaging the site.
- Do not disturb any possible human remains that you may encounter.
- The finds must be reported to ECO or Site Manager.
- The finds must be reported to the local area station of SAPS.
- The finds must be reported to the SAHRA Burial Grounds and Graves (BGG) Unit.
- The BGG Unit will send a heritage specialist and /or ask the permit holder to appoint a heritage specialist to make a preliminary assessment of the findings.
- If the graves/human remains cannot be avoided SAHRA will require that the human remains be re-interred in a formal cemetery.
- Public participation to identify interested and affected parties (if any) will be undertaken in terms of NHRA Regulations 39, 41 and 41 in the Government Notice No R548 (year 2000).
- An application will be lodged to the BGG for the relocation of the human remains in terms of NHRA Regulations 34 in the Government Notice No R548 (year 2000).

- If the graves/ human remains must not be relocated, the BGG Unit may require that any damage done to the site is repaired and a 100m buffer zone is enforced around the site.

Palaeontological context

(AHSA) Archaeological and Heritage Services Africa (Pty) Ltd has appointed Dr. Marion Bamford to conduct a desktop study and compile a Palaeontological Impact Assessment for the prospecting right application on the farms Walton and Erith. The study can be found in Appendix 6.

A palaeontological Impact Assessment was requested for the proposed prospecting rights application on Farms Walton 390 and Erith 389 about 15 km north of Kathu and about 25 km west of Kuruman, Northern Cape.

To comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the proposed development.

The sites for prospecting lie on the ancient and non-fossiliferous strata of the Transvaal Supergroup (below ground), and the Quaternary aeolian sands that are potentially fossiliferous. Fossils could be found in palaeo-spring and palaeo-pan sites but none is visible from the satellite imagery. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. Based on this information it is recommended that no palaeontological site visit is required unless fossils are found once drilling or excavations for the prospecting activities have commenced.

The underlying Ongeluk Formation lavas and the Hotazel Formation iron and manganese deposits do not preserve fossils. Although the Mooidraai Dolomites (Fig 3) might preserve trace fossils of stromatolites, they seem to occur east of the site.

In the overlying Kalahari sands there is a chance that fossil may occur but only in certain features. Palaeo-pans and palaeo-springs are visible in satellite imagery because of their topography and often are associated with lunette dunes. Vegetation changes are also common. No such features are seen in the Google Earth images. Aeolian sediments that cover most of the region, do not preserve fossils because they have been reworked and windblown

The Kathu Complex includes the excavated sites of Kathu Pan1 (KP1), Kathu Townlands and Bestwood 1 (BW 1). At Kathu Pan, evidence of early hominin occupation has been observed at multiple locations within the pan, but ESA deposits have only been excavated at KP 1. Stratum 4a at KP1 was dated by a

combination of OSL and ESR/U-series to ca. 500 k BP. The lithic assemblage from St. 4a is characterized by a prepared core technology that produced both blades and points, and has been attributed to the Fauresmith industry. The lithic assemblage of the underlying St. 4b at Kathu Pan 1 is characterized by well-made handaxes, some bones and other tools (Beaumont, 2004; Walker et al., 2014; Lukich et al., 2020).

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are either much too old to contain fossils or have been wind transported. Only such geomorphological features such as palaeo-pans or paleo-springs might entrap fossils. No such feature is visible in the satellite imagery. Since there is an extremely small chance that fossils may be disturbed a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact to fossil heritage resources is extremely low.

Recommendation

Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the Quaternary aeolian sands. There is a very small chance that fossils may occur in pans or springs but none is evident. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr: if fossils are found once drilling or excavations for prospecting have commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample.

Chance Find Protocol

1. Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.
2. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
3. When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
4. Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the EMP's training and awareness plan and procedures.
5. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.

6. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
7. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
8. If no good fossil material is recovered then no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
9. If no fossils are found and the excavations have finished then no further monitoring is required.

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

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

There are no alternatives, as the application area applied for is the area where the applicant has an indication of kieselguhr and has found potential for a kieselguhr prospecting operation.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme

a) Details of the EAP (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required)

I hereby confirm that the requirement for the provision of the details and expertise of the EAP is already included in Part A as required.

b) Description of the Aspects of the Activity (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required)

I hereby confirm that the requirement for the aspects of the activity is already included in Part A as required.

c) Composite Map

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

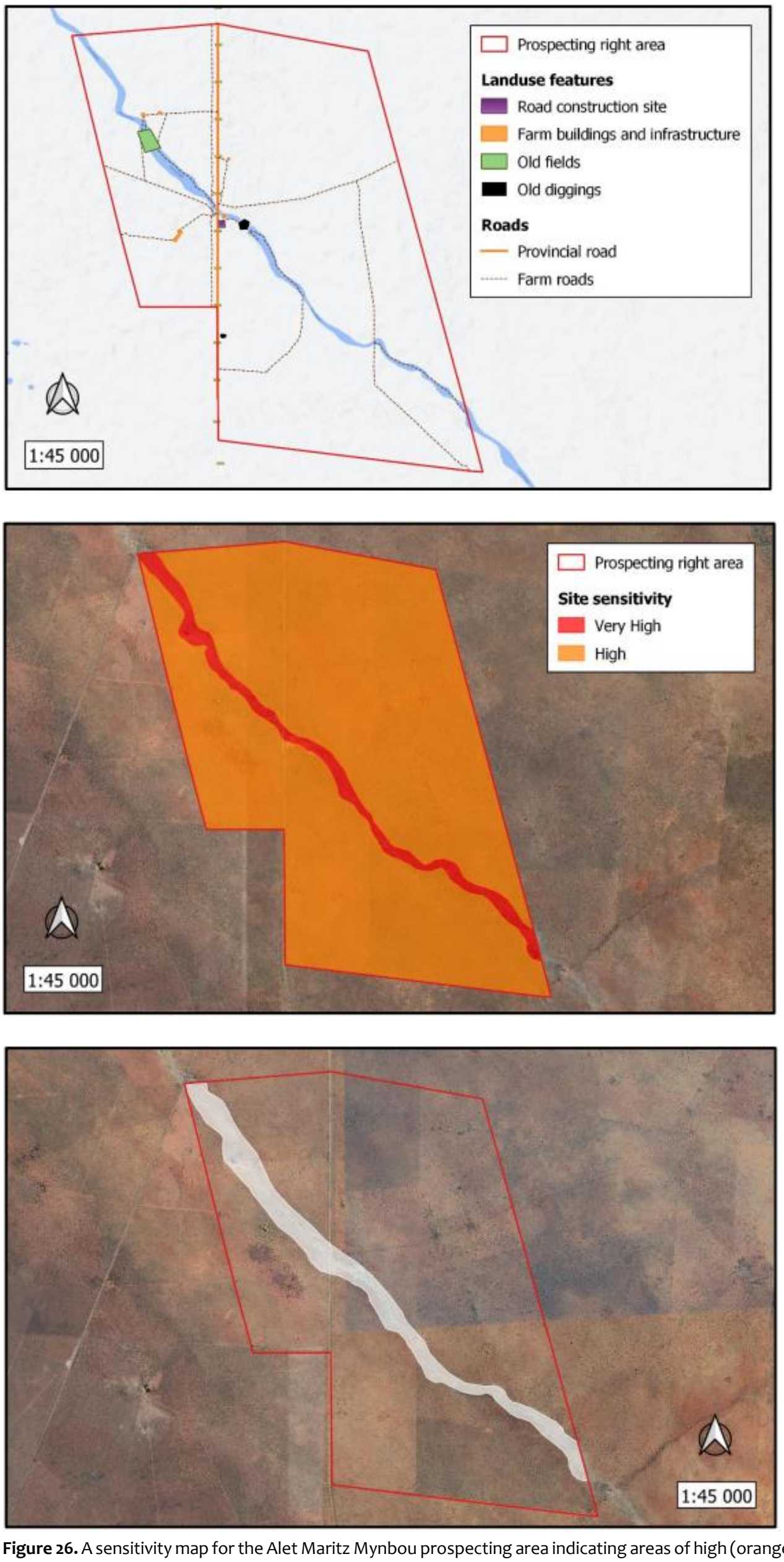


Figure 26. A sensitivity map for the Alet Maritz Mynbou prospecting area indicating areas of high (orange) and very high (red) sensitivity, the map with existing landuse features and the target areas for the prospecting operations.

d) Description of impact management objectives including management statements

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

The main closure objectives of the Company's planned prospecting operation are:

- To restore the site to its current land capability in a sustainable manner.
- To prevent the sterilization of any kieselguhr reserves.
- To prevent the establishment of any permanent structures or features.
- To manage and limit any impact to the surface and groundwater aquifers in such a way that an acceptable water quality and yield can still be obtained when a closure certificate is issued.
- To establish a stable and self-sustainable vegetation cover.
- To limit and rehabilitate any erosion features and prevent any permanent impact to the soil capability.
- To limit and manage the visual impact of the prospecting activities.
- To safeguard the safety and health of humans and animals on the site.
- To close the prospecting operation efficiently, cost effectively and in accordance with Government Policy.

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas should be left in a stable, self-sustainable state. Proof of this should be submitted at closure. Specific objectives include:

Rehabilitation of infrastructure areas

The objectives for the removal of infrastructure and the subsequent rehabilitation of the areas they occupied include:

- To ensure that infrastructure identified for removal is successfully demolished and removed.
- To ensure that infrastructure identified to remain after prospecting closure is maintained until the issue of a closure certificate.
- The removal, decommissioning and disposal of all prospecting infrastructure, will comply with all conditions contained in the MPRDA. To this end, decommissioning and rehabilitation of all infrastructure areas will follow the following principles:
- The associated disused infrastructure will be dismantled or demolished. Any building foundations will be removed and land exposed to the demolition and dismantling of infrastructure and all other disturbed land will be rehabilitated.

- Rubble will be disposed of at a suitable site. The site will be selected in consultation with DENC.
- Any surface water management infrastructure will be maintained to ensure they are stable and functional.
- Just before closure, when disturbed land has been rehabilitated and erosion is controlled by vegetation cover, all disused surface water management facilities will be decommissioned.

Maintenance

The necessary agreements and arrangement will be made by the Alet Maritz Mynbou operation to ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state or for three (3) years after closure or as long as deemed necessary at the time.

- Such processes include erosion of the rehabilitated areas, rehabilitated surfaces, surface water drainage, air quality, surface water quality, ground water quality, vegetative re-growth, weed encroachment.
- The closure plan will be reviewed yearly.
- Rehabilitation of the land will be maintained until a closure certificate is granted or until the land use is regarded as sustainable.
- All rehabilitated areas will be monitored and maintained until such time as required to enable the prospecting activity to apply for closure of these different areas.

Performance assessments

As per the MPRDA and associated Regulations, as well as NEMA and associated Regulations, this Environmental Management Programme will be continually assessed in terms of its appropriateness and adequacy. In order to achieve this, the Alet Maritz Mynbou operation will undertake the following:

- Implement the necessary monitoring programmes, as discussed as part of this EMPR;
- Conduct performance assessments of this EMPR biennially; and
- Compile and submit the afore-mentioned performance assessment reports to the DMR. The frequency of the performance assessments will be biennially. An independent and competent person will undertake all performance assessments.

Decommissioning and closure objectives

The key aim decommissioning and closure is to ensure that all the significant impacts are ameliorated. All rehabilitated areas will be left in a stable, self-sustainable state. Proof of this will be submitted at closure. Specific objectives include:

- To identify potential post-closure land uses in consultation with the surrounding land owners and land users. This should be done during the operational phase of the prospecting operation;
- Rehabilitate disturbed land to a state suitable for its post-closure uses;
- Rehabilitate disturbed land to a state that facilitates compliance with applicable environmental quality objectives;
- Keep relevant authorities informed of the progress of the decommissioning phase;
- Submit monitoring data to the relevant authorities;
- Maintain required pollution control facilities and rehabilitated land until closure.

Negative economic impacts

The objective is to alleviate the negative socio-economic impacts that will result from mine closure. Management principles to achieve this include:

- The Alet Maritz Mynbou operation will undertake a carefully planned step-wise decommissioning process.
- Closure planning will form an integral part of prospect planning.
- In conjunction with long-term closure planning, the operation will actively participate in regional and local planning to enhance the economic benefits of the project through development of alternative forms of income generation.
- The Alet Maritz Mynbou operation will initiate and participate in regional planning exercises that will mitigate the impacts of closure of the operation, the local and regional economies and associated abandonment of community infrastructures surrounding the prospecting activities.

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

There won't be a need for this, as based on the specialist reports. No pitting or trenching will go deep enough to encounter any groundwater.

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

No potential risk for Acid Mine Drainage exists.

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

Not applicable, there is no potential risk of acid mine drainage.

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

Not applicable, there is no potential risk of acid mine drainage.

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

There is no residual or cumulative impact that may result from acid mine drainage.

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

No Water is needed for the prospecting or bulk sampling of keiselgurh.

viii) Has a water use licence been applied for?

A Water use Licence application (WULA) will be prepared and submitted only for c and i uses.

ix) Impact to be mitigated in their respective phases

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

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.).	**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.
Ablution facilities Chemical toilets	Construction Commissioning Operational Decommissioning Closure	Chemical toilets for 30m^2	Maintenance of chemical toilets Removal of chemical toilets upon closure		Removal of chemical toilets upon closure of the Prospecting Right.
Clean & Dirty water systems: Berms	Construction Commissioning Operational Decommissioning	This area also includes the re-fuel and lubrication	Maintenance of berms and trenches Oil traps used in relevant areas.		Upon cessation of the individual activity (continuous rehabilitation)

	Closure	station, wash bay and office area.	Drip trays used. Immediately clean hydrocarbon spill.		
Fuel Storage facility (Diesel tanks) (Diesel car)	Construction Commissioning Operational Decommissioning Closure	Concrete, bricks, and steel	Maintenance of diesel car and bund walls. Oil traps Drip tray at re-fuelling point Immediately clean hydrocarbon spill.		Removal of diesel car upon closure of Prospecting Right.
Prospecting Area.	Commissioning Operational Decommissioning Closure	Provision is made for a maximum footprint (at full production) of ±10 hectares at any one time. Pits and trenches calculate to ±5ha	No dumping of materials prior to Proper planning of bulk sampling excavations Access control Dust control and monitoring Noise control and monitoring Continuous rehabilitation Stormwater run-off control Immediately clean hydrocarbon spill Drip trays Dump control and monitoring Erosion control		Upon cessation of the individual activity (continuous rehabilitation)

Salvage yard (Storage and laydown area)	Construction Commissioning Operational Decommissioning Closure	No construction material, area to be levelled with a grader and fenced with a gate and access control	Access control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill		Removal of fence around salvage yard and ripping of salvage yard area upon closure of the prospecting right.
Stockpile area	Commissioning Operational Decommissioning Closure	Provision is made for a maximum footprint (at full production) of 0.02ha for the stockpile area at any one time.	Dust control and monitoring Noise control and monitoring Drip trays Storm water run-off control. Immediately clean hydrocarbon spills. Rip disturbed areas to allow re-growth of vegetation cover		Ripping of stockpile area upon closure of prospecting right.
Waste disposal site (domestic and industrial waste):	Construction Commissioning Operational Decommissioning Closure	5m x 10m = 50m²	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals		Removal of waste receptacles, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right.
Roads (both access and haulage road on the mine site):	Construction Commissioning Operational Decommissioning Closure	Additional prospecting haul road	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits		Upon cessation of the individual activity (continuous rehabilitation)

			Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover		Ripping of roads upon closure of the prospecting right.
Workshop and Wash bay	Construction Commissioning Operational Decommissioning Closure	300m² Concrete and Steel	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills		Removal of wash bay equipment, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right
Water tanks:	Construction Commissioning Operational Decommissioning Closure	3m X 3m = 9m²	Maintain water tanks and structures		Removal of water tank and steel structure upon closure of the prospecting right.

e) Impact Management Outcomes

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

ACTIVITY **Whether listed or not listed.**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)….**	**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	**STANDARD TO BE ACHIEVED** **(impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.**
Ablution facilities Chemical Toilets	Soil contamination Possible Groundwater contamination	Soil Groundwater	Construction Commissioning Operational Decommissioning Closure	Maintenance of sewage facilities on a regular basis. Removal of chemical toilets on closure	Minimize the potential for a chemical spill on soil, which could infiltrate to groundwater.
Clean & Dirty water systems:	Surface disturbance Groundwater Contamination Soil contamination Surface water contamination	Soil Groundwater Surface Water	Construction Commissioning Operational Decommissioning Closure	It will be necessary to divert storm water around dump areas by construction of a cut-off berm that will prevent surface run-off into the prospecting area. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be	Safety ensured. Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

				rehabilitated by filling, levelling and re-vegetation where topsoil is washed away. Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill. Linear infrastructure such as roads will be inspected at least monthly to check infrastructure is effective in controlling erosion. Effluents and waste should be recycling and re-use as far as possible.	
Fuel Storage facility (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Soil Groundwater Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of Diesel car and bund walls. Oil traps Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution.	Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

	Surface disturbance			Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. All facilities where dangerous materials are stored must be contained in a bund wall. Vehicles and machinery should be regularly serviced and maintained.	
Prospecting Area	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface Water Topography Safety	Commissioning Operational Decommissioning Closure	Access control Dust control and monitoring Noise and vibration control and monitoring Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays Dump stability control and monitoring Erosion control Noise control	Safety ensured. Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

				Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. Prospecting activities must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type. Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. All those working on site must undergo environmental induction	

				with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring on site. The environmental induction should occur in the appropriate languages for the workers who may require translation. Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert. Employ measures that ensure adherence to the speed limit. Careful consideration is required when planning the placement for	

				stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimise the overall prospecting footprint. The Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting; Snares & traps removed and destroyed; and Maintenance of firebreaks. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away.	

Salvage yard (Storage and laydown area)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Fauna Flora Groundwater Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Access Control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill	Minimize potential for hydrocarbon spills to infiltrate into groundwater Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Kieselgurh Stockpile area	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Surface disturbance	Air Quality Fauna Flora Noise Soil Surface Water	Commissioning Operational Decommissioning Closure	Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

				Develop a mechanism to record and respond to complaints.	
Waste disposal site (domestic and industrial waste):	Groundwater contamination Contamination of soil Surface water contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Storage of Waste within receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals	Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met.
Roads (both access and haulage road on the prospecting site):	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air quality Fauna Flora Noise and vibration Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels;	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives met. Erosion potential minimized.

				Develop a mechanism to record and respond to complaints. Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	
Workshop and Wash bay	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills	Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Water distribution Pipeline which is not anticipated but is included for completeness should it become necessary	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Monitor pipeline for water leaks Maintenance of pipeline Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

Water tanks:	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Maintain water tanks and structures	Safety ensured. Rehabilitation standards and closure objectives to be met.

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraph (c)

ACTIVITY **Whether listed or not listed.**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)….**	**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	**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 kieselguhr prospecting as the case may be.**	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Ablution Facilities Chemical Toilets.	Soil contamination Groundwater contamination	Maintenance of sewage facilities on a regular basis. Removal of facility on closure	Removal of facility upon closure of the Prospecting Right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the

				contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Clean & Dirty water systems: Berms	Surface disturbance Groundwater Contamination Soil contamination Surface water contamination	It will be necessary to divert storm water around prospecting areas by construction of a berm that will prevent surface run-off into the prospecting area. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before	Upon cessation of the individual activity (continuous rehabilitation) Levelling of stormwater berms upon closure of Prospecting Right	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's

		vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away. Maintenance of trenches Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill. Linear infrastructure such as roads will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion. Confining works in specific area or season, restoration (and possibly enhancement) of disturbed areas, etc. Effluents and waste should be recycling and re-use as far as possible.		Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Fuel Storage facility (Diesel/ car)	Groundwater contamination Removal and disturbance of vegetation cover	Maintenance of Diesel car and bund walls. Oil traps Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over	Removal of diesel car upon closure of Prospecting Right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts;

	and natural habitat of fauna Soil contamination Surface disturbance	suitable drip trays to prevent soil pollution. Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. All facilities where dangerous materials are stored must be contained in a bund wall. Vehicles and machinery should be regularly serviced and maintained.		• Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Prospecting Area.	Dust Noise	Access control Dust control and monitoring Noise and vibration control and monitoring Continuous rehabilitation	Upon cessation of the individual activity (continuous rehabilitation)	The following must be placed at the site and is applicable to all activities: • Relevant Legislation;

	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Storm water run-off control Immediately clean hydrocarbon spill Drip trays Dump stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. Effluents and waste should be recycling and re-use as far as possible. Prospecting activities must be planned, where possible in order to encourage (faunal dispersal) and should minimise dissection or fragmentation of any important faunal habitat type. The extent of the prospecting area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). Appointment of a full-time ECO must render guidance to the		• Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Annual performance Assessment Reports and quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

		staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring on site. The environmental induction should occur in the appropriate languages for the workers who may require translation. Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert. Employ measures that ensure adherence to the speed limit.		

		Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimise the overall prospecting footprint. The Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting; Snares & traps removed and destroyed; and Maintenance of firebreaks. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away.		
Salvage yard (Storage and laydown area)	Surface Water contamination Groundwater contamination	Access Control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill	Removal of fence around salvage yard and ripping of salvage yard area upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations

	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination			• COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Stockpile area	Surface Water contamination Removal and disturbance of vegetation cover		Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized

	and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination		Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints.	Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Waste disposal site (domestic and industrial waste):	Groundwater contamination Surface Water contamination Contamination of soil Surface water contamination	Storage of Waste within receptacles Storm water control Ground water monitoring Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals	Removal of waste receptacles, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan.

				• Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Roads (both access and haulage road on the prospecting site):	Dust Surface Water contamination Groundwater contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Develop a mechanism to record and respond to complaints. Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water	Upon cessation of the individual activity (continuous rehabilitation) Ripping of roads upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees.

		management infrastructure is effective in controlling erosion.		• The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Workshop and Wash bay	Surface Water contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills	Removal of wash bay equipment, breaking and removal of rubble from the concrete floors and bund walls upon closure of prospecting right	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the contents of these documents and to adhere thereto.

				• Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Water distribution Pipeline which is not anticipated but is included for completeness should it become necessary	Surface disturbance	Monitor pipeline for water leaks Maintenance of pipeline Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	Removal of pipeline upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's Management and staff must be trained to understand the

				contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.
Water tanks:	Surface disturbance	Maintain water tanks and structures	Removal of water tank and steel structure upon closure of the prospecting right.	The following must be placed at the site and is applicable to all activities: • Relevant Legislation; • Acts; • Regulations • COP's • SOP's

				Management and staff must be trained to understand the contents of these documents and to adhere thereto. • Environmental Awareness training must be provided to employees. • The operation must have a rehabilitation and closure plan. • Management and staff must be trained to understand the contents of these documents, and to adhere thereto. Biennial performance Assessment Reports and annual quantum Calculations must be done to ensure that the operation adheres to the contents of the EIA and EMPr documents.

i) Financial Provision

(1) Determination of the amount of Financial Provision

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

The key aim of decommissioning and closure is to ensure that all the significant impacts are ameliorated and that the environment is returned to its original state, based on the baseline information, as far as is practically possible. Therefore, all rehabilitated areas should be left in a stable, self-sustainable state and proof of this should be submitted at closure.

The baseline environmental information is usually determined by reviewing all applicable information available for the site and the overall region. This information is gathered through a combination of on-site observations, spatial information and specialist baseline studies. Information regarding current land uses and existing biophysical environment gathered from interested and affected parties during the public consultation process are also taken into consideration when describing the baseline environment.

General closure objectives include the following:

Adhere to all statutory and other legal requirements;

Identify potential post-closure land uses in consultation with the future landowner, surrounding land owners and land users; well in advance, before closure and preferably during the operational phase of the operation;

Remove, decommission and dispose all infrastructures, and ensure that these processed comply with all conditions contained in the MPRDA

Rehabilitate disturbed land to a state suitable for its post-closure uses, and which are stable, sustainable and aesthetically acceptable on closure;

Rehabilitate disturbed land to a state that facilitates compliance with applicable environmental quality objectives;

Physically stabilise remaining structures to minimise residual risks;

Ensure the health and safety of all stakeholders during closure and post closure and that future land users are not exposed to unacceptable risks;

To alleviate the negative socio-economic impacts that will result from closure;

Promote biodiversity and ecological sustainability as far as practically possible;

Keep relevant authorities informed of the progress of the decommissioning phase;

To ensure that all natural physical, chemical and biological processes for which a closure condition were specified are monitored until they reach a steady state, for two years after closure, or for as long as deemed necessary at the time and to submit such monitoring data to the relevant authorities;

Maintain required facilities and rehabilitated land until closure.

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

Proof of consultation (attendance registers, minutes of meetings and response forms) is attached as Appendix '3'. The consultation process is ongoing.

An Advert (Notice) was placed in the Kathu Gazette on 24 April 2021 to notify all other interested and affected parties to come forward and register.

Registered consultation letters were sent to all interested and affected parties along with a copy of the Scoping Report (burned onto a disc) with registered mail on 13 April 2021. The document was also made available at the public library in Kathu.

Site Notices was also placed on the gates at the entrance of the proposed prospecting site on 16 April 2021 after consultation with the farm owners.

Furthermore, a Public Meeting was held on 18 August 2021 at the NG Kerk in Kathu. An advert was placed in the Kathu Gazette (13 August 2021) notifying all interested and affected parties and emails were send

to all registered interested and affected parties (10 August) of the meeting.

The EIA EMP document was also placed on a disc and send to all registered interested and affected parties by registered post or email for comments and concerns in October 2022.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The rehabilitation of land disturbed by the operation during the life of the Prospecting Right will be accompanied by ongoing monitoring of the environment, until a stable state is reached. The main objectives are to have an uncontaminated, rehabilitated and safe environment, and to restore the area and habitats to a condition acceptable for obtaining a closure certificate.

Final rehabilitation of the site is expected to be within 5 years after the right has been granted. Final rehabilitation will be executed systematically and will consist of the elements and procedures as listed below. More realistic closure elements will be fully determined by a Professional Mine Surveyor once the operation is active.

Dismantling of related structures:

- This includes related infrastructures, equipment, machinery and other items used during the prospecting activities.
- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition of steel buildings and structures:

- All steel buildings and structures are expected to amount to ±100 **m²**. These include mobile stores, workshops, offices, ablutions, water tanks, etc. Those in disuse and which cannot be sold, donated, or used for future purposes should be dismantled and removed or demolished.
- Any associated foundations associated with dismantled steel buildings and structures should also be demolished to 1 m below ground level;

- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition of reinforced concrete buildings and structures

- All brick buildings and concrete structures are expected to amount to ±100 **m²**. These include French drains, wash bays, refuelling depots and concrete floors. Those in disuse and which cannot be donated or used for future purposes should be demolished.
- The foundations of these buildings should also be demolished and to a depth of 1 m below ground level;
- The topography should then be restored to its natural contours, and any compacted area should be ripped to a depth no deeper than 300 mm;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Rehabilitation of access roads

- Prospecting roads in total, is expected to cover an area of 1 500 m² (0,15 ha). After general site rehabilitation has been completed, all redundant roads should be ripped or ploughed.
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Demolition and rehabilitation of electrified railway lines

- There are no electrified railway lines associated with the Prospecting activities.

Demolition and rehabilitation of non-electrified railway lines

- There are no non-electrified railway lines associated with the Prospecting activities.

Demolition of housing and/or administration facilities

- There are no other housing or administration facilities associated with the Prospecting activities, other than those in the form of mobile containers. These were however included in the section for demolition of steel buildings and structures.

Opencast rehabilitation including final voids and ramps

- Opencasts and ramps associated with the Prospecting activities are expected to cover ±10 ha in total but 1ha at any one time.
- In-filling of the pits should take place concurrently and by obtaining material from the closest adjacent excess material heaps;
- The topography should then be shaped to the natural contours;
- The prepared surfaces should finally be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation.

Sealing of shafts, adits and inclines

- There are no shafts associated with the Prospecting activities.

Rehabilitation of overburden and spoils

- The total final overburden and spoils are estimated to amount to 0.1 ha and includes waste dumps as well as earth walls. Pre-planning should be conducted in order decide the fate of these features. For example, if the material from these features will be used for in-filling, or if the features will remain after closure.
- The slopes of those features selected to remain after closure, should be downgraded to such an extent that they are not visually intrusive to the skyline after closure, and/or at least have an average outer slope of 1:3 (18°); or as predetermined by a specialist, depending on the type of material;
- The prepared surfaces should then be covered with 300 mm of topsoil or suitable growth medium, which includes a viable seed bank; in order to encourage restoration of natural vegetation, to ensure stability, improve the visual impact, and minimise erosion.

Rehabilitation of processing waste deposits and evaporation ponds with pollution potential

- No processing waste deposits and evaporation ponds with pollution potential are associated with the Prospecting activities.

Rehabilitation of processing waste deposits and evaporation ponds with no pollution potential

- The processing waste deposits on the Prospecting area is estimated to cover an area of 0 ha. No processing waste deposits is associated with kieselguhr.

Rehabilitation of subsided areas

The EAP is not currently aware of any areas of subsidence on site. However, any potential for such occurrences should be actively investigated and should be included in the rehabilitation plan, if and when such areas are identified.

General surface rehabilitation

- Final surface rehabilitation of areas disturbed by prospecting and related activities should be aligned to the selected final land use. General surface rehabilitation encompasses the reinstatement of natural topography, the top soiling and the re-vegetation of all those areas where infrastructure have been dismantled and removed or demolished. It also includes any industrial waste or scrap material that need to be removed from site. The total area that will need general surface rehabilitation at the time of Prospecting closure is estimated to be ± 0,5 ha.

River diversions

No river diversions are planned.

Fencing

It is not known at this stage if any fencing is planned.

Water management

No treatment of water will be necessary for the Prospecting activities.

Maintenance and aftercare

Maintenance and aftercare should be planned for two to three years after prospecting production have ceased and should include the following:

- Annual fertilising of rehabilitated areas.
- Monitoring of surface and subsurface water quality,
- Control of alien plants, and
- General maintenance, including rehabilitation of cracks and subsidence.

Specialist study

- A screening level risk assessment should be completed by a specialist environmental practitioner during the closure of the prospecting operation in order to ensure that all of the rehabilitation objectives have been met and that all of the potential risks have been eliminated and/or are controlled. This assessment should specifically emphasis on those risks relating to river disturbances, groundwater quality and slope stabilities, but should not neglect progress made in natural vegetation restoration or success in alien invasive eradications. The current average specialist fees are estimated at R 50 000.

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

The rehabilitation plan was primarily designed with the closure objectives in mind and therefore it relates to all the various objectives as set out above in Section 1) g) 1) a) of this EMPR. In general, the main objectives are to have an uncontaminated, rehabilitated and safe environment, and to restore the prospecting area to a condition acceptable for obtaining a closure certificate. Each and every element in the rehabilitation plan was designed in order to meet these closure objectives.

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

The current, preliminary prospecting closure and rehabilitation costs amounts to R 192 178 (Please see table 25 below for calculation).

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

It is hereby confirmed that the financial provision will be provided as determined.

Table 25: Financial Quantum

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
Remark:							
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	18,42	1	1	0
					1	1	
2 (A)	Demolition of steel buildings and structures	m2	50	256,63	1	1	12831,5
2(B)	Demolition of reinforced concrete buildings and structures	m2	50	378,15	1	1	18907,5
3	Rehabilitation of access roads	m2	1500	2,29	1	1	3435
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	445,73	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	243,13	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	513,26	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	1	261224,38	0,04	1	10448,9752
7	Sealing of shafts adits and inclines	m3	0	137,77	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,1	179372,28	1	1	17937,228
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	223404,93	1	1	0
					1	1	
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	648873,81	1	1	0
					1	1	
9	Rehabilitation of subsided areas	ha	0	150197,24	1	1	0
10	General surface rehabilitation	ha	0,5	142093,10	1	1	71046,55
11	River diversions	ha	0	142093,1	1	1	0
12	Fencing	m	0	162,08	1	1	0
13	Water management	ha	0	54027,79	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0,5	18909,73	1	1	9454,865
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum	0			1	0
					Sub Total 1		144061,6182
1	Preliminary and General		8643,697092		weighting factor 2 1		8643,697092
2	Contingencies				14406,16182		14406,16182
					Subtotal 2		167111,48
					VAT (15%)		25066,72
					Grand Total		192178

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

g) Monitoring of Impact Management Actions

h) Monitoring and Reporting Frequency

i) Responsible persons

j) Time Period for Implementing Impact Management Actions

k) Mechanisms for Monitoring Compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Topography	To minimise the reduction of land capability.	To ensure that rehabilitation post-prospecting slopes are stable, free draining and no slopes have an angle in excess of 20º.	Site Manager/ Environmentalists	Monitoring will be done on an *annual basis* to ensure that the levels and the slopes are in order.
Soil	To prevent soil pollution; To limit soil compaction; To curb soil erosion; and To reinstate a growth medium able to sustain plant life.	Soil depth and chemical composition will be tested and possible erosion damage will be assisted and rectified.	Site Manager/ Environmentalists	Monitoring will be done on an *annual basis* or after a heavy rain event.
Air Quality	To control the incidence of unacceptable levels of dust pollution on site.	To ensure that the prospecting operation minimizes dust omissions, so that dust does not become a nuisance for affected parties and a health hazard.	Site Manager/Foreman appointed SHE Consultant	Visual inspections will be done and managed by dust suppression by a water tanker. Quarterly tests will also be conducted by a Safety Health and Environmental Consultant and submitted to Mine Health and Safety for monitoring purposes.
Fauna	To minimise vegetation destruction in prospecting areas, and therefore a habitat for wildlife; and To eliminate poaching and the extermination of animal species within the boundaries of the study area as well as the surrounding areas.	To ensure that the species diversity and abundance is not significantly reduces.	Site Manager/ Environmentalists	Monitoring will be done at rehabilitated area on an *annually basis* to investigate species diversity and abundance.
Flora	To minimise the destruction of vegetation units; and To control invasion of exotic and invasive plant species.	To ensure that the rehabilitated areas become self-maintaining.	Site Manager/ Environmentalists	Monitoring will be done at the rehabilitated areas on a *twice a year basis* (mid-summer and mid-winter), where species diversity and vegetation cover will be investigated.

Noise and Vibration	To ensure that the legislated noise and ground vibration levels will be adhered to at all times. To control the incidence of unacceptable noise levels on site.	The management objective will be to reduce any level of noise, shock and lighting that may have an effect on persons or animals, both inside the prospecting and that which may migrate outside the prospecting area.	The engineer during the construction phase and the responsible person (Engineering/ Environmental Department) during the Operational phase of the project. The site engineer and independent qualified environmental noise and vibration specialist.	Quarterly reports on fall-out noise monitoring will be conducted as required by legislation. If any complaints are received from the public or state department regarding noise levels the levels will be monitored at prescribed monitoring points.
Surface Water	To conserve water; and To eliminate the contamination of run-off.	There are no sources in the vicinity of the prospecting area. The only non-perennial stream will not be monitored by collecting surface water samples during the rainy season.	Site Manager/Water Supply	The study area does not comprise any natural wetlands, but Vlermuisleegte a drainage channel runs through the application area.

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

Auditing of compliance with environmental authorisation, the environmental management programme and the closure plan should be conducted biennially by an independent EAP and an Environmental Audit Report should be compiled in such a way that it meets the requirements in terms of Regulation 34 of the National Environmental Management Act 107 of 1998): Environmental Impact Assessment Regulation, 2014.
The rehabilitation plan should also be reviewed biennially in order to fulfil the requirements of Section 41(3) of the MPRDA and should be conducted by an independent EAP. Subsequently, an Annual Rehabilitation Plan should be developed to meet the various requirements set out in the National Environmental Management Act (No 107 of 1998) (NEMA) Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).
These reports should be submitted biennially to the Northern Cape DMR offices in Kimberley.

m) Environmental Awareness Plan

The objective of the environmental awareness plan is to ensure that:

- Training needs are identified and all personnel whose work may create a significant impact upon the environment have received appropriate training;
- All employees are aware of the impact of their activities
- Procedures are established and maintained to make appropriate employees aware of:
    - The significant environmental impacts (actual or potential) of their work activities and environmental benefits of improved personal performance,
    - Their roles and responsibilities in achieving conformance with environmental policies, procedures, and any implementation measures,
    - The potential consequences of departure from specified operating procedures.
- Personnel performing tasks, which can cause significant environmental impacts, are competent in terms of appropriate education, training and / or experience.

Environmental awareness will be part of the existing training and development plan. Key personnel with environmental responsibilities will be identified and the following principles will apply:

- Procedures will be developed to facilitate training of employees, on-site service providers and contractors;
- Environmental awareness will focus on means to enhance the ability of personnel and ensure compliance with the environmental requirements;

Top management will build awareness and motivate and reward employees for achieve environmental objectives;

- Environmental policies will be availed to prospecting employees and contractors;
- Environmental inductions will be conducted for employees, contractors and visitors;
- There will be an ongoing system of identifying training needs.

General environmental awareness training as part of the induction at the Alet Maritz Mynbou operations should focus on the following:

- General environmental awareness
- The policies and vision concerning environmental management
- Legal requirements
- Prospecting activities and their potential impacts
- Different management measures to manage identified impacts
- Prospecting personnel's role in implementing environmental management objectives and targets.

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

It is the responsibility of management to ensure that all employees, contractors and visitors are trained to understand the impacts of their tasks on the environment and to reduce them wherever possible. Environmental awareness should be part of the existing training and development plan. Key personnel with environmental responsibilities should be identified and the following principles should be applied:

- Procedures should be developed to facilitate training of employees, on-site service providers and contractors;
- Environmental awareness should focus on means to enhance the ability of personnel and ensure compliance with the environmental requirements;
- Top management should build awareness and motivate and reward employees for achieving environmental objectives;
- There should be an ongoing system of identifying training needs.
- An environmental, health and safety induction programme should be provided to all employees, contractors and visitors prior to commencing work or entering the site, and they should sign acknowledgement of the induction. An attendance register and agenda/programme should be filed for each induction.
- A daily "toolbox talk" should be held prior to commencing work, which will include discussions on health, safety and environmental considerations. The toolbox talks should be led by the site manager or the appointed supervisor/s.
- Refresher training should also be given to permanent employees and long-term contractors on an annual basis, to ensure that all are competent to perform their

duties, thereby eliminating negative impacts on their safety, health and environment.

General environmental training as part of the induction at the Alet Maritz Mynbou operation should focus on the following:

- General environmental awareness, which incorporates environmental, ecological and heritage elements;
- The policies and vision concerning environmental management;
- Legal requirements;
- Prospecting activities and their potential impacts;
- Different management measures to manage identified impacts;
- Prospecting personnel's role in implementing environmental management objectives and targets.

Environmental awareness topics to be covered in training should include:

- Natural resource management and conservation;
- Biodiversity awareness and conservation principles;
- Heritage resource awareness and preservation principles;
- Hazardous substance use and storage;
- Waste management; and
- Incident and emergency actions and reporting;

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

Environmental incident reporting will be a vital part of communication in order to deal with risks and ultimately avoid pollution or the degradation of the environment. Such communication should take place through the management, administrative and worker sectors of the operation, as well as contractors and visitors. Employees should be required to report any and all environmentally related problems, incidents and pollution, so that the appropriate mitigation actions can be implemented timeously. In the event of an environmental incident, the reporting procedure as indicated in the table below should be followed.

ENVIRONMENTAL INCIDENT REPORTING STRUCTURE	ACTIONS REQUIRED
Person causing or observing the incident	The first person causing or observing the incident shall report the incident to an immediate supervisor where the environmental incident is observed.
Line management in the relevant area of responsibility where the incident occurred	Line management in the relevant area of responsibility where the incident occurred shall: • Investigate the incident and record the following information: - How the incident happened; - The reasons the incident happened; - How rehabilitation or clean up needs to take place; - The nature of the impact that occurred; - The type of work, process or equipment involved; - Recommendations to avoid future such incidents and/or occurrences; • Inform the environmental manager/ECO and the Operations Manager on a daily basis of all incidents that were reported on site; • Consult with the relevant department/person for recommendations on actions to be taken or implemented where appropriate (e.g. clean-ups). • Assist the Environmental Manager and/or Operations Manager with applicable data in order to accurately capture the incident into the reporting database; • Ensure that remediation measures are implemented as soon as possible.
Site managers	The site managers shall: • Forward a copy of the incident form to other line managers; • Forward a copy of the incident form to the Environmental manager/ECO;

	• Inform the relevant department/person on a weekly basis of the incident by e-mail or by submitting a copy of the incident report. Once a High-Risk Incident (any incident which results from a significant aspect and has the potential to cause a significant impact on the environment) occurred it must be reported immediately to the Environmental Manager and the Operations Manager by telephone or email to ensure immediate response/action. • Forward a copy of the completed Incident Reporting Form (and where applicable a copy of the incident investigation) to the relevant department/person.
Environmental manager/ECO	The appointed environmental manager or ECO shall: • Complete an incident assessment form to assess what level of incident occurred; • Make recommendations for clean-up and/or appropriate alternate actions; • Enter actions necessary to remediate environmental impacts into the database in conjunction with the responsible line manager; • Enter the incident onto the database in order to monitor the root causes of incidents; • Include the reported incidents in an appropriate monthly/quarterly report; • Highlight all incidents for discussion at HSEC meetings.

n) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually)

According to Section 41(3) of the MPRDA the holder of a prospecting right must annually assess (and revise, if necessary) the total quantum of environmental liability for the operation and ensure that financial provision is sufficient to cover the current liability (in the event of premature closure) as well as the end-of-operation liability.

An Annual Rehabilitation Plan should be developed to match the various requirements set out in the NEMA regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).

An environmental audit report will be done biennially (every second year).

Officials in the DMR Regional Offices are required to assess, review and approve the quantum of financial provision submitted (that is, the monetary value of the financial provision that has been computed by the holder of a prospecting right, mining right or mining permit during the annual review) as being sufficient to cover the environmental liability at that time and for closure of the site at that time.

It is hereby confirmed that the financial provision shall be reviewed annually.

2) UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports;

b) the inclusion of comments and inputs from stakeholders and I&APs;

c) the inclusion of inputs and recommendations from the specialist reports where relevant; and

d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.

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Signature of the Environmental Assessment Practitioner:

Wadala Mining and Consulting Pty Ltd

_____

Name of Company:

Date: 30 August 2023

- END –

APPENDIX 3 PUBLIC PARTICIPATION