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) 30/5/1/1/2/12782 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 Farm Gamahuli No. 495; Remaining Extent of the Farm Malley No. 498 (5 179.1449 Ha in extent) and the Farm La Rochelle No. 359 (1 915.3412 Ha in extent) located in the Administrative District of Kuruman in the Northern Cape Province. **Farm No: 495** Farm Name: Gamahuli, Portion 0 Administrative District: Kuruman Province: Northern Cape Title Deed No: T1212/1999 Extent: 2 542.5125 ha Owner: Pieter Thomas Sweetnam **Farm No: 498** Farm Name: Malley, Portion 0 (Remaining Extent) Administrative District: Kuruman Province: Northern Cape Title Deed No: T1/2007 Extent: 2 636.6324 ha Owner: Jacobus Lukas van der Merwe **Farm No: 359** Farm Name: La Rochelle, Portion 0 Administrative District: Kuruman Province: Northern Cape Title Deed No: T1089/1969 Extent: 1 915.3412 ha Owner: Johannes Stephanus Jordaan
Application area (Ha)	7 094.4861 ha (seven thousand and ninety-four comma four eight six one hectares)
Magisterial district:	Kuruman, Northern Cape Province
Distance and direction from nearest town	The prospecting right area is located within the Postmasburg and Kuruman District Municipalities of the Northern Cape Province. It is split into two separate portions, with neighbouring farms Gamahuli and Malley lying approximately 41 km north-west of the town Olifantshoek on a gravel road that turns off from the N14 and leads to Van Zylsrus (Figure 1). The isolated farm, La Rochelle, is located further north-east and lies approximately 65 km north-west of the town Kathu on a private road that turns off from the gravel road which connects Kathu and Deben with Hotazel (Figure 1).
21-digit Surveyor General Code for each farm portion	**Farm No: 495 (The Farm Gamahuli No. 495)** C04100000000049500000 **Farm No: 498 (Remaining Extent of the Farm Malley No. 498)** C04100000000049800000 **Farm No: 359 (Farm La Rochelle No. 359)** C04100000000035900000

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

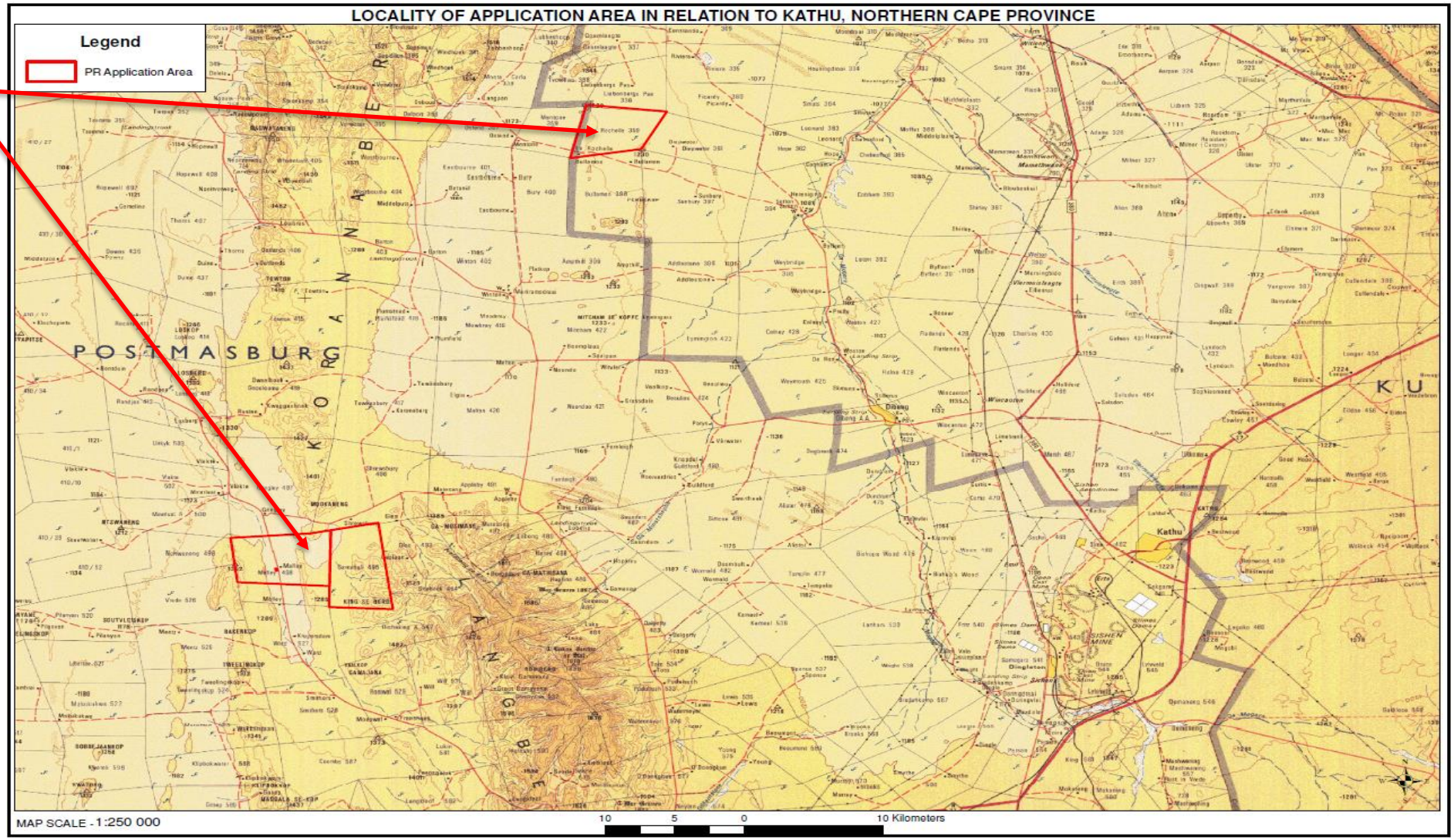


Figure 1. 1: 250 000 Topocadastral map KIMBERLEY 2824 indicating the application area with RED BLOCKS.

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

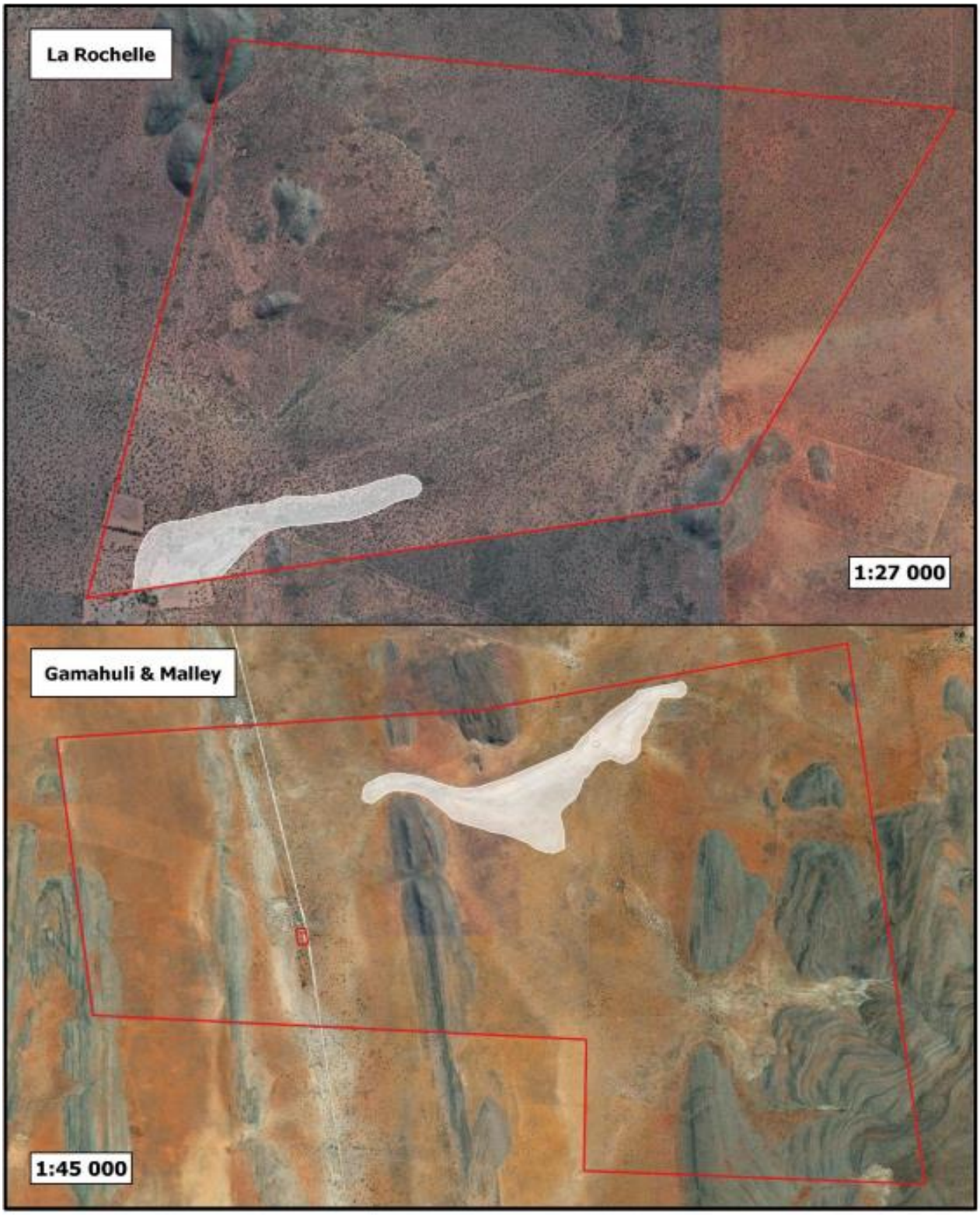


Figure 2. The proposed core footprint of prospecting activities in the study area is indicated in white.

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 of NEMA Listing Notice 1: "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 of NEMA Listing Notice 1: "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 of NEMA Listing Notice 1: 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 –	~7094.4861ha The total area will NOT be prospected. The target areas make up less than 25% of the properties.	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 300 pits 2m X 3m X 0.5 - 5m 50 trenches 100m X 50m X 0.5 – 5m = 25.18 ha Pits that prove to contain kieselguhr (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 15 of NEMA Listing Notice 2 The clearance of an area of 20 hectare or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- (i) The undertaking of a linear activity; or	A total of 25 hectares will be physically disturbed were the kieselguhr material will be removed.	X	NEMA: LN2 (GNR325)

(ii) Maintenance purposes undertaken in accordance with a maintenance management plan.			
Activity 19 of NEMA Listing Notice 2: 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 (Kieselguhr) and requires permission in terms of Section 20 (MPRDA), for the removal and disposal of bulk samples of any minerals.	~7094.4861ha. Although the total area will never be prospected and the footprint with the bulk sampling is calculated to be ±25ha.	X	NEMA: LN2 (GNR325)
(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 Concrete bund walls and diesel depots Ablution facilities Topsoil stockpiles Overburden stockpiles	± 200 m^2 ± 300 m^2 ± 2 00 m^2 ± 250 m^2 ± 30 m^2 ± 300 m^2 ±300 m^2		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 = 50m^2		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)

The entire proposed prospecting project 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.

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.

i. Description of planned activities

DESCRIPTION OF PLANNED NON-INVASIVE ACTIVITIES:

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

PHASE 1:

Desktop Study

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. Contacts between various lithologies will be mapped and specific attention will be given to delineate and define areas underlain by kieselguhr.

DESCRIPTION OF PLANNED INVASIVE ACTIVITIES:

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

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

300 pits of 2m X 3m X 0.5 - 5m

50 trenches of 100m X 50m X 0.5 – 5m

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.

ii. Infrastructure

No known infrastructure except farm roads will be affected by prospecting activities.

The following equipment will be temporarily installed as part of the second and third phase of prospecting activities.

1 x 40-t Articulated Dump truck
1 x Excavator
1 x Front-end loader

All temporary infrastructures, equipment and other items used during the proposed prospecting period will be removed from the site at the end of the prospecting period.

No ESKOM power will be available on the site. All prospecting will be done with gensets.

iii. Rehabilitation

The prospecting method involves a continuous backfilling open cast process in the bulk sampling phase. Topsoil will be stripped and hauled to already backfilled areas. If there are no backfilled areas available immediately, topsoil will be temporarily stockpiled on the surface for later use. No materials will be permanently dumped on the surface. Excavated material that will not be tested will be backfilled into the already prospected areas and will be covered with the overburden and topsoil that has been allocated for this purpose.

On completion of the prospecting operation, the various surfaces, including the access road, the office area, storage areas will finally be rehabilitated as follows: All material on the surface will be removed to the original topsoil level where possible. This material will then be backfilled into the open pits or trenches. 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 prospecting period will be removed from the site.

iv. Water

Surface Water

The processing process does not require the use of water and therefore no water will be abstracted from surface water sources. However, water will be abstracted from a borehole to be used as drinking water or transported to site daily during prospecting operations.

v. Waste Management

Proper sanitation facilities will be provided for employees. 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 twice a month. 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.

vi. Access Roads

The properties Gamahuli and Malley lying approximately 41 km north-west of the town Olifantshoek on a gravel road that turns off from the N14 and leads to Van Zylsrus. The isolated farm, La Rochelle, is located further north-east and lies approximately 65 km north-west of the town Kathu on a private road that turns off from the gravel road which connects Kathu and Deben with Hotazel. Activities associated with the prospecting 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) 30/5/1/1/2/12782 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) - Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations)	- Control measures are to be implemented upon the approval of the EMPR.

	- 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 DMRE 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 * Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 *	- A permit application regarding protected plant species needs to be lodged with DENC if any protected species is encountered. Control measures are to be implemented upon the approval of the EMPR.

	- 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 2014 in terms of NEM:WA (Contaminated land regulations)	- To be implemented upon the approval of the EMPR.

	- 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 needs 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 formal cemetery administered by a local authority. - Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered	- Control measures are to be implemented upon the approval of the EMPR. Fossil finds procedure are attached to the PIA.

	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) - Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams)	- A water use application will be submitted only for section 21 (c) and (i) Uses. - Control measures are to be implemented upon the approval of the EMPR.

	- 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 and hunting. The land capability for most of the study area is non-arable, with moderately low potential for grazing and wildlife, while the hills are classified as wilderness with very low land use potential. The agricultural region is demarcated for cattle farming, with the grazing capacity estimated at 13 Ha/LSU (on La Rochelle) and 15 Ha/LSU (on Gamahuli and Malley). The study area is not suitable for crop irrigation. Currently, the farms are primarily utilised as natural pastures for domestic livestock. Some areas have been subject to small-scale historic diggings and irrigation. Existing infrastructure include roads, homesteads, farm buildings and dams.

The areas applied for is over the farm Gamahuli, the remaining extent of the farm Malley and the farm La Rochelle and 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 property on which or location where it is proposed to undertake the activity:

The Farm Gamahuli No. 495 ; Remaining Extent of the Farm Malley No. 498 (5 179.1449 Ha in extent) and the Farm La Rochelle No. 359 (1 915.3412 Ha in extent) located in the Administrative District of Kuruman in the Northern Cape Province.

The properties on which the Prospecting Right was applied for is determined by the possible geological location of the mineral resource. Therefore, there are no alternatives for the location of the activity, except for not proceeding with the operation. This will however cause the underutilisation of a national economic resource.

The area is accessible via gravel roads from different directions.

Alternatives considered: -

As the area covered under the Prospecting Right had been selected based on the assumption of possible kieselguhr reserves and indication of the presence of diatomaceous earth, it will not be viable to consider an alternative site for the prospecting. Alternatives for land are thus not available, as the Prospecting Right application cannot be considered over another area.

Therefore, there are no alternatives to the area.

(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 of 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.

Land Use

The major land uses in the region include activities related to agriculture and hunting. The land capability for most of the study area is non-arable, with moderately low potential for grazing and wildlife, while the hills are classified as wilderness with very low use potential. The agricultural region is demarcated for cattle farming, with the grazing capacity estimate at 13 Ha/LSU (on La Rochelle) and 15 Ha/LSU (on Gamahuli and Malley). The study area is not suitable for crop irrigation. Currently, the farms are primarily utilised as natural pastures for domestic livestock. (Information taken out of the ecological study by Boscia Ecological Consultants Dr. Betsie Milne).

It would however be feasible to determine if there are 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. There will be infield screening to ensure that all oversize material is deposited back into the pits and trenches. This material should be covered with the overburden (where available), and topsoil that has been previously put aside for this purpose. The post-prospecting land use should be determined so that the developments strategies of the farm can still continue beyond the prospecting and mining of the area should the area be viable for mining.

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

Prospecting Method
The prospecting method of open pits and trenches with continued backfilling is the only economic viable method currently being used by the kieselguhr fraternity. There is no alternative prospecting method for the prospecting of kieselguhr.

Socio-Economy
The prospecting plan is to employ ±10 - 15 people. The non-approval if this prospecting operation would impact negatively on the employment rate for the Kathu and Olifantshoek areas and the families who are likely to benefit from the positive employment opportunities. Substantial tax benefits to the State and Local Government will also be lost.

Biodiversity
The implementation of the prospecting 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
In the event that the prospecting operation does not proceed, the heritage resources will remain as is. The protection and preservation of these resources are therefore not guaranteed. However, if the prospecting operation is approved, the heritage resources will be protected through the demarcation of no-go zones and fencing off if any of these resources are encountered.

(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-perennial drainage lines and wind direction), heritage resources and discussions with the relevant Departments.

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

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

- 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.

- Fuel Storage facility (Concrete Bund walls and Diesel tanks):
  A diesel car is the only fuel storage that is taking place on the application area.

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

- 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. The current access road is deemed adequate for a service road into the prospecting site.

- Salvage yard (Storage and laydown area).

- Residue Stockpile area.

- 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.

- 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 infield screening activities, but the best viable long-term option is the instalment of fuel tanks within a concrete bund wall. However, due to the size of the operation, mobile tanks will be used for the Alet Maritz operation.

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 sites (Gamahuli and Malley) do have non-perennial drainage lines which may contain water during heavy rainfall events, but this is very unlikely since the sites are located in an arid region.

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 up to bedrock, stockpiled next to an open area and 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 kieselguhr is removed from the site, primary processing of the product takes place and samples are removed for testing of quality and quantity or processed.

  Alternatives considered: -

  The planned prospecting activities include non-invasive and invasive methods. The operation is also associated with processing techniques that make use of modern technologies. These are the most economic viable method currently being used by the kieselguhr fraternity. There is no other feasible, alternative prospecting method for the prospecting and bulk sampling of kieselguhr.

(e) The operational aspects of the activity:

The topsoil will be removed and the Kieselguhr will be loaded with an excavator on to dump trucks for primary processing before 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 for bulk sampling. 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.

Socio-Economy

The operation will make provision for ±10 - 15 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

An ecological desktop study which includes biodiversity was done by Dr. Elizabeth (Betsie) Milne on the area (Appendix 4). When the final areas for pitting and bulk sampling have been identified, it will be vital to conduct a field assessment to assess the impacts related to these invasive activities on the ecological integrity of the final earmarked areas.

The proposed prospecting site falls within a critical biodiversity area, as defined by the Northern Cape Critical Biodiversity Areas Map (Holness and Oosthuysen, 2016). Although most of the site comprises *Other Natural Areas*, the hills are classified as *Ecological Support Areas*. No *Critical Biodiversity Area One-, Two, or Protected Areas* occur within the study area, but the Tswalu Kalahari Reserve, which lies north and west of the study area, is classified as a *Protected Area*, with its surrounding buffer as *Critical Biodiversity Area Two.*

The Mining and Biodiversity Guidelines (DENC et al, 2013) does not classify any section on Gamahuli and Malley to have biodiversity importance, and therefore does not constitute a high risk for mining, but it does classify the

north-eastern half of La Rochelle to have a *Moderate Biodiversity Importance*, which constitutes a moderate risk for mining. These guidelines were developed to identify and categorize biodiversity areas sensitive to the impact of mining to support mainstreaming of biodiversity issues in decision making in the mining sector.

None of the habitats in the study area have been identified as threatened ecosystems and no habitats on La Rochelle have been identified as ecological corridors within the John Taolo Gaetsewe District Municipality. However, the hills on Gamahuli and Malley have been classified to have *High Conservation Priority*, while the plains on these farms have *Medium Conservation Priority* within the ZF Mgcawu District Municipality.

The study area also falls within the core area of the Griqualand West Centre (GWC) of Endemism as defined by Frisby et al (2019). 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, Koranna-Langeberg Mountain Bushveld, and Olifantshoek Plains Thornveld vegetation is least threatened, with little transformation. However, mining has contributed significantly to habitat transformation in the region and this prospecting operation will further contribute to the cumulative impacts thereof.

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.

The findings of these studies indicated that the proposed prospecting operation will have very little impact, if any, on the heritage and palaeontological resources in the area. Dr. Matenga stated that some artifacts dating back to the Stone Age (all three epochs from the Earl Stone Age through the Middle Stone Age to the Later Stone Age) was found on the farm Malley along the quartzite ridge. These artifacts include hand-axes, a cleaver and a scraper as well as flake tools. However, there were no significant concentrations of artefacts to warrant further mitigation action.

Some buildings and structures were noted in all three the farms, however, the farmhouse, the principal dwelling structure, built in 1921 on the La Rochelle farm is of particular significance. The house is an exemplar of the architectural quality of houses in rural area at the time (1921). The house will not be affected by the project, neither are there any compelling circumstances for alteration or destruction of the building without permission being sought from the heritage authority.

Lastly Dr. Matenga noted the burial grounds on the farm La Rochelle. The graves are fenced off. As a standard precaution a 100m buffer will be reserved. If it become necessary for stated activities to be extended into the servitude, an application for a permit must be lodged with the heritage authority.

Furthermore, Dr. Bamford stated the chance of fossils occurring on any of the sites are highly unlikely since no palaeo-spring and palaeo-pan sites, which is usually associated with fossils, could be observed on the satellite imagery. 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. 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.

Should any other heritage or archaeological 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 process as described by NEMA for Environmental Authorisation was followed. See table 2 in Appendix 3 for the identification of Interested and Affected Parties to

be consulted with. The landowner, and or occupants and direct neighbours were consulted.

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.

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

Photo 1: Site notices placed at the entrances of the farm Gamahuli.

Photo 2: Notices at the farm entrance of the farm Malley.

Photo 3: Notices ate the entrances of the farm La Rochelle.

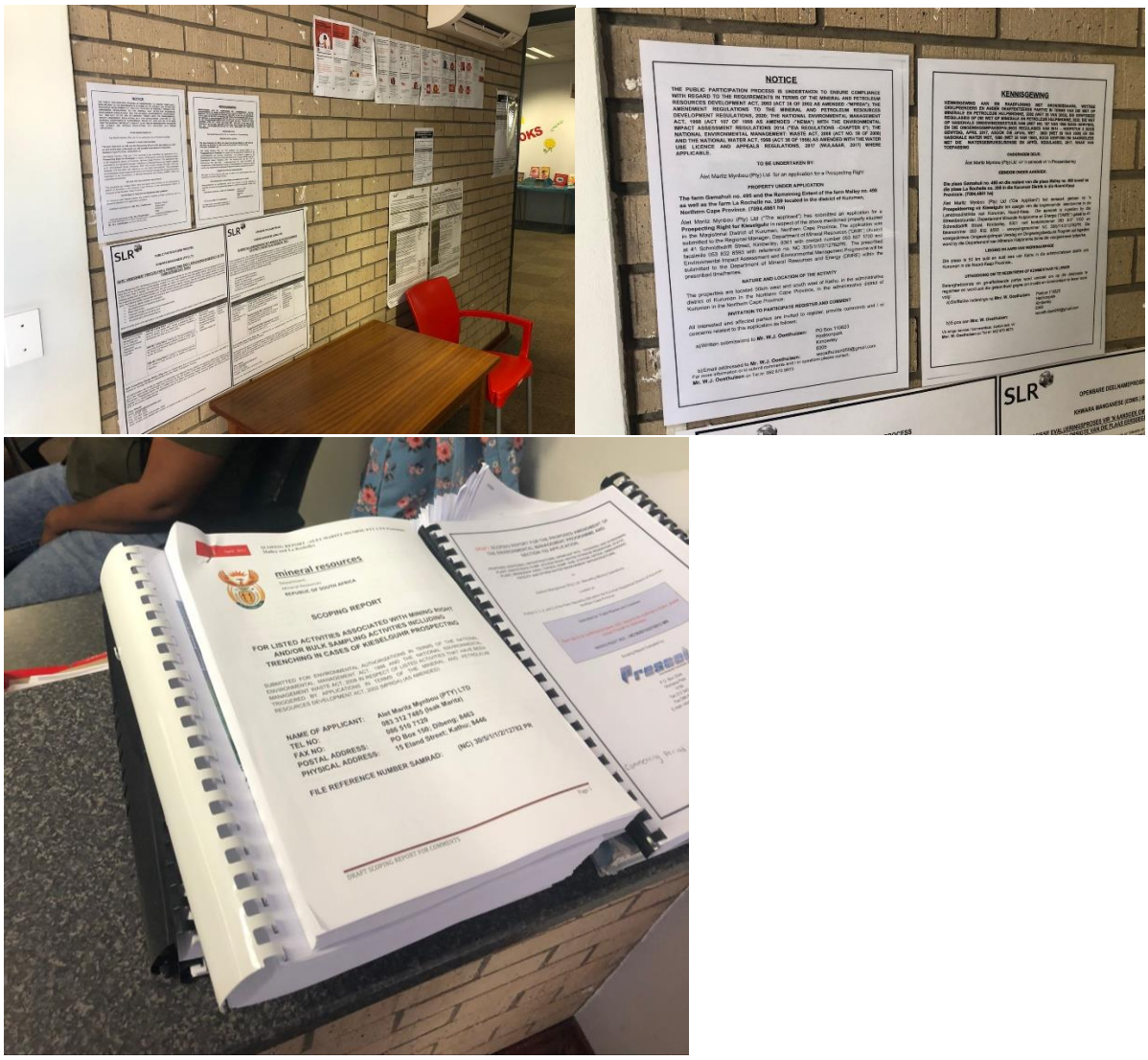


Photo 4: Notices put at the Kathu Library along with a copy of the Scoping Report.

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:*

According to Coetsee (1979) the geological features of the study area primarily comprise Quaternary deposits, intermixed with Mokolian deposits and a very small proportion of Vaalian deposits (Figure 3). Most of the study area comprises red to flesh-coloured wind-blown sand, with various quartzite formations belonging to the Volop Group (Griqualand West Sequence) protruding throughout the properties. A very small area in the south-east of La Rochelle comprises Lucknow Quartzite with subordinate limestone and shale of the Olifantshoek Group (Griqualand West Sequence) (Figure 3). The kieselguhr deposits on both properties are primarily associated with alluvials that have not been formally mapped.

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

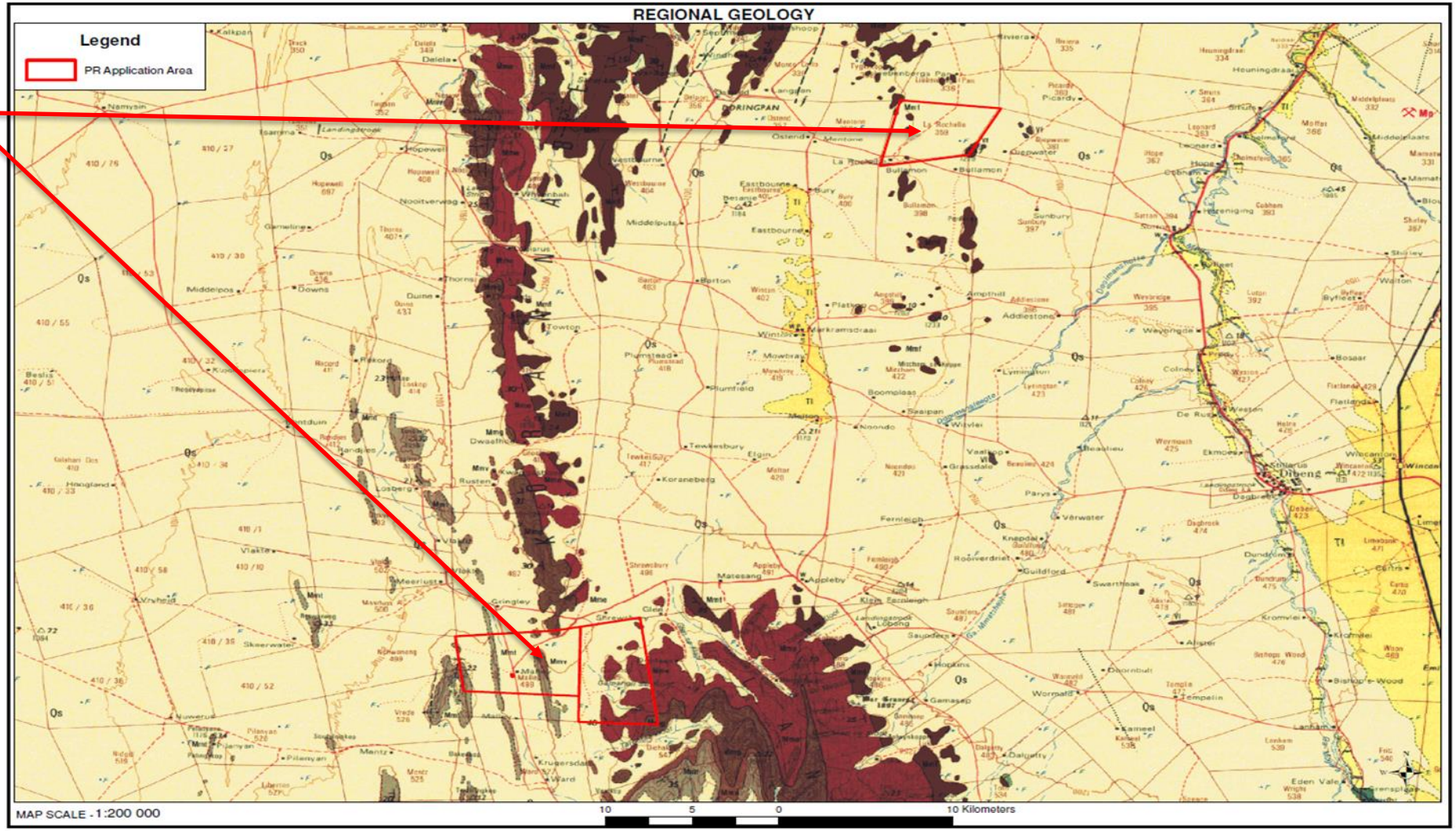


Figure 4. Map indicating the regional geology of the Prospecting right application area. Qs – Aeolian sand, flesh coloured; Tl – Surface limestone, sand, calcrete; Mmt – Quartzite with subordinate greywacke; Mmv – Quartzite with haematite nodules and lenses; Mmg – Subgreywacke; Mme – Quartzite with subgreyewacke (Ellies Rust Fm, Matsap Subgroup, Volop Group, Olifantshoek SG); Mmf – Quartzite and subgreywacke (Fuller Fm, Matsap Subgroup, Volop Group, Griqualand West)

(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 5 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.

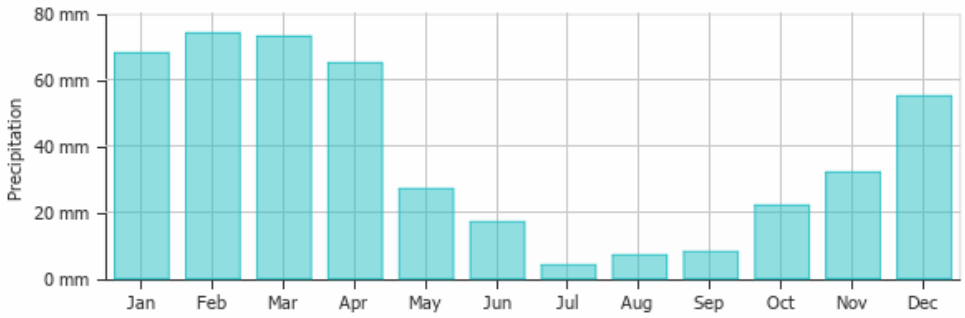


Figure 5. Monthly rainfall (mm) for Kathu (Source: Average monthly rainfall and snow in Kathu (Northern Cape), South Africa (millimeter) (weather-and-climate.com))

Temperatures

Monthly temperatures recorded at Kathu are presented in the table 3 below. November to March is the warmest, while June and July are the coldest.

Table 3: 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:

Regional Description

Dr. E. Matenga has been appointed by Wadala Mining and Consulting (Pty) Ltd to conduct a Heritage Impact Assessment. The following information was gathered from his HIA report (Appendix 5).

Malley and Gamauli lie on a sandveld on the wetter margins of the Kalahari Desert. On both farms an extensive flat terrain is broken by north-south quartzite ridges that are prominent in the landscape. Altitude ranges from 1 120 meter above sea level on the plains, to 1500 m on the hill tops (Dr. Milne, 2021 (Appendix 4)). The terrain across the plains is indicated by a very gentle slope of 1% but increases to 13% along the hill slopes (Dr. Milne, 2021 (Appendix 4)). The flat areas support a grassland and thick ground cover impairing visibility due to good rains in the past rainy season.

On the farm La Rochelle terrain features are basically similar to those observed on the other farms except for the absence trending hills. Instead, there are two prominent dome-shaped hills on the boundaries of the property. Another vegetation element is scattered mature camel thorn trees (Acacia erioloba) which provide visual breaks in the flat landscape.

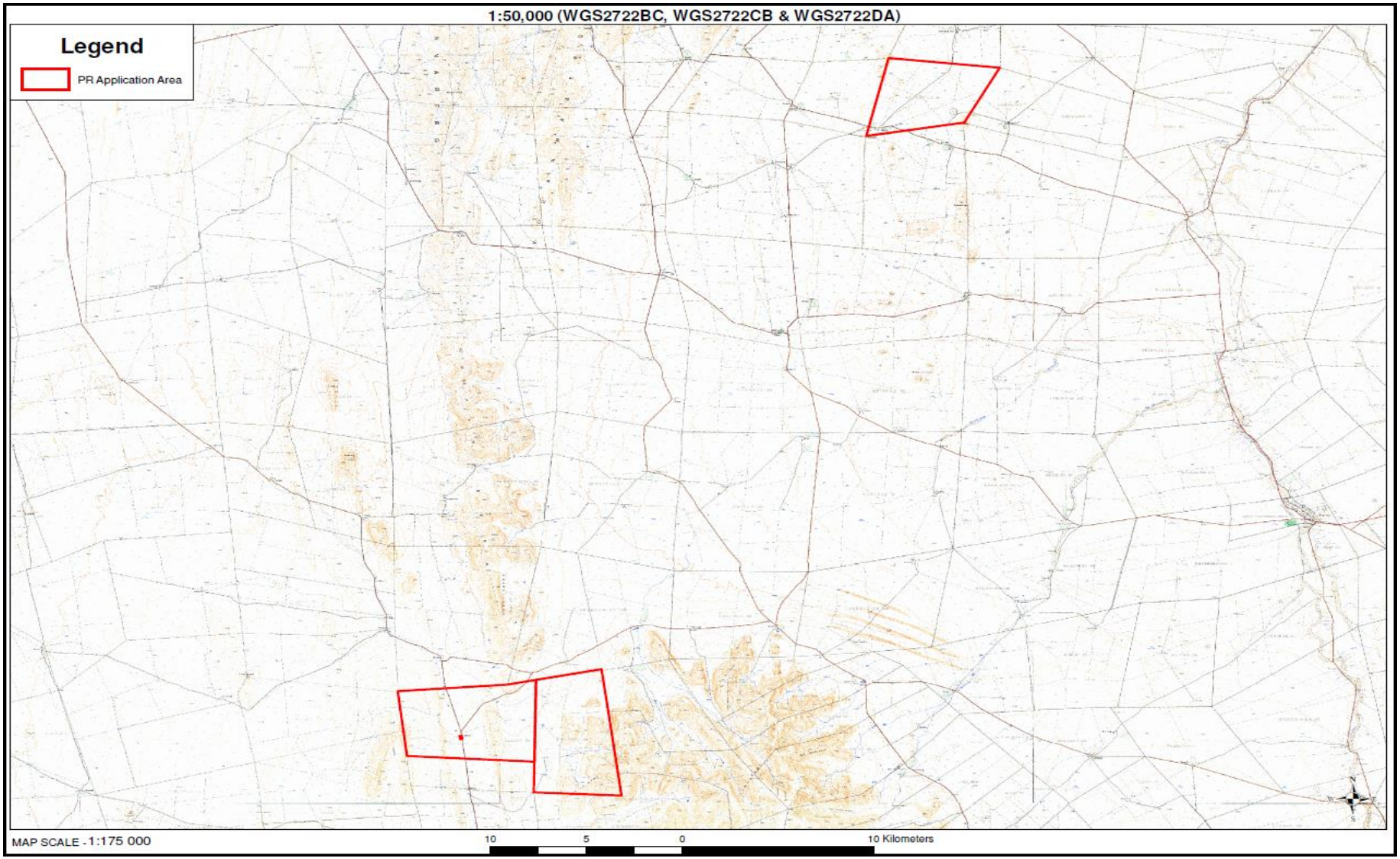


Figure 6. Topographical Map indicating the prospecting right application area in red.

(4) ***SOILS:***

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining 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.

According to Coetsee (1979) the geological features of the study area primarily comprise Quaternary deposits, intermixed with Mokolian deposits and a very small proportion of Vaalian deposits. Most of the study area comprises of red to flesh-coloured wind-blown sand, with various quartzite formations belonging to the Volop Group (Griqualand West Sequence) protruding throughout the properties. A very small area in the south-east of La Rochelle comprises Lucknow Quartzite with subordinate limestone and shale of the Olifantshoek Group (Griqualand West Sequence). The kieselguhr deposits on both the properties are primarily associated with alluvials that have not been normally mapped.

Land types found on the property include Ae5, Ae6, Ae13 and Ic2 (Figure 7). The plains (Ae types) are associated with red-yellow apedal, freely drained soils, red with a high base status and is more than 300mm deep, with no dunes present. The hills are associated with Ic types and are usually very rocky with little or no soil.

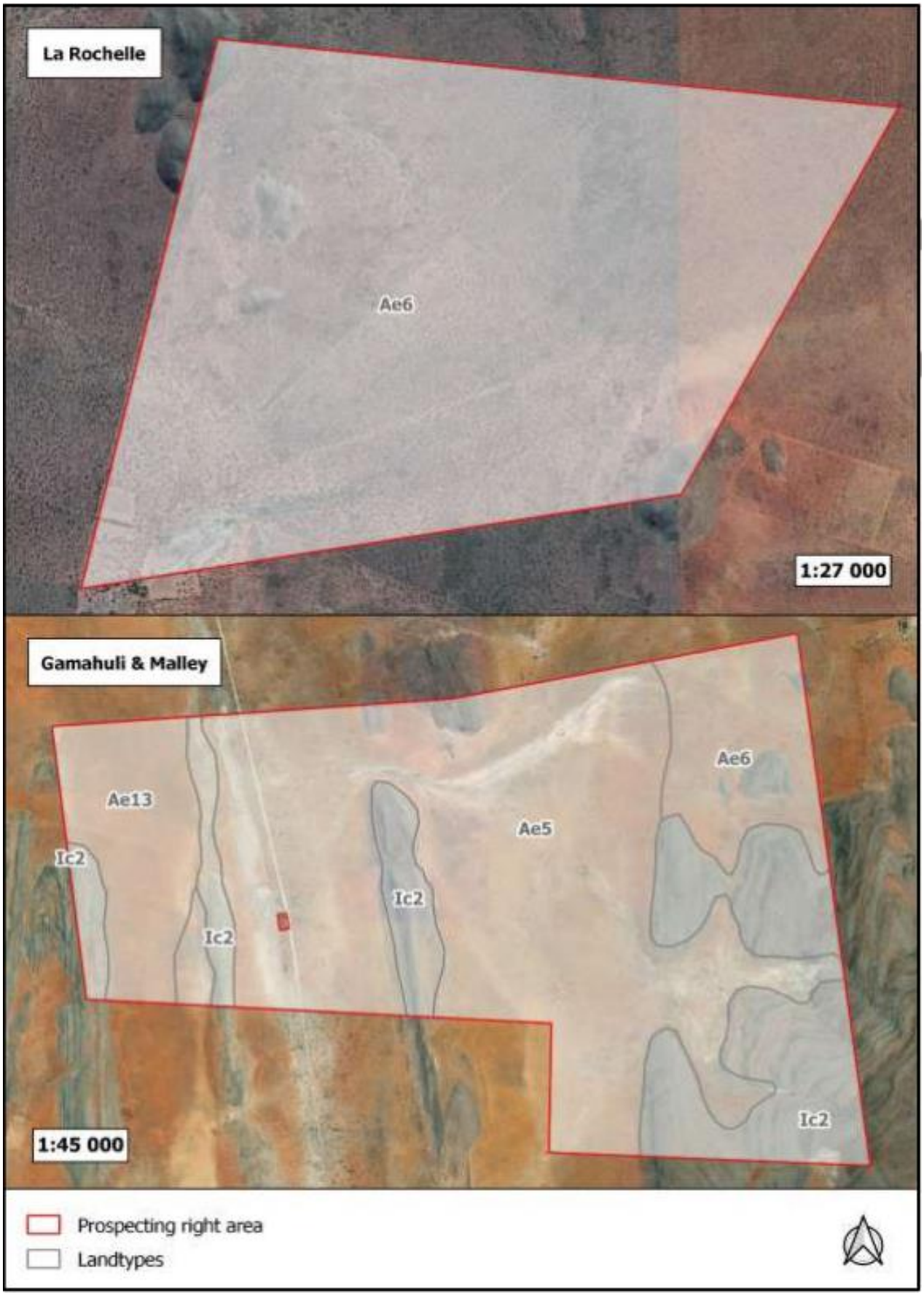


Figure 7. The distributions of land types in the study area

(5) *LAND CAPABILITY AND LAND USE:*

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining 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 included activities related to agriculture and hunting. The land capability for most of the study area is non-arable, with moderately low potential for grazing and wildlife, while the hills are classified as wilderness with very low land use potential. The agricultural region is demarcated for cattle farming, with the grazing capacity estimated at 13 Ha/LSU (on La Rochelle) and 15 Ha/LSU (on Gamahuli and Malley). The study area is not suitable for crop irrigation.

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.

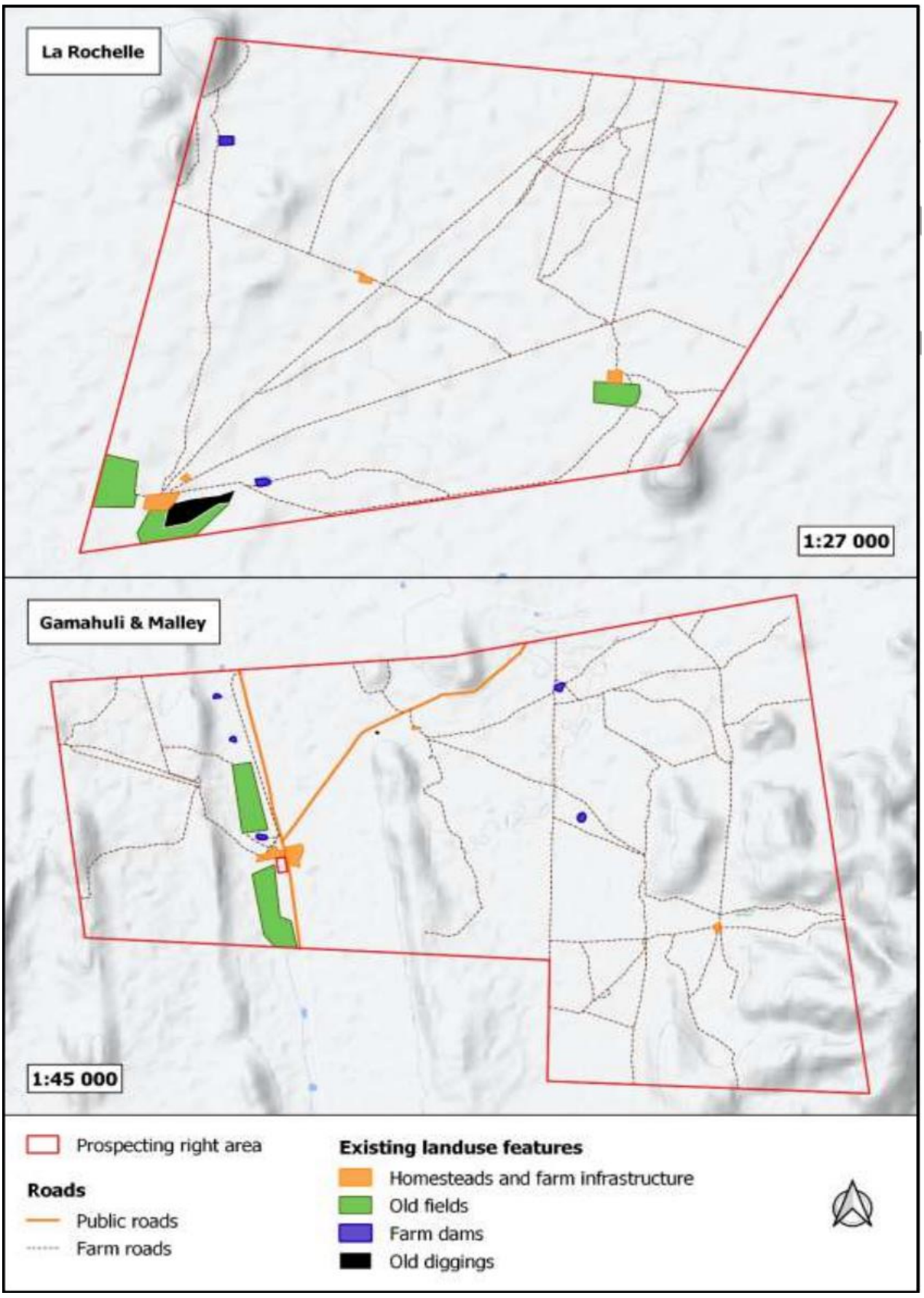


Figure 8. The existing land use features on the prospecting right area.

(6) *NATURAL FAUNA:*

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining 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 provides diverse habitat opportunities to faunal communities and the rocky and sandy substrates also 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. It is however possible that leopard could occasionally roam the larger hills on Gamahuli and Malley.

Furthermore, 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.

Brants' Whistling Rat, South African Ground Squirrel, Yellow Mongoose, Duiker, Steenbok, and Greater Kudu, all protected under Schedule 2, were recorded on site. The presence of fossorial mammals was also signified through many different burrows, observed during the field survey. Chacma Baboon (Schedule 4 – Problem animal) was also recorded during the field survey. Other problem animals with a high likelihood to occur here include Black-backed Jackal and Caracal.

Reptiles

The proposed prospecting area lies within the distribution range of at least 46 reptile species, of which none are red listed. However, most are protected either according to Schedule 1, 2 or 3 of NCNCA. 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 might be found in the hills. 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. Images of these reptile species of special importance are shown in.

Amphibians

Ten amphibian species are known from the region, of which none are red listed. However, all amphibians of the study area are protected according to Schedule 2 of NCNCA. 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 could therefore potentially occur on site, especially in the pans and artificial farm dams after good rainfall events. 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 Toad 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, of which 28 are listed either in the IUCN or South African Red Data Book of Birds. Of these, Ludwig's Bustard was recorded in the grassland community during the field survey. Furthermore, all birds are protected either according to Schedule 1, 2 or 3 of NCNCA.

Among these, birds with a high affinity for woodland and grassland habitat, i.e. Martial Eagle, Tawny Eagle, Bateleur, Lanner Falcon, Red-necked Falcon, Red-footed Falcon, White-backed Vulture, Secretarybird, Lappet-faced Vulture, Kori Bustard, Roller- and Owl species, have the highest likelihood to occur on site and are expected to forage, nest or pass through the woodland and grassland communities. The protected water birds (i.e., Chestnutbanded Plover, Storks, Black-winged Pratincole, Maccoa Duck, Lesser Flamingo and Greater Flamingo) may potentially occur in the artificial pan, but only seldomly when it is inundated. High altitude rock associated species (Verreaux's Eagle, African Rock Pipit and Cape Vulture) may occur on the hills. Sociable Weaver's nests were observed in many of the larger Vachellia erioloba trees.

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 or protected fish. However, no suitable habitat for fish occurs on site and therefore no fish species are expected to occur in the study area.

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. Among the listed invertebrates, 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 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.

Three major habitats delimit possible invertebrate communities in the study area:

i. **Terrestrial vegetation classified as bushveld for insect preference (Picker et al. 2004)**

   All the terrestrial vegetation communities on site fall within this bushveld habitat. Invertebrate communities associated with this habitat are expected to be widespread and diverse. Those protected species discussed above with a likelihood to occur in the study area, are expected to be associated with this habitat. Insect activity during the field survey was limited by the dormant state of the vegetation, but grasshoppers were common. Furthermore, termitaria, most likely belonging to *Trinervitermes trinervoides*, are abundant in the woodland and grassland communities.

ii. **Artificial pan**

   The artificial pan on site resembles an ephemeral wetland, which is known to host crustaceans that are specifically adapted to ephemerality. Their eggs lie dormant in the soil until the pans are inundated. They then hatch and mature rapidly to produce eggs that accumulate in the top few centimetres of the sediment. These eggs are heat and drought resistant and ensure the continued existence of species in a habitat. Not much is known about the species distribution or conservation status of species in the Northern Cape, but taxa that could potentially occur in the artificial pan on site include Notostraca (Tadpole shrimp), Anostraca (Fairy shrimp), Spinicaudata (Clam

shrimp), Cladocera (water fleas), Ostracoda (Seed shrimp) and Copepoda (Copepods). Within a few days after the pan is inundated several wetland bird species will arrive to forage on the crustaceans as their main food source. If the pan remains wet enough the water birds will stay longer to start nesting and breeding. Therefore, the crustaceans are essential components in the food web.

iii. Ephemeral drainage ways

Invertebrates expected to be associated with the ephemeral drainage ways when flooded include generalist species like biting midges, non-biting midges and house flies. Various dragonfly species are also expected to occur here. When desiccated however, those species associated with the terrestrial habitats are also expected to occur here.

(7) FLORA:

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining 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 three broad-scale vegetation units, i.e. Kathu Bushveld, Koranna-Langeberg Mountain Bushveld, and Olifantshoek Plains Thornveld (Figure 9).

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.

Koranna-Langeberg Mountain Bushveld occurs in the Northern Cape at altitudes between 1 000 and 1 836 m. It is found from the Tswalu Kalahari Reserve, at the northern tip of the Korannaberg, in the form of multiple ridges,

to the Langeberg west of Olifantshoek. The topography comprises mountains with steep slopes which supports open shrubland with moderately open grass cover. The geology comprises quartzite, greywacke and lenses of hematite of the Olifantshoek Supergroup. Soils consist of very rocky, shallow sand. The unit is considered least threatened, with none being statutorily conserved, but it is partly conserved in private reserves, such as Tswalu. Virtually none of this unit has been transformed and erosion is very low.

Olifantshoek Plains Thornveld is found in the Northern Cape at altitudes between 1 000 and 1 500 m. It is restricted to the pediments of the Korannaberg, Langeberg and Asbestos Mountains. The plains are presented by an open tree and shrub layer, with a sparse grass layer. The unit occurs on red aeolian sand of the Kalahari Groups with silcrete and calcrete and some andesitic and basaltic lava of the Griqualand West Supergroup. Soils are deep. Only 1 % of the unit has been transformed and erosion is very low. It is considered least threatened, and a small proportion is being conserved in the Witsand Nature Reserve. The shrub *Amphiglossa tecta* is the only endemic plant species known from this unit.

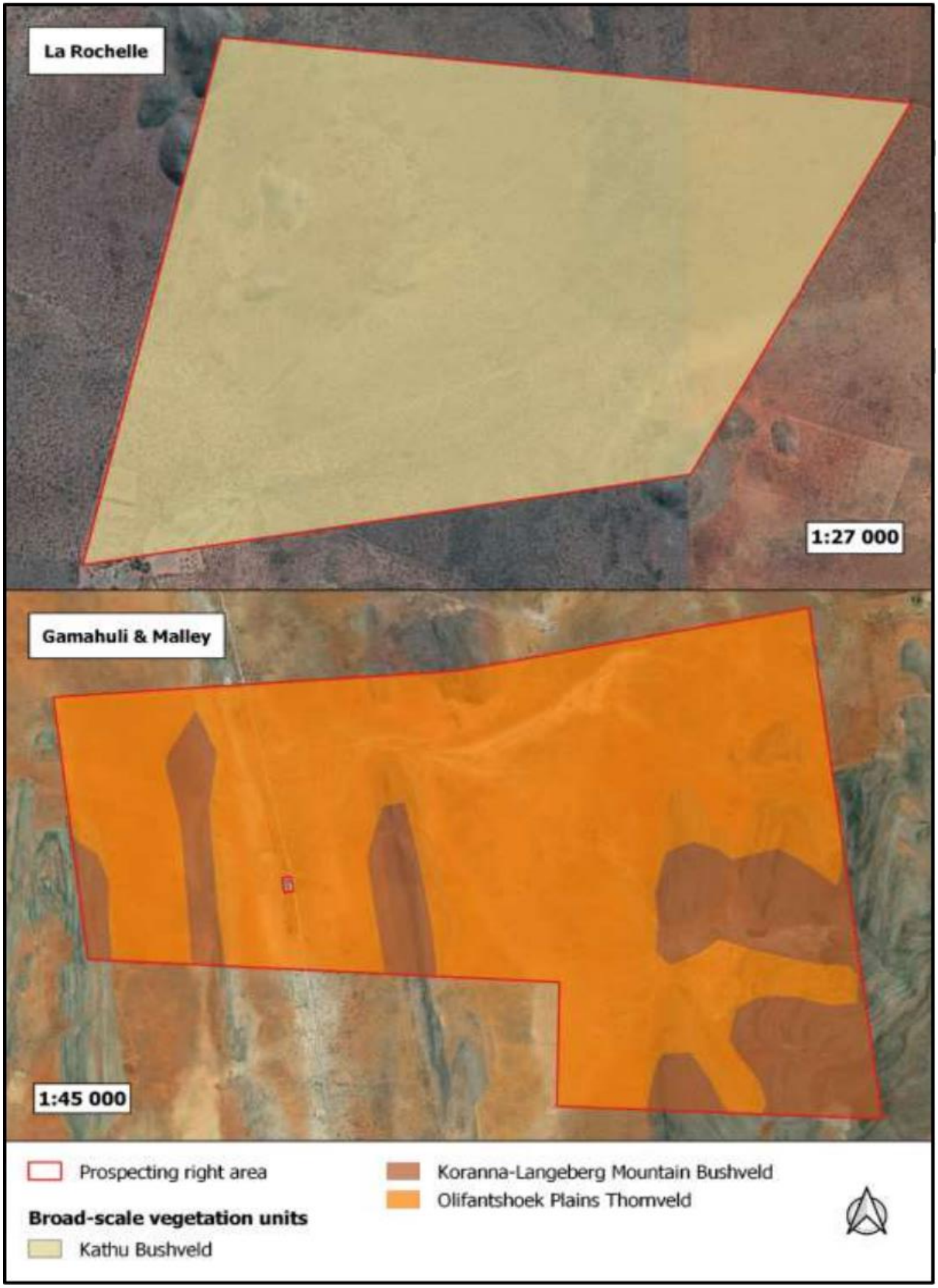


Figure 9. The broad-scale vegetation units (Mucina and Rutherford 2012) present in the study area. (Map taken out of the Ecological study by Dr. B Milne, 2021)

Fine-scale vegetation patterns

Plant communities in the study area are delineated according to plant species correspondences and changes in soil structure. They can be divided into five distinct units, which are described below. These descriptions include unique characteristics and the dominant species found in each unit. A complete plant species list, including those species likely to occur here is listed in the Ecological study appended to this document as Appendix 4.

i) **Vachellia erioloba - Stipagrostis uniplumis open woodland on red sand**

This community covers most of the study area and is found on aeolian deposits (Figure 10), where red sand constitutes about 10 % of the ground cover. The vegetation is presented as woodland where *Vachellia erioloba* dominates the tall tree layer, while the grassy matrix is dominated by *Stipagrostis uniplumis*. The woodland on La Rochelle comprises a much taller, denser tree canopy, while the woodland on Gamahuli and Malley includes a combination of tall shrubs and trees, with more open canopies.

Apart from the dominant species, other common trees scattered in this community include *Vachellia haematoxylon, Boscia albitrunca, Senegalia mellifera, Ziziphus mucronata* and *Tarchonanthus camphoratus*. Tall shrubs include *Grewia flava* and *Lycium hirsutum*, with *Viscum rotundifolium* parasitising many of these larger woody species. Lower shrubs such as *Rhigozum trichotomum, Lycium cinereum, Justicia incana, Eriocephalus ericoides, Chrysocoma ciliata, Pteronia mucronata, Lasiosiphon polycephalus, Asparagus exuvialis, Aptosimum albomarginatum, A. marlothii, A. elongatum, Pollichia campestris, Elephantorrhiza elephantina* and *Geigeria brevifolia* occurred in the grassy matrix.

The grass layer is well developed and apart from the dominant species, *Eragrostis rigidior, Aristida congesta* subsp. *congesta* and *Eragrostis lehmanniana* are also very common. Other species include *Schmidtia pappophoroides, Pogonarthria squarrosa, Aristida engleri var. ramosissima* and *A. meridionalis*.

Common herbs include *Senna italica, Indigofera daleoides, Hermannia abrotanoides* and *Dicoma capensis.*

ii) **Croton gratissimus - Digitaria eriantha open shrubland on quartz hills**

This community has a patchy distribution across the study area and is restricted to the hills (Figure 10). Here, shallow soil and Quartzitic rock constitutes about 30 % of the ground cover. It is presented as an open shrubland with the dominant shrub *Croton gratissimus* scattered in a grassy matrix, dominated by *Digitaria eriantha*.

The shrub layer is further occupied by other common trees and shrubs, including *Senegalia mellifera, Searsia burchellii, Boscia albitrunca, Vachellia erioloba, Diospyros lycioides, Tarchonanthus camphoratus* and *Leonotis pentadentata.*

Apart from *D. eriantha, Cenchrus ciliaris, Aristida congesta* subsp. *congesta* and *Eragrostis rigidior* is also very common. Other grasses found here include *Aristida meridionalis, Heteropogon contortus* and *Urochloa nigropedata*.

iii) Aristida congesta - Eriocephalus ericoides shrubby grassland on alluvium

This community is associated with alluvium deposits, which occur in the centre of Gamahuli and Malley (Figure 10). It is found on light-coloured calcareous and sandy soil, where bare ground constitutes about 10 % of the ground cover. It is presented as a grassland dominated by *Aristida congesta* subsp. *barbicollis*, intermixed with a low shrub layer dominated by *Eriocephalus ericoides*.

The grass layer is not particularly well developed but forms very dense stands. Apart from the dominant grass species already mentioned, other abundant grasses include *Chloris virgata, Eragrostis rotifer* and *E. rigidior. Pogonarthria squarrosa* and *Aristida congesta* subsp. *congesta* also occurred here, but at low densities.

The low shrub layer is diverse and in addition to the dominant species, other species include *Oedera humilis, Plinthus karooicus, Justicia incana, Ruschia griquensis, Tetraena microcarpa, Melolobium candicans, Pentzia calcarea, Pteronia mucronata, Barleria rigida, Thesium hystrix* and *Salsola sp. Taller* shrubs and trees, i.e., *Vachellia erioloba, V. hebeclada, Grewia flava, Lycium cinereum* and *Rhigozum trichotomum* also occur scattered across the grassland matrix, but at low densities.

Herbs include *Convolvulus sagittatus, Senna italica, Kewa salsoloides* and *Chascanum pinnatifidum*.

iv) Eragrostis rotifer - Chloris virgata grassland on artificial pan

This community is located on what appears to be an artificial pan, where an earth wall intercepts the natural drainage line in the north of Gamahuli (Figure 10). Here, it is surrounded by the shrubland community on alluvium.

The centre of the pan is primarily bare, from where it transitions outwards into a monotonous grassland dominated by *Eragrostis rotifer*, but *Chloris virgata* is also present. Trees line the periphery of the pan, which includes

Vachellia erioloba, V. hebeclada, Ziziphus mucronata, Grewia flava, Lycium hirsutum and *L. cinereum*. The grass *Setaria verticillata* occurs under the tree canopy and the low shrub *Oedera humilis* occurs near the transition zone with the shrubland on alluvium.

v) **Prosopis glandulosa - Vachellia erioloba closed woodland on transformed land**

This community is restricted to a small area in the south-west of La Rochelle (Figure 10), where historic land use activities have transformed the natural vegetation. The vegetation resembles the woodland on red sand, but it has been severely infested by Prosopis glandulosa to form impenetrable stands of trees in some places. Red sand constitutes 10 - 20 % of the ground cover.

Apart from the dominant *Prosopis* stands, *Vachellia erioloba* trees are also common. Tall shrubs include *Senegalia mellifera, Ziziphus mucronata* and *Vachellia hebeclada*. Lower shrubs include *Rhigozum trichotomum, Lycium cinereum, Lasiosiphon polycephalus, Chrysocoma ciliata, Aptosimum marlothii, Pentzia incana* and *Asparagus exuvialis*.

The grass layer is dominated by *Aristida congesta* subsp. *congesta*, but *Stipagrostis uniplumis* is also abundant. Other grasses include *Pogonarthria squarrosa, Schmidtia pappophoroides, Eragrostis rigidior, E. trichophora, Chloris virgata, Aristida meridionalis, A. adscensionis* and *Cenchrus ciliaris*.

Senna italica was the only herb recorded here during the survey.

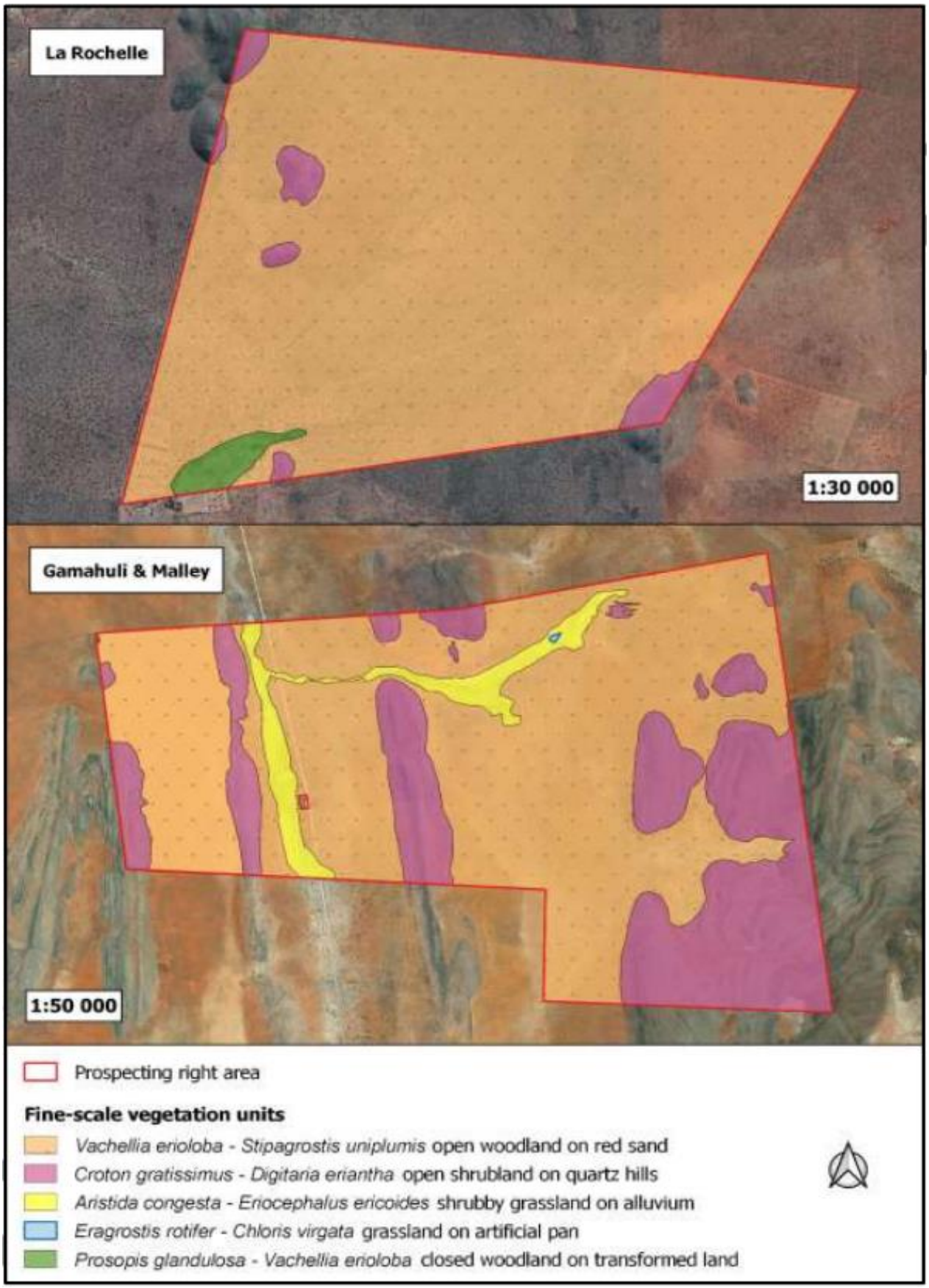


Figure 10. The expected distribution of proposed fine-scale plant communities in the study area. (Map taken out of the Ecological study by Dr. B Milne, 2021)

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 states that 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.

Most species recorded in the area are classified as least concern; a category which includes widespread and abundant taxa. However, one species, i.e., *Tragia physocarpa*, is listed as "Data Deficient – Taxonomically Problematic". This species was originally described from material collected in 1912 in northern Namibia, but since then only a few scattered records from Gauteng and the Kalahari Region of the Northern Cape have been matched to the description. The genus *Tragia* needs revision, and many species are poorly known. Due to the uncertainty around the identity of this taxon, its risk of extinction has not yet been assessed. It was not recorded during the survey, but it is known to prefer rocky places in grassland, bushveld and thornveld. Therefore, it is most likely to be restricted to the hills on site.

Species protected in terms of the National Forests (NFA) Act No 84 of 1998 include *Vachellia erioloba, V. haematoxylon* and *Boscia albitrunca*. The latter species is also protected according to the NCNCA (Schedule 2) and occurs widespread across the hills and woodland on red sand. In the latter community they are found at low densities of less than 1 individual per hectare, as large adult trees with canopies of 5 - 12 m in diameter and up to 5 m tall. On the hills the occur at slightly higher densities (3 - 4 individuals per hectare), as adult trees with canopies of ± 3 - 5 m in diameter and up to 3 m tall.

Vachellia erioloba occurs across the entire study area, with its densities being very high in the woodland on red sand (8 - 20 individuals per hectare) as well as the infested woodland (10 individuals per hectare).

Vachellia erioloba also formed dense stands around the artificial pan, but in the grassland and hills their densities were very low (< 1 individual per ha). Here, they also primarily occurred as adult trees (2 – 5 m (w) x 3 – 6 m (h)), but in the woodlands they are found across the entire size and age range, i.e., from

saplings (20 - 60 cm (w) x 20 - 80 cm (h)), young individuals (1 m (w) x 1.5 - 2 m (h)) to tall adult trees (3 - 10 m (w) x 6 - 12 m (h)).

Vachellia haematoxylon are restricted to the woodlands on red sand of Gamahuli and Malley, where they are found at moderate densities of 2 - 4 individuals per hectare as young shrubs (1 – 2 m (w) x 2 m (h)) to adult trees of up to 5 m tall, with canopies of 2 - 6 m wide.

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. Species already discussed above, i.e., *B. albitrunca* is protected according to Schedule 2. *Ruschia griquensis*, also protected according to Schedule 2 of the NCNCA occurs in the grassland on alluvium, at very low densities. The remaining species were not encountered during the field survey.

Table 4. Plant species found in the region that are of conservation concern.

FAMILY	Scientific name	Status	NFA	NCNCA
AIZOACEAE	*Ruschia griquensis*	LC		S2
AMARYLLIDACEAE	*Haemanthus humilis* subsp. *humilis*	LC		S2
	Nerine laticoma	LC		S2
APOCYNACEAE	*Fockea angustifolia*	LC		S2
	Gomphocarpus fruticosus	LC		S2
	Gomphocarpus tomentosus subsp. *tomentosus*	LC		S2
	Orthanthera jasminiflora	LC		S2
BRASSICACEAE	*Boscia albitrunca*	LC	X	S2
EUPHORBIACEAE	*Euphorbia spartaria*	LC		S2
	Tragia physocarpa	DDT		
FABACEAE	*Lessertia frutescens* subsp. *frutescens*	LC		S1
	Vachellia erioloba	LC	X	
	Vachellia haematoxylon	LC	X	
IRIDACEAE	*Moraea polystachya*	LC		S2
OXALIDACEAE	*Oxalis haedulipes*	LC		S2
SCROPHULARIACEAE	*Jamesbrittenia integerrima*	LC		S2

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). All declared weeds and invasive species recorded in and around the study area are listed in Table 6, along with their categories according to CARA, NEMBA and NCNCA.

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
Grewia flava	Velvet Raisin
Rhigozum trichotomum	Three-thorn rhigozum
Senegalia mellifera	Black thorn
Tarchonanthus camphoratus	Camphor Bush

(8) ***SURFACE WATER***

Dr Elizabeth (Betsie) Milne has been appointed by Wadala Mining 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 surface water was described and included in this report as part of the ecological study. (Appendix 4).

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 catchments D41K and D42C of the Lower Vaal Water Management Area (Figure 11). Both quaternary catchments have 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 these quaternary catchments are provided in Table 8.

Table 8. Chatchment 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
D42C	18 110	216	2 700	7.78

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.

The study area does not comprise any natural wetlands, but several drainage channels flow through it (Figure 9).

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

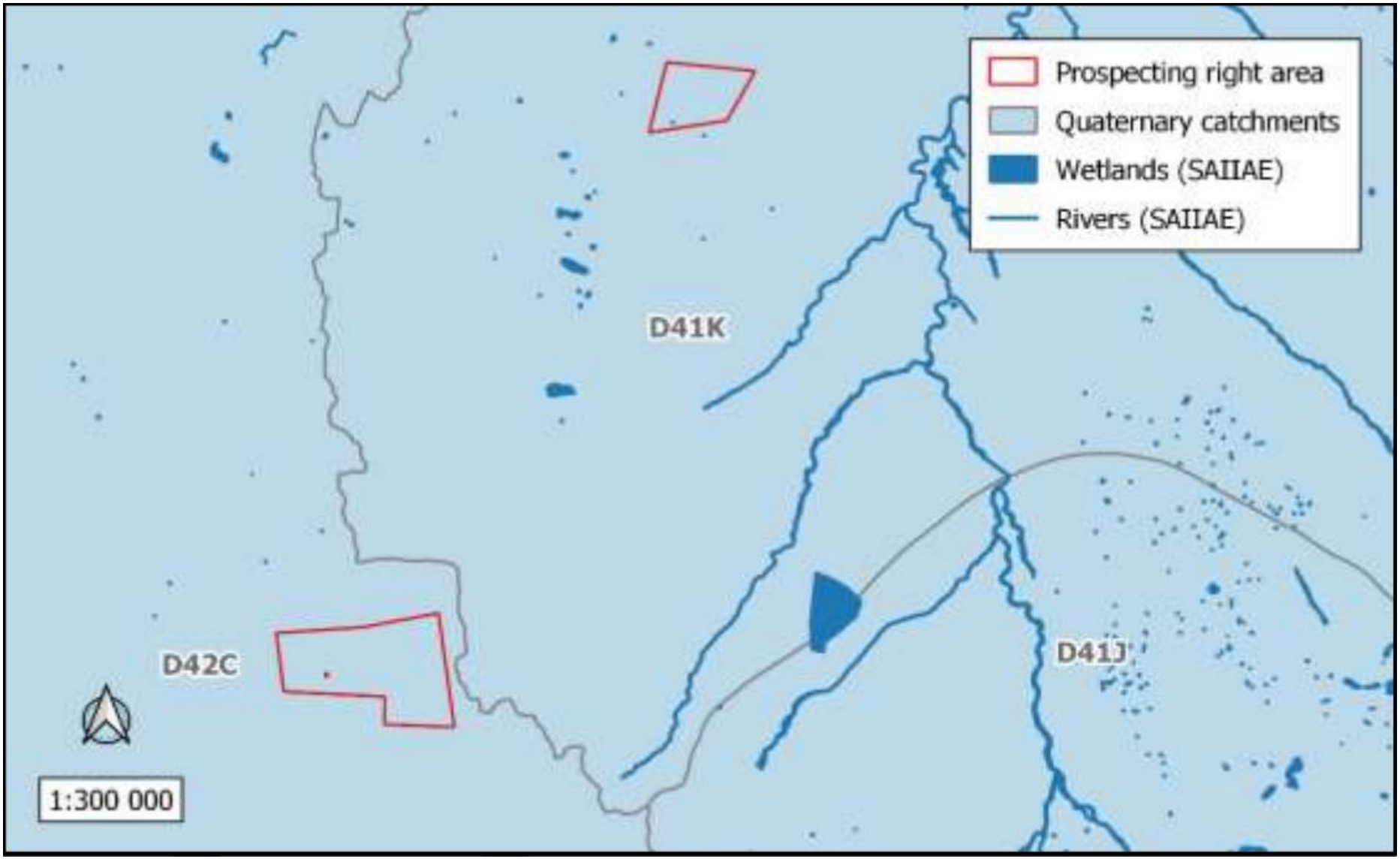


Figure 11. The locality of the proposed prospecting area in relation to the quaternary catchments of the Lower Vaal Water Management Area.

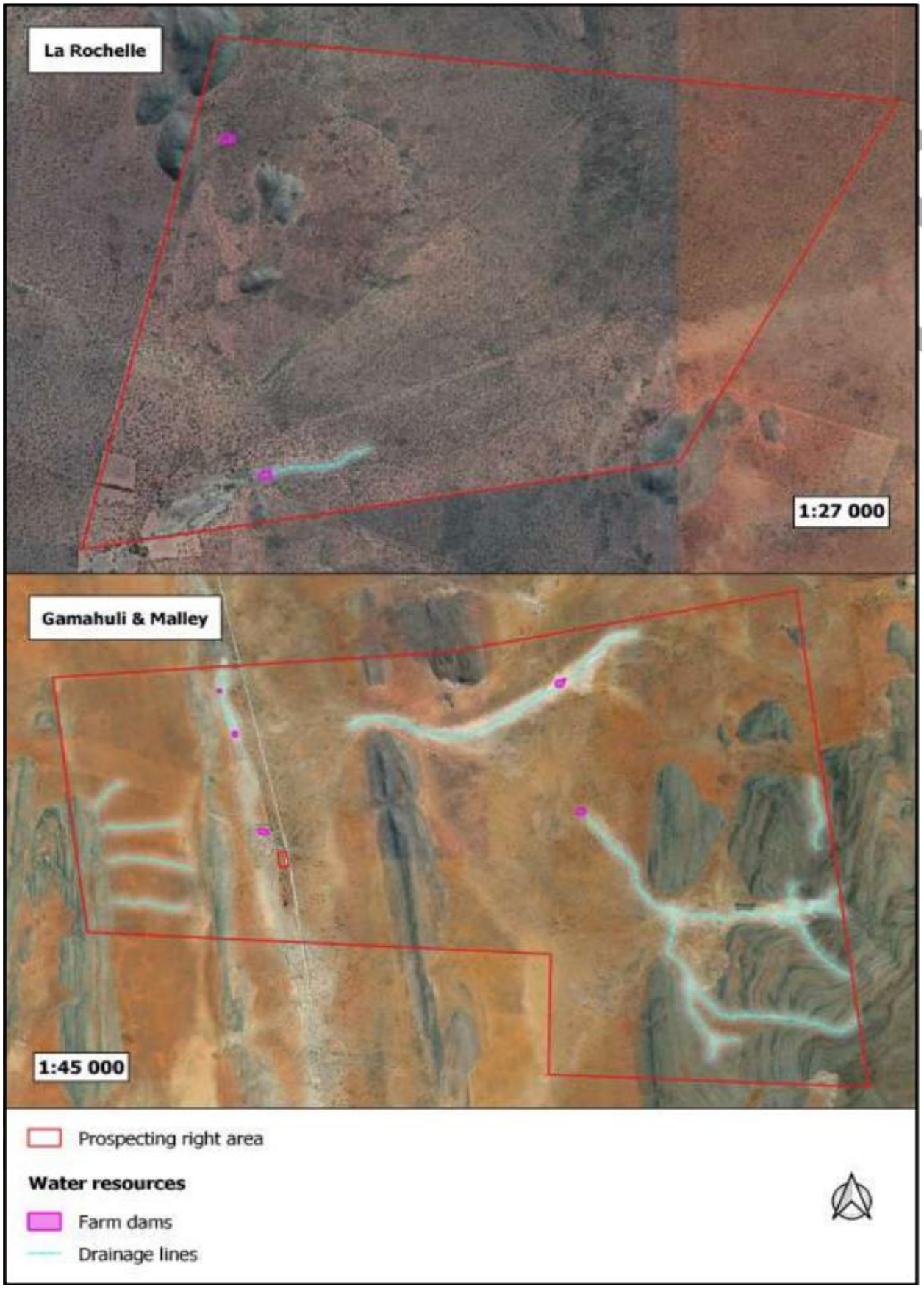


Figure 12. The location of water resources on the proposed prospecting right area. (Taken from the Ecological study of Dr. Milne, 2021)

(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
As the prevailing wind direction for the area is north to north north west for the months January to September and changing from north to sometimes westerly winds during October to December, 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 Wadala Mining and Consulting to compile a Heritage Impact Assessment in order to determine whether there are any areas of heritage and cultural importance (Appendix 5). This HIA Report

was compiled by making use of a desktop study as well as a field survey on all three of the farms

The farms Malley and Gamahuli lie on a sandveld on the wetter margins of the Kalahali Desert. On both farms an extensive flat terrain is broken by north-south quartzite ridges that are prominent in the landscape. The flat areas support a grassland and thick ground cover impairing visibility due to good rains in the past rainy season. Trees and shrubs are scattered on the plain while acacia scrub dominated by hooked thorn bushes, haakbos (*Senegalia mellifera*) grows on the hill sides and forms a shield along the foot of the ridges.

On the farm La Rochelle terrain features are basically similar to those observed on the other farms except for the absence trending hills. Instead, there are two prominent dome-shaped hills on the boundaries of the property. Another vegetation element is scattered mature camel thorn trees (*Acacia erioloba*) which provide visual breaks in the flat landscape.

Findings

Dr. Matenga stated that a thick cover of grass impaired ground visibility and that due to the characteristics of windblown Kalahari sands that tend to cover surface scatters of artifacts. It is possible that surface discard of artefacts and manufacturing waste were covered by the windblown sand.

Stone Age

On the farm Malley, scatters of Stone Age lithics were found along the base of a quartzite ridge. Among the finds were hand-axes, a cleaver, scrapers and flake tools. The assemblage represents all three epochs of the Stone Age from the Early Stone Age through the Middle Stone Age to the Later Stone Age. There were no significant concentrations of artefacts to warrant further mitigation action.

Commercial farming heritage

A number buildings and structures were noted on all three farms. Of particular significance is a farmhouse, the principal dwelling structure on La Rochelle, built in 1921 which is an exemplar of the architectural quality of houses in commercial areas at the time. The house will not be affected by the proposed operations; neither are there other compelling circumstances for alteration or destruction of the building.

Burial grounds

There is a burial ground on the farm La Rochelle. The graves are fenced off. As a standard precaution a 100 m buffer will be reserved as illustrated in the figure 13 below. If an extension of the stated activities into the servitude becomes

necessary, an application for a permit must be lodged with the heritage authority.

Figure 13. Burial ground on La Rochelle and prescribed servitude.

Wadala Mining and Consulting has appointed Dr. Marion Bamford to conduct a desktop study and compile a Palaeontological Impact Assessment for the prospecting right application on the farms Malley, Gamahui and La Rochelle. The study can be found in Appendix 6.

Palaeontological context

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).

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.

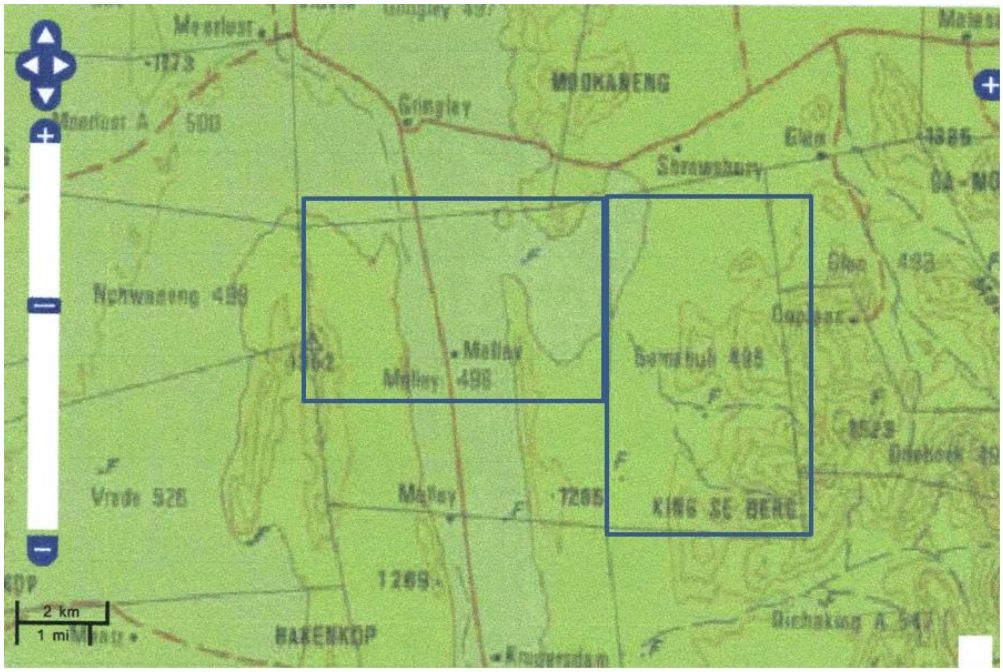


Figure 14. SAHRIS palaeosensitivity map for the site for the proposed Prospecting Rights on Farms Malley and Gamahuli, shown within the blue rectangles. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero

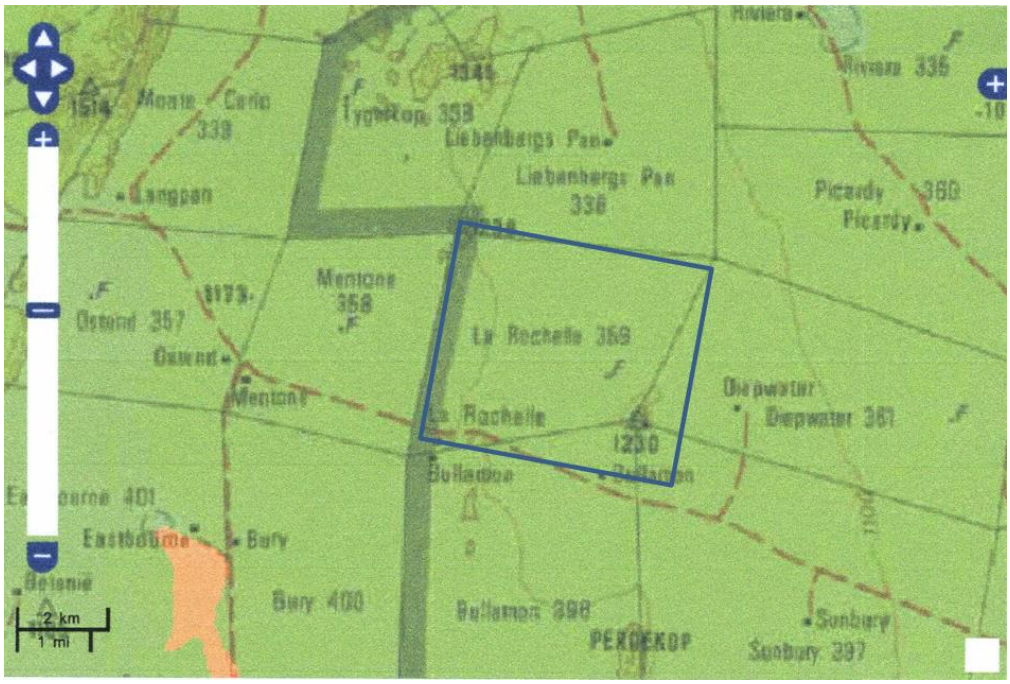


Figure 15. SAHRIS palaeosensitivity map for the site for the proposed Prospecting Rights on Farm La Rochelle, shown within the blue rectangle. Background colours as for Fig 14.

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. 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 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.

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.

(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 as a whole. Although most of the site comprises Other Natural Areas, the hills are classified as Ecological Support Areas (Figure 16). No Critical Biodiversity Area One-, Two, or Protected Areas occur within the study area, but the Tswalu Kalahari Reserve, which lies north and west of the study area, is classified as a Protected Area, with its surrounding buffer as Critical Biodiversity Area Two.

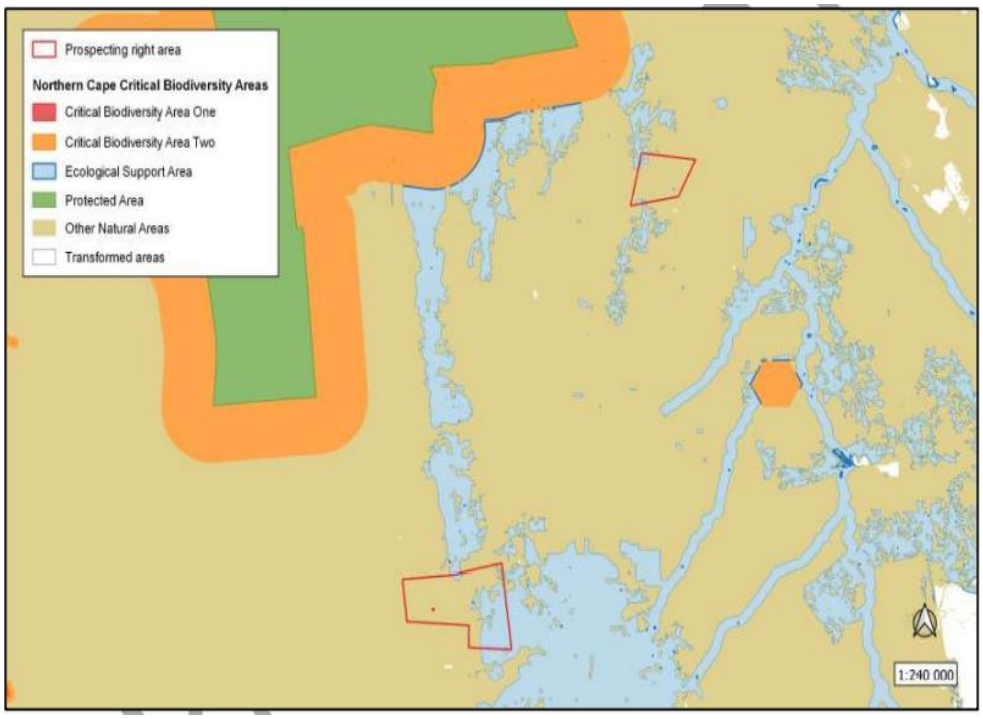


Figure 16. The study area in relation to the Northern Cape Critical Biodiversity Areas.

The Mining and Biodiversity Guidelines (DENC et al. 2013) does not classify any section on Gamahuli and Malley to have biodiversity importance, and therefore does not constitute a high risk for mining, but it does classify the north-eastern half of La Rochelle to have Moderate Biodiversity Importance, which constitutes a moderate 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.

None of the habitats in the study area have been identified as threatened ecosystems and no habitats on La Rochelle have been identified as ecological corridors within the John Taolo Gaetsewe District Municipality. However, the hills on Gamahuli and Malley have been classified to have High Conservation Priority, while the plains on these farms have Medium Conservation Priority within the Z F Mgcawu District Municipality.

The National Web based Environmental Screening Tool considers some parts of the study area to be sensitive (Figure 17). 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 entire study area is of low sensitivity based on the *Plant Species-* and *Aquatic Biodiversity Themes*. In terms of the *Animal Species Theme*, La Rochelle is of low sensitivity, while the central parts of Gamahuli and Malley is of medium sensitivity. This sensitivity is based on the associated habitat for the rare butterfly *Anthene lindae*. This butterfly is only known from a few localities in the region. In terms of the *Terrestrial Biodiversity Theme*, the hills of the entire study area are of High Sensitivity. This sensitivity is ascribed to their classification as Ecological Support Areas 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). 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.

Site sensitivity

The sensitivity map for the prospecting operation is illustrated in Figure 20. The ephemeral drainage ways are of very high sensitivity due to their vital ecological and hydrological functionality and significance. These natural channels, in which water flows intermittently, are also protected in terms of the National Water Act (Act No 36 of 1998). These units are essentially no-go areas.

The remainder of the study area is of high sensitivity, primarily because of the high occurrences of plant species of conservation concern that occur widespread across the entire site as well as the important habitat associations for animal species of conservation concern. The sandy substrates of the plains are also particularly prone to wind erosion after disturbances. Although these units are not regarded as no-go areas, activities should only proceed with caution as it may not be possible to mitigate all impacts appropriately.

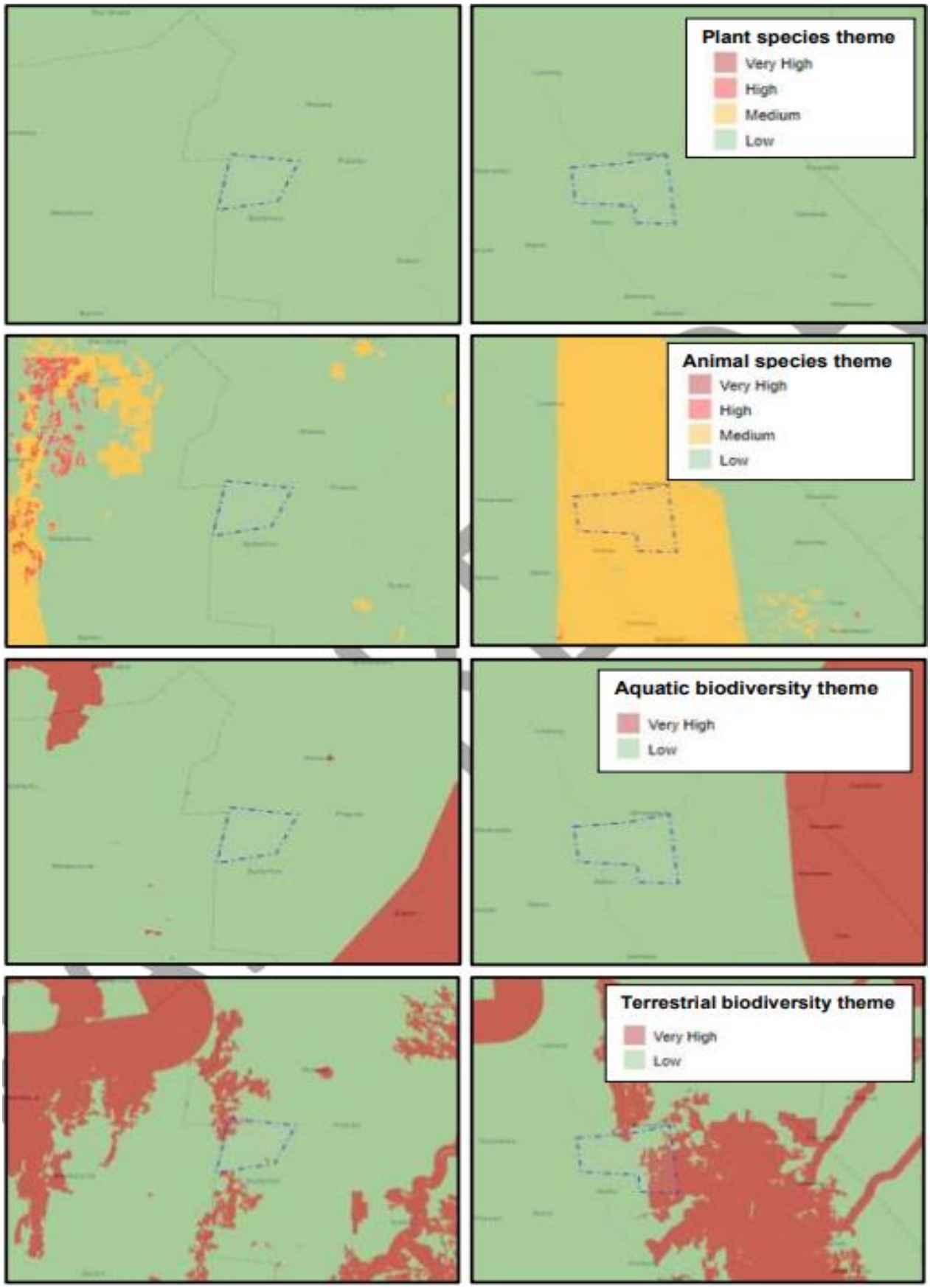


Figure 17. Environmental sensitivities associated with the study area, according to the National Web based Environmental Screening Tool (La Rochelle on the left and Gamahuli and Malley on the right).

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

The following information is gathered from the Tsantsabane approved 2020/2021 IDP for the farms Gamahuli and Malley as well as the Ga-Segonyana 2020/2021 draft IDP for the La Rochelle farm.

Population density, growth and location

Tsantsabane Local Municipality is situated in the ZF Mgcawu District Municipality and covers geographic area of 5 887km^2. The municipal area falls in the Gamagara Corridor. The NCPSDF (2012: 68) defines the Gamagara Corridor as "comprises the mining belt of the John Taolo Gaetsewe and Siyanda (ZF Mgcawu) districts and runs from Lime Acres and Danielskuil to Hotazel in the north. The corridor focuses on the mining of iron and manganese".

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.

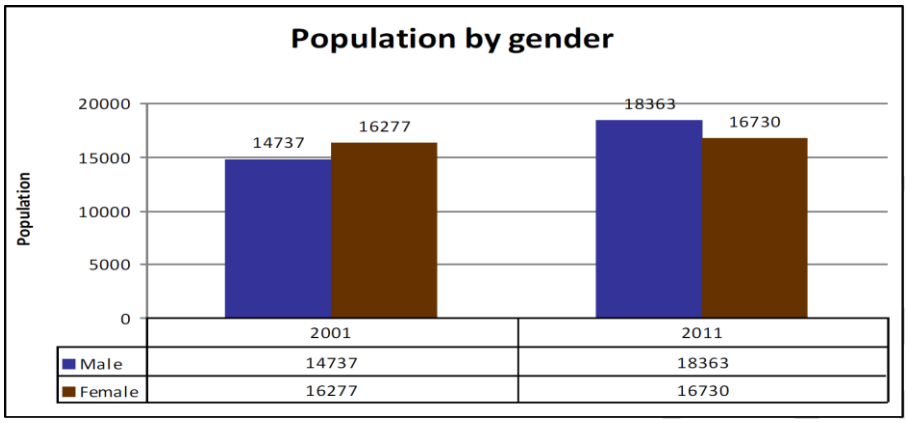
Kuruman is the main town of the area and is known as the "Oasis of the Kalahari". The town has a permanent source of water. Kuruman is situated 1 340 metres above sea level on the Ghaap Plateau. Kuruman is situated on the Namaquari route, forming part of the main route between Gauteng and Namibia and 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

According to the Census 2011 the population figures for Tsantsabane Local Municipality is 35 093, this indicates a population growth of 4079 from population size of 31 014 (Census 2001). However incremental community survey dating indicates that the municipality has 9839 households. The attributing factor to this population growth is the increase of people who come to the municipal area in search for better living conditions or jobs in the mining and solar industrial sectors.

Graph 1 indicates the population growth of the Tsantsabane Municipality by gender. The graph indicates that the total amount of males living in the municipality has increased by 24.6% from 14 737 in 2001 to 18 363 in 2011. An increase in the population of the women in the municipality has also increased

from 16277 in 2001 to 16730 in 2011. The municipality has more males than females and the reason could be derived from the male dominated employment industry as there are a lot of mines in the area.



Graph 1: Population by gender for the Tsantsabane Municipality.

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 (Ga-Segonyana).

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

Tsantsabane has a total population of 35 093 and table 11 is a summary of the population by gender and ethnic groups. Out of the whole population 54% are black male followed by 36% coloured males then 8% white and lastly 1% Indians. For females there are 51% black Africans followed by 40% coloured females then lastly 9% of whites in the municipal area.

Table 11: Population by gender and ethnic groups for Tsantsabane.

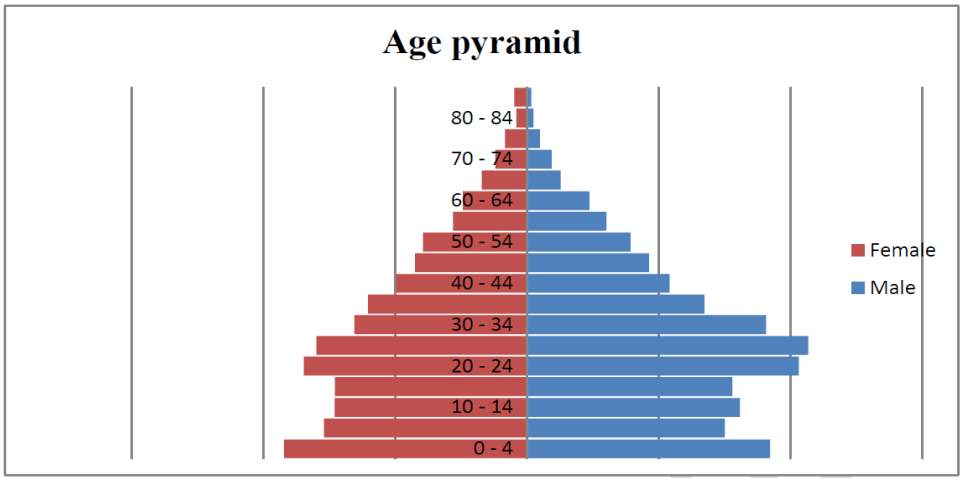
	Male	% Male	Female	%Females	Total
Black African	9939	54	8589	46	18528
Colored	6564	50	6620	50	13184
Indian or Asian	185	82	39	18	224
White	1506	51	1427	49	2933
Other	169	76	54	24	224
Total	18363	52	16730	48	35093

The population of Ga-Segonyana can also be described in terms of population groups as seen in table 12 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 12: Population by ethnic type, 1996-2016 (Ga-Segonyana)

	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**

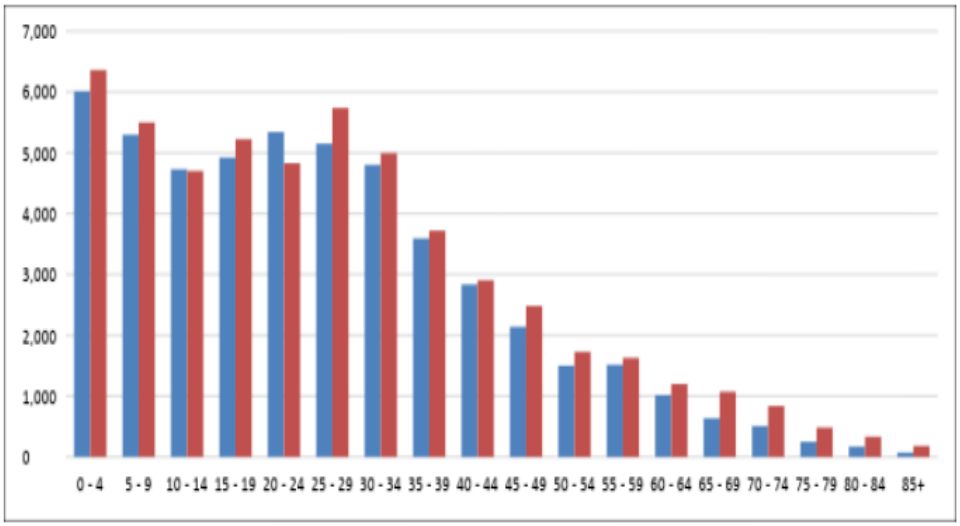
The age pyramid (Graph 2) indicates that the population of Tsantsabane is predominantly young people. There is a small percentage of people older than 60 years. The age pyramid further indicates that approximately 31% of the population is under 14 years and approximately 33% is between 15 and 34 years.



Graph 2: Age pyramid for the Tsantsabane Muncipality.

The population of Ga-Segonyana 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 3). 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 3: 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 13).

Table 13: 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

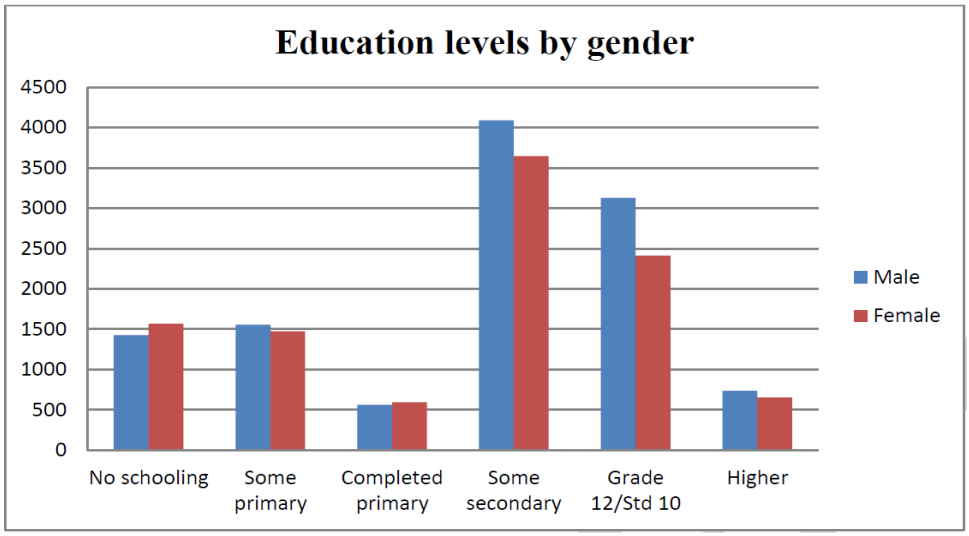
Education prepares individuals so that they are able to play an active role in the labour market, which directly affects their quality of life as well as the economy of a country and the area they live in. Through the education level, one can understand the skills that an area has and its potential to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

For the Tsantsabane Municipality the statistics indicate that although a high number of students enrolling for primary school a very low number of students complete grade 12. This has resulted in a very low probability for employment. Only 5% of those who enrolled for grade 1 make it into tertiary. Less than 15% of the population has a tertiary qualification or have completed Grade 12. It must, however, be mentioned that the education level is affected negatively by the urbanization process, in the past since it mostly involves matriculates and those with a better qualification, due to the local lack of job opportunities. This can also be attributed to the fact that the nearest University of Technology (Central University of Technology, in Bloemfontein) is almost 400km away and the Sol Plaatjie University has recently started a limited offering of some courses. Males seems to be doing much better when it comes to education levels, as

more men have some secondary education, grade 12 and higher education than their female counterparts (Graph 4).

Table 14 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.



Graph 4: Education levels by gender for the TSantsabane Municipality.

The White population is far more educated than the other population groups in the Ga-Segonyana municipality, where about 27.4% of Whites have a tertiary education, followed by 6.4% for Coloureds, and 4.9% for Black Africans.

Table 14: Highest level of education for persons aged 20 years and above, 1996-2016 (Ga-Segonyana).

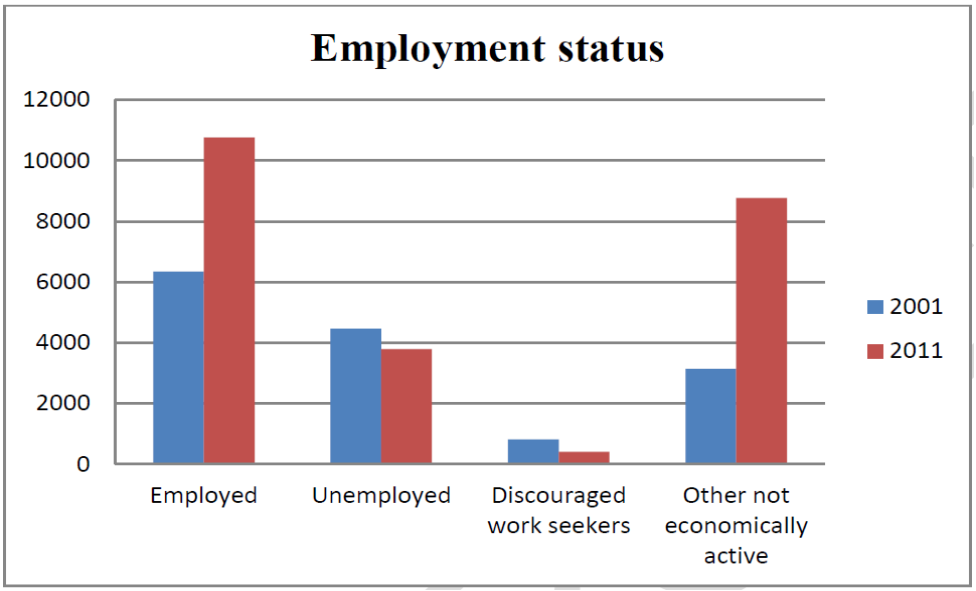
	1996	2001	2011	2016
Number				
No schooling	7 108	7 210	5 124	4 221
Some primary	7 349	8 312	9 124	7 672
Complete primary	2 224	2 287	2 590	2 554
Some secondary	8 772	10 154	18 015	23 015
Grade 12/Std 10	3 706	6 633	12 474	17 715
Higher	1 607	2 218	5 241	3 432
Total	30 766	36 814	52 568	58 609
Percent (%)				
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

According to the STATSA unemployment figure for the Tsantsabane Municipality has drastically reduced from 4 466 in 2001 to 3 795 in 2011 this shows a decrease of 15%. Employment has increased by 69% in 2011, this clearly indicates that there are more people working in 2011 than in 2001.

There is more employed people in 2011 than in 2001 in the Tsantsabane Municipality, however there is a very high level of economically inactive members in 2011 than it was in 2001. The high number of economically inactive could indicate a high level of dependency on those who are employed.

Graph 5: Employment status indicated by gender for Tsantsabane.



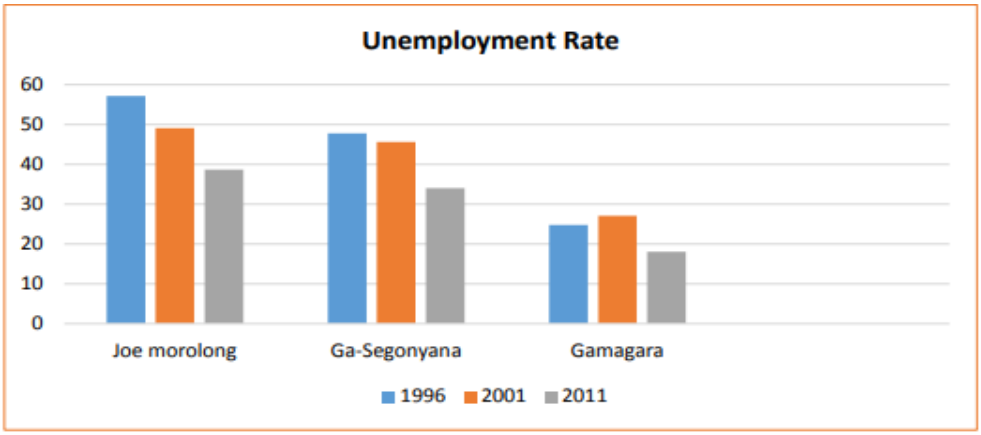
Graph 6: Employment Status for the Tsantsabane Municipality.

In 2011, the Ga-Segonyana 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 15: 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 7: The rate of unemployment in JTGDM [Source: StatsSA 2011]

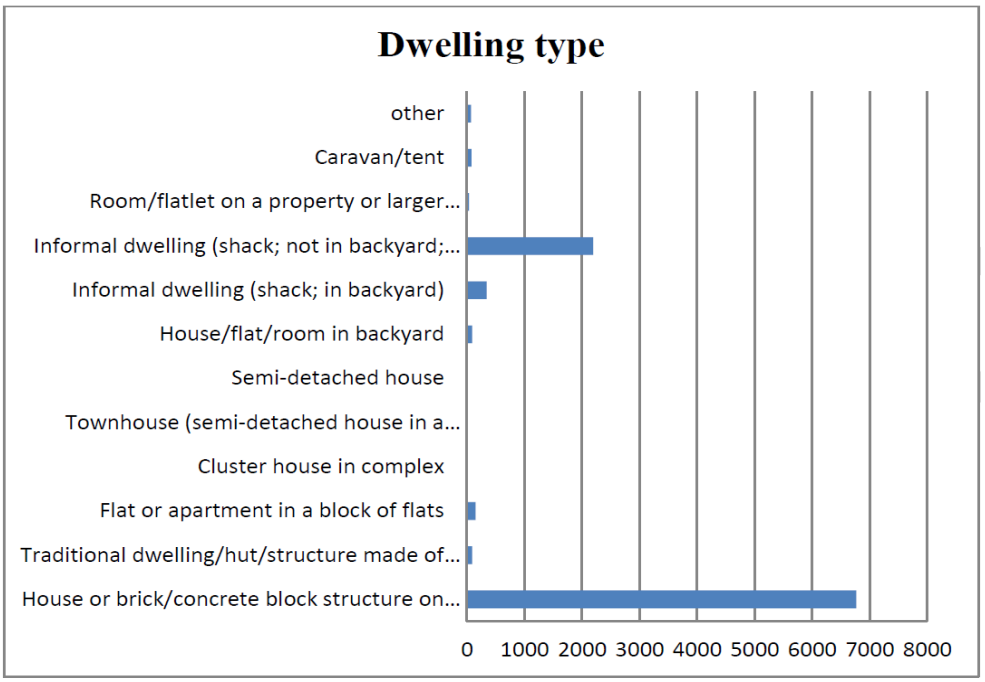
Housing

"Mining in Tsantsabane is the highest contributor to both its economic growth and job creation; the town has three new mines in the last 2 years. Tsantsabane is located 200km outside of Kimberley. Tsantsabane has three main traffic routes that provide access to other cities, namely Johannesburg via Kuruman and the Kalahari and Cape Town via Kimberly. More than 99,86% of the municipality is currently vacant/undeveloped. Tsantsabane has no traditional or tribal areas and 90% of the population resides in the urban areas while 10% of the population resides on farms.

Due to the increase in mining activities in the Tsantsabane Municipality, the demand for housing has also increased. There was a 2.7% population growth between 2001–2011. In 2011 over 26% of the population was unemployed and

over 30% of the economically active population earned no income. Mining accounts for 55% of the GDP within the region. There are 9,839 households in Tsantsabane, with an average household size of 3.5 people. 72% of the residents live in formal dwellings. 67% of households use a flush toilet connected to sewerage and 45% have piped water inside. 57% receive weekly refuse removal. 59.6% of the houses have been fully paid off".

The majority of residents (6767 households) in the Tsantsabane Municipality reside in house or brick/concrete block structure houses, followed by those who live (21952 households) in informal dwelling (shack; not in backyard; e.g. in an informal/squatter settlement or on a farm). It is clear that the municipality needs to look at innovative ways to respond to the plight of people living in informal dwelling, which could be by means of in situation upgrade if the conditions allows for upgrade.



Graph 8: Dwelling types in the Tsantsabane Municipality.

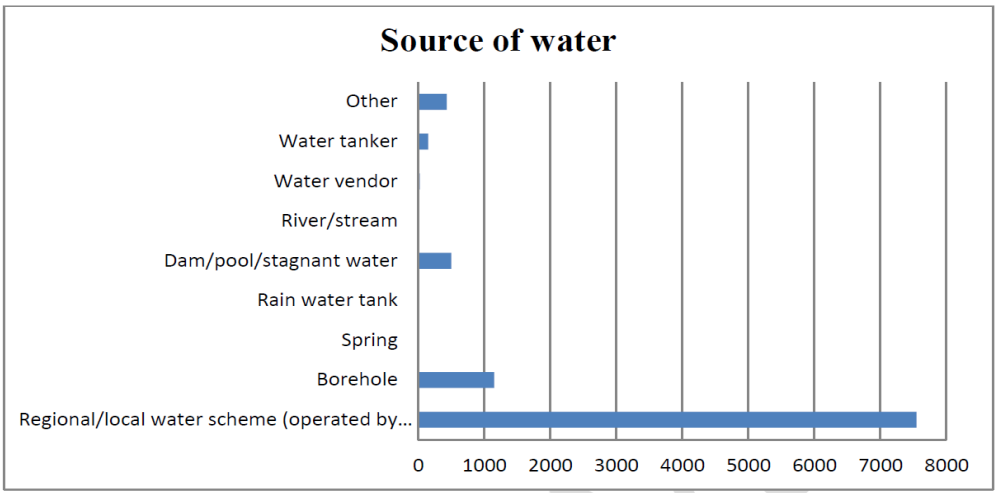
The population of the municipal area lives in three different types of dwellings; formal, informal and traditional. An increase in the proportion of households staying in formal dwellings, from 74.2% in 1996 to 81.6% in 2016 can be seen in table 16. Those who are staying in informal dwellings decreased significantly from 18.6% in 1996 to 4.6% in 2016. Just less than 10.0% of the population stays in traditional dwellings.

Table 16: 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

With regard to water provision in the Tsantsabane Municipality the percentage of households having access to pipe water inside their dwellings have also increased from 37.1% to 62% (2001 and 2011 period). The majority of Tsantsabane residents drink water that is from a water scheme. A small percentage drinks water from borehole. A concern is for those who drink water from dam/pool/stagnant water and other source as the water might not be safe to drink.



Graph 9: Sources of water for the Tsantsabane Municipality.

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

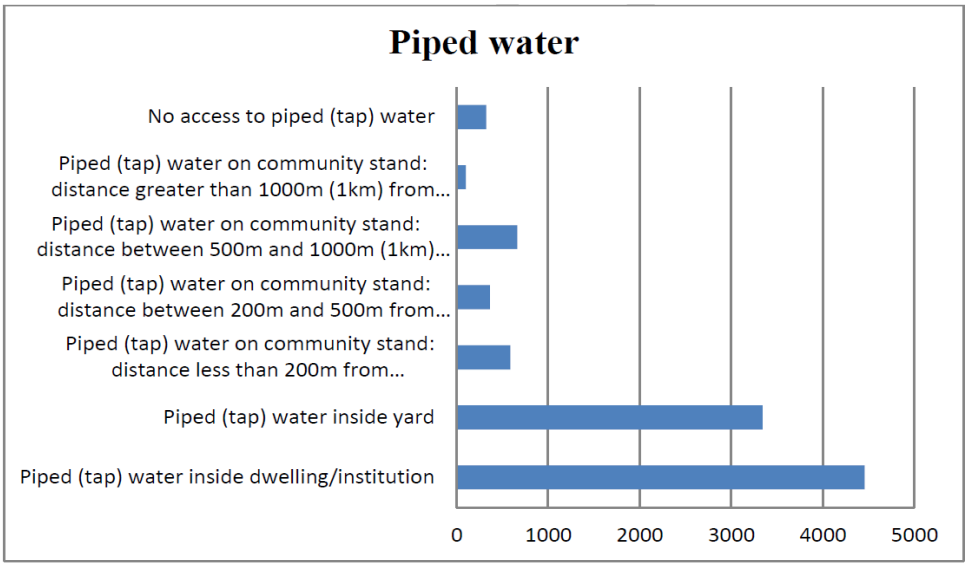
in the JTGDM. Two of these are associated with the Kuruman Eye, while two (the Klein Koning and Groot Koning eyes) are located south of the R273, and one is located at Manyeding. Intensive agriculture takes place in the vicinity of most of these eyes, except for those in Kuruman, which have been developed 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 17: 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

As stated previously, the percentage of total house holds which has access to pipe water inside their dwellings have increased from 37.1% to 62% from 2001 to 2011.



Graph 10: Access to piped water in the Tsantsabane Municipality.

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 18).

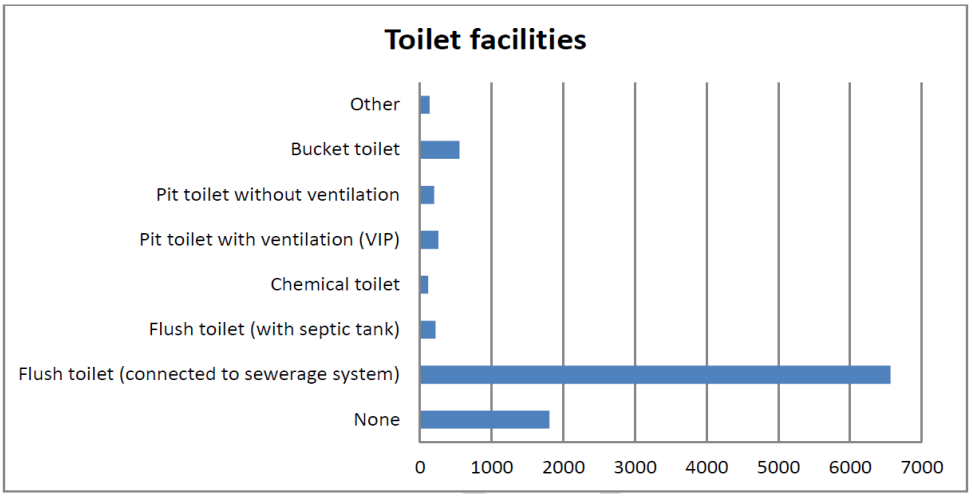
Table 18: Access to drinking water within JTGDM [Source: StatsSA 2016]

	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 Community Survey of 2007 for the Tsantsabane Municipality further indicates an improvement in sanitation and sewerage provision. However there are still 552 households that use buckets toilets. The majority of the residents (6563 households) use a flush toilet that is connected to a sewerage system.



Graph 11: Sanitation facilities for the Tsantsabane Municipality.

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 19: 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

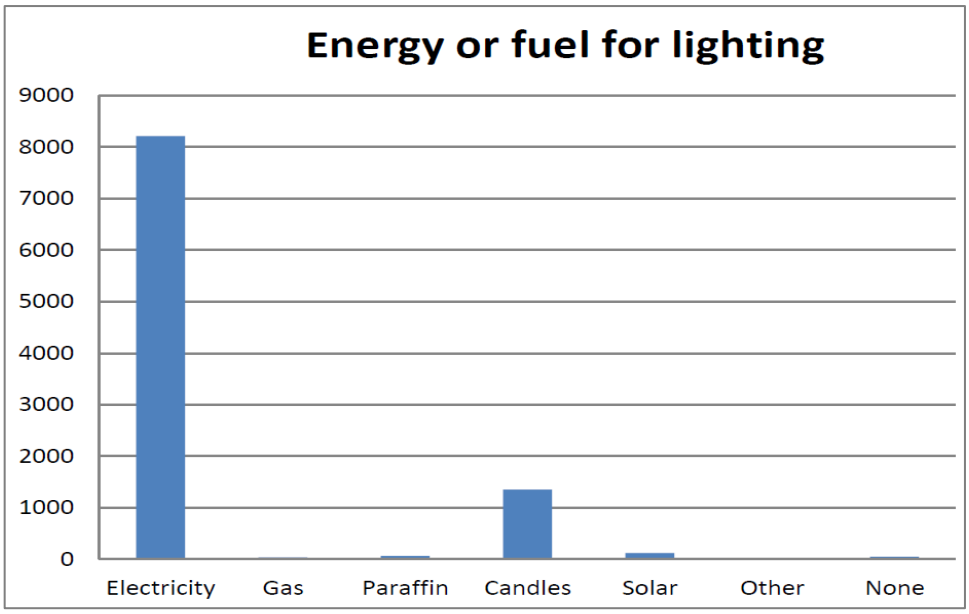
The table below (table 20) shows an increase in the proportion of households in the Ga-Segonyana municipality using a pit-latrine toilet, from 62.1% in 1996 to 67.4% in 2016. There is a slight decrease in the proportion of households that utilize flush or chemical toilets from 23.8% in 1996 to 23.4% in 2016.

Table 20: Type of sanitation facility used by household, 1996-2016 (Ga-Segonyana)

	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 a general increase in the number of people having access to electricity, across the country. 2011 Stats SA indicates that 8211 households use electricity for lighting while 1356 households use candles in the Tsantsabane Municipality.



Graph 12: Sources of energy for the Tsantsabane

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 21: 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 has been appointed by Wadala Mining 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 and hunting. The land capability for most of the study area is non-arable, with moderately low potential for grazing and wildlife, while the hills are classified as wilderness with very low land use potential. The agricultural region is demarcated for cattle farming, with the grazing capacity estimated at 13 Ha/LSU (on La Rochelle) and 15 Ha/LSU (on Gamahuli and Malley). The study area is not suitable for crop irrigation. Currently, the farms are primarily utilised as natural pastures for domestic livestock.

(2) Evidence of Disturbance:-

Some areas have been subject to small-scale historic diggings and irrigation.

(3) Existing Structures:-

Infrastructure
Existing infrastructure include roads, homesteads, farm buildings and dams.

Agriculture
Some wetlands and drainage lines have been modified for irrigation and now appear to be old/abandoned lands.

Public Roads
A few public gravel roads traverses the study area.

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)

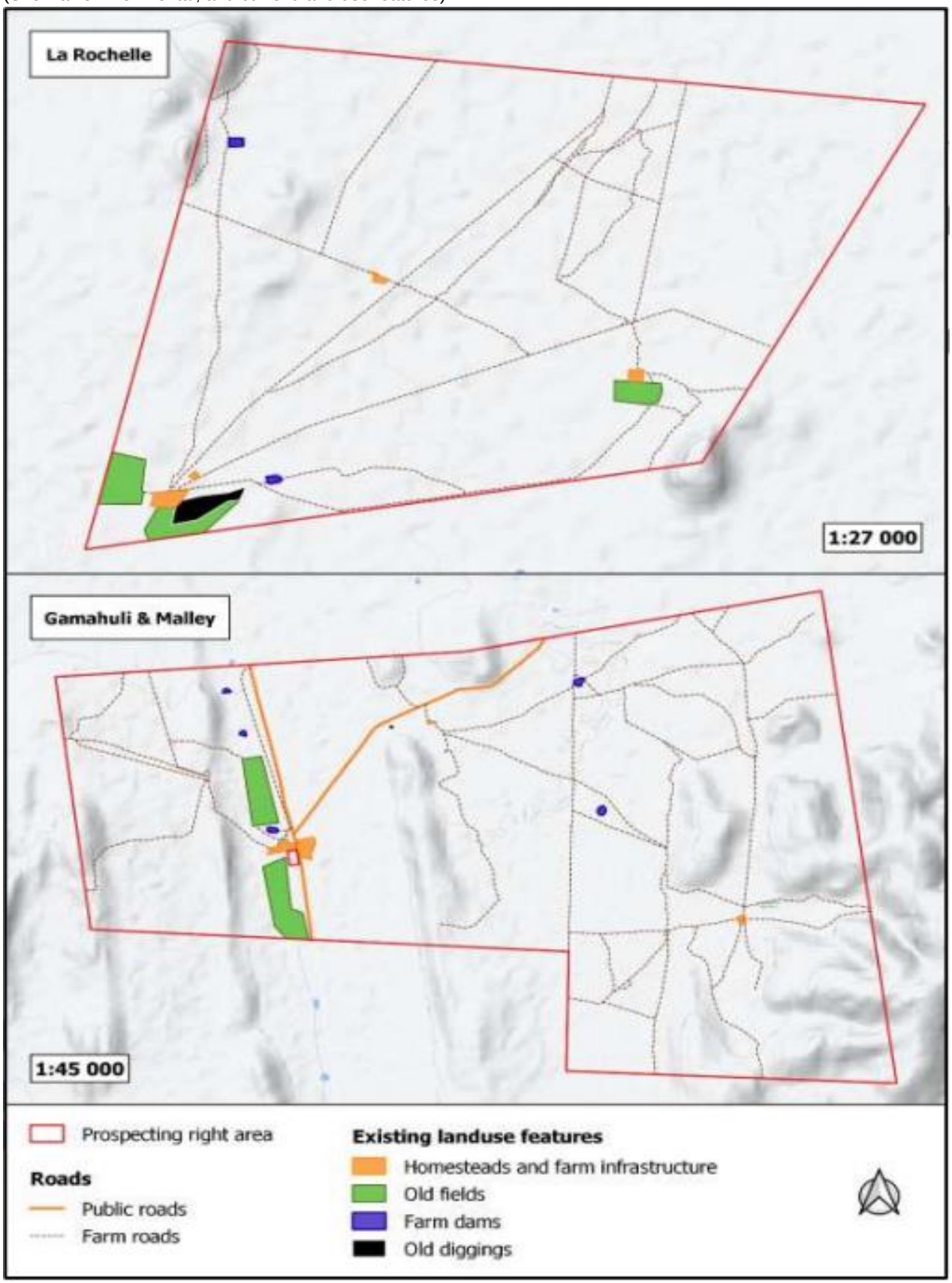


Figure 18. The existing land use features on the prospecting right area.

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	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	• Ground works and stripping of vegetation resulting in a changed land profile. • Runoff from stockpiled soil and vegetation may contain high levels of silt. • Significant levels of dust may emanate from the use of heavy vehicles which in turn will impact on runoff water quality. • Materials used may impact negatively on the runoff water quality.	Low Medium	Possible for life of operation	Residual	Regional	• Sufficient care must be taken when handling hazardous materials to prevent pollution. • Under no circumstances may ablutions occur outside the provided facilities. • If servicing and washing of the vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages. • A walled concrete platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicide and insecticides. • Oil residue shall be treated with oil absorbent and this material removed to an approved waste site. • Spill kits must be easily accessible and workers must undergo induction regarding the use thereof.
	• Spillages that may occur on access and haul roads may	Low Medium	Possible for life of operation	Residual	Local	

	impact negatively on surface water quality. This issue is dealt with in the EMP. • A high potential of soil erosion exists due to an increased percentage of bare surfaces.					• At all times care should be taken not to contaminate surface water resources. • Store all litter carefully to prevent it from washing away or blown into any of the drainage channels within the area. • Provide bins for staff at appropriate locations, particularly where food is consumed. • The prospecting site should be cleared daily and litter removed. • Conduct ongoing staff awareness programmes in order to reinforce the need to avoid littering, which contributes to surface water pollution.
	• Possible leaching of polluted soil through infiltration and runoff resulting in surface water pollution. • Removal of vegetation could lead to erosion and sediment transportation • Significant dust levels will	Low Medium	Possible for life of operation	Residual	Local	

	emanate from the use of heavy vehicles.					
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 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	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. • 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.

	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 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 During clearing of an area for excavations,	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.

	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 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					• 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 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

	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.					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	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.

	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 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	Low	Possible, temporarily	Residual	On-site	• Minimise the footprint of transformation.

	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 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					• 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.

	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.	Medium – High	Certain for life of operation	Residual	Regional	• 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 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

	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 between meta-populations occurring within the study site. Pockets of fragmented natural habitats hinder the growth and development of populations.					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.
	Disturbance, displacement and killing of fauna Vegetation clearing; excavations; increase in noise	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

	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 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					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 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.

	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, amphibians, and many invertebrates. Intentional killing of snakes, reptiles, vultures, and owls will negatively affect the local populations.					• 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.
Ecological Processes	During the clearing of vegetation for excavations and the construction of roads and infrastructure.	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.

	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 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					• Encourage the preservation of ecological corridors. • Employ sound rehabilitation measures to restore the characteristics of affected habitats.

	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	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.

	materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.					• 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	Low	Possible Infrequently	Decommissioning	Local	Equipment and/or machinery which will be used must comply with the manufacturer's

	stockpiling of topsoil. Noise increase at the prospecting site.					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 tanks):** 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 22 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 22. 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 23. 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 24. 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 25. 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 land capability for the site is 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.

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

- 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.
- 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 such as roads); followed by appropriate remedial actions.

Soil pollution

Level of risk: Low – Medium

Mitigation measures

- 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 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

Level of risk: Low - Medium

Mitigation measures

- Sufficient care must be taken when handling hazardous materials to prevent pollution.
- Under no circumstances may ablutions occur outside the provided facilities.
- If servicing and washing of the vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages.

- A walled concrete platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicide and insecticides.
- Oil residue shall be treated with oil absorbent and this material removed to an approved waste site.
- Spill kits must be easily accessible and workers must undergo induction regarding the use thereof.
- At all times care should be taken not to contaminate surface water resources.
- Store all litter carefully to prevent it from washing away or blown into any of the drainage channels within the area.
- Provide bins for staff at appropriate locations, particularly where food is consumed.
- The prospecting site should be cleared daily and litter removed.
- Conduct ongoing staff awareness programmes in order to reinforce the need to avoid littering, which contributes to surface water pollution.

Indigenous flora

Level of risk: Low to medium

Mitigation measures

- Implement best practise principles to minimise the footprint of transformation.
- Encourage proper rehabilitation of excavated areas, by effective backfilling and returning the stockpiled topsoil.
- 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.

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 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 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.

Alien invasive plants

Level of risk: Low to medium

Mitigation measures

- 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.

Encouraging bush encroachment

Level of risk: Low

Mitigation measures

- 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.

Fauna

Habitat Fragmentation

Level of risk: Medium-high

Mitigation measures

- All activities associated with the prospecting operation 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 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.
- Employ sound rehabilitation measures to restore characteristics of 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.
- However, if any of the protected species are threatened by destruction, the relevant permits from DENC should be obtained followed by the relevant mitigation 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.

Fauna

Ecological processes

Level of risk: Medium - High

Mitigation measures

- 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.

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 iterative 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 tanks 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. 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	Air quality Fauna Flora Groundwater Noise and vibration Soil Surface Water	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	Low

	Soil contamination Surface disturbance Surface water contamination	Topography Safety			MRD 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. 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	Air Quality Fauna Flora	Commissioning Operational Decommissioning	Medium	Dust Control and monitoring Noise control and monitoring Drip trays	Low

	Possible Groundwater contamination Surface water contamination Noise Removal and disturbance of vegetation cover and natural habitat of fauna Surface disturbance	Noise Soil Surface Water	Closure		Storm water run-off 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.	
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	Low

					that the associated water management infrastructure is effective in controlling erosion.	
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 are 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 Gamahuli, Malley & La Rochelle Kieselguhr Prospecting Operation** **By Dr Betsie Milne** **January 2022** **APPENDIX 4**	Five distinct plant communities were identified on site which were all considered to be of high sensitivity, primarily because of the high occurrences of plant species of conservation concern that occur widespread across the entire site as well as the important habitat associations for animal species of conservation concern. Although not unique plant communities, 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. Nevertheless, these impacts are all considered to have moderate and local effects. Species of conservation concern that are found in the areas earmarked for prospecting activities include *Ruschia griquensis* and *Vachellia erioloba*. The prospecting operation will also result in the large-scale clearance of indigenous vegetation. Permit applications regarding protected flora as well as the 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. Similarly, if any of the Vachellia erioloba trees is to be affected, 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. To conclude, the destruction of the natural plant species and habitats within the study area is inevitable, but 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 AND PALAEONTOLOGICAL DESK ASSESSMENT FOR THE PROSPECTING APPLICATION ON THE FARMS GAMAHULI, MALLEY AND LA ROCHELLE. **Dr. Edward Matenga** **14 July 2021** **APPENDIX 5**	In light of these findings it is recommended that the proposed mineral prospecting can go ahead subject to precautions taken to protect the burial ground. As archaeological deposits are usually buried underground, should archaeological artefacts or skeletal material be exposed when prospecting commences, work should be halted, and the provincial heritage resources authority or SAHRA notified for an investigation and evaluation of the finds.	X	Contained in the mitigation measures and EMPR
PALAEONTOLOGICAL IMPACT ASSESSMENT FOR THE PROSPECTING RIGHT APPLICATION ON FARM MALLEY, GAMAHULI AND LA ROCHELLE. **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

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.
- The Prospecting Area may have a low impact on air quality fauna, flora, noise, soil, surface water 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.

From the assessment of impacts throughout all the phases it is clear that though the impacts may occur directly as a result of the proposed start in prospecting operations, the impacts are mostly of medium significance before mitigation. According to the assessment carried out by the EAP the majority of the impacts can be reduced to a low significance with the appropriate mitigation measures in place.

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 19)**

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

The sensitivity map for the Alet Maritz Mynbou prospecting operation is illustrated in Figure 20. 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;

The study area does not comprise any natural wetlands, but several drainage channels flow through it.

Lastly Dr. Matenga noted the burial grounds on the farm La Rochelle. The graves are fenced off. As a standard precaution a 100m buffer will be reserved. If it becomes necessary for stated activities to be extended into the servitude, an application for a permit must be lodged with the heritage authority. (Figure 13. Burial ground on La Rochelle and prescribed servitude).

Please see Final Site Map below.

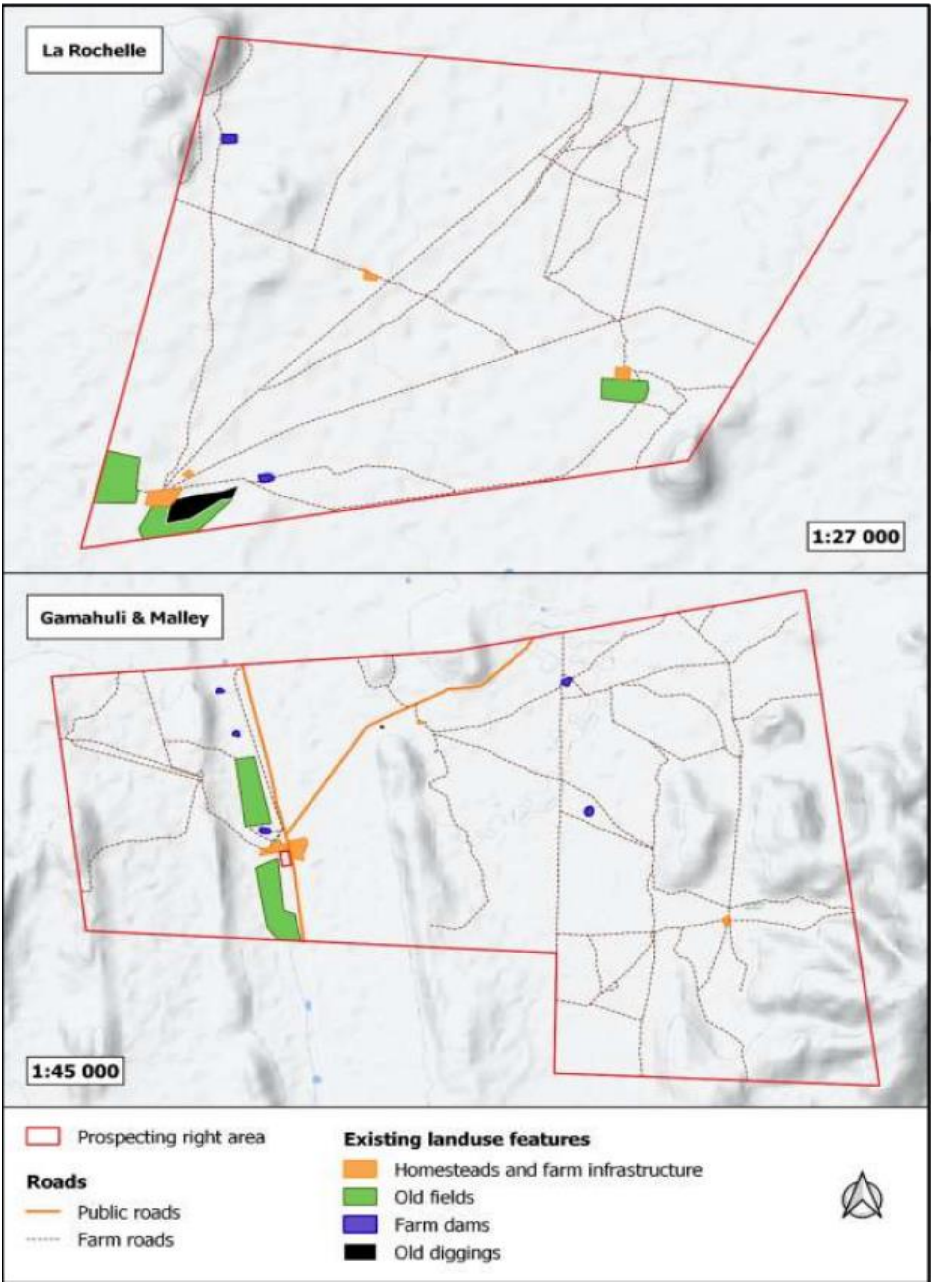


Figure 19. Existing land use features map (Dr. B Milne, Ecological report).

(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 groundwater. 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 on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR are adhered to e.g. ongoing environmental management and rehabilitation once the prospecting reaches its end of life.

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

- 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 in order to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes (ideally no longer than two months) in order 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 allowing for the re-growth of the seed bank contained within the topsoil. In all places of development, the first 300mm of loose or weathered material found will be classified as a growth medium. The topsoil must be removed where possible, from all areas where physical disturbance of the surface will occur.
- 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.
- The operation must co-ordinate different activities in order 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) in order 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 such as roads); followed by appropriate remedial actions.

Flora

- Implement best practise principles to minimise the footprint of transformation.
- Encourage proper rehabilitation of excavated areas, by effective backfilling and returning the stockpiled topsoil.
- 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.
- 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 individuals, and should include a monitoring programme for at least two years after re-establishment in order 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.
- 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.

Fauna

- All activities associated with the prospecting operation 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 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.
- Employ sound rehabilitation measures to restore the characteristics of any affected habitats.
- Careful planning of the operation is needed in order 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 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.
- 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.

Surface water

- The disposal of oil, grease and related industrial waste must be transported to the stores area where it will be stored in steel containers supplied by an oil recycling contractor. All oil and grease must be removed on a regular basis from the operation by a registered approved contractor.
- All refuse and waste from the different sections must be handled according to NEMA Guidelines. Recycling of waste is encountered in all the consumer sections of the operation, where recyclable materials must be collected before dumping them in the domestic waste disposal area.
- All non-biodegradable (recyclable) refuse such as glass bottles, plastic bags and metal scrap must be stored in a container in the waste area and collected on a regular basis and disposed of at a recognized disposal facility.
- Erosion and storm water control measures must be implemented.
- An application for an integrated Water Use Licence must be submitted at the Department of Water and Sanitation for all actions to be performed which requires authorization in terms of water uses.
- Vehicle repairs must only take place within the maintenance area for vehicles. Repairs within open excavations must be limited to emergency break downs with drip trays.
- Re-fuelling must only take place in the re-fuelling area. If this is found not to be practical, drip trays must be used whenever re-fuelling takes place outside of this area.
- During rehabilitation the application must endeavour to reconstruct flow patterns in such a way that surface water flow is in accordance with the natural drainage of the area as far as practically possible.

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.

1. 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.
2. 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.
3. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
4. 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.
5. 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.
6. 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.
7. 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 (including the re-establishment of vegetation).
- 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 mined 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.

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.

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.

vi) 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 DMRE, a financial rehabilitation guarantee to the amount as calculated in terms of the financial quantum Guideline and approved by the DMRE.

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 several drainage channels 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 and Energy.

Submission of Information:

- Reports on rehabilitation and monitoring should be submitted annually to the Department of Mineral Resources and Energy – 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 Kieselguhr 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 R176 100.00 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 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.

The findings of these studies indicated that the proposed prospecting operation will have very little impact, if any, on the heritage and palaeontological resources in the area. Dr. Matenga stated that some artifacts dating back to the Stone Age (all three epochs from the Earl Stone Age through the Middle Stone Age to the Later Stone Age) was found on the farm Malley along the quartzite ridge. These artifacts include hand-axes, a cleaver and a scraper as well as flake tools. However, there were no significant concentrations of artefacts to warrant further mitigation action.

Some buildings and structures were noted in all three the farms, however, the farmhouse, the principal dwelling structure, built in 1921 on the La Rochelle farm is of particular significance. The house is an exemplar of the architectural quality of houses in rural area at the time (1921). The house will not be affected by the project, neither are there any compelling circumstances for alteration or destruction of the building without permission being sought from the heritage authority.

Lastly Dr. Matenga noted the burial grounds on the farm La Rochelle. The graves are fenced off. As a standard precaution a 100m buffer will be reserved. If it becomes necessary for stated activities to be extended into the servitude, an application for a permit must be lodged with the heritage authority.

Furthermore, Dr. Bamford stated the chance of fossils occurring on any of the sites are highly unlikely since no palaeo-spring and palaeo-pan sites, which is usually associated with fossils, could be observed on the satellite imagery.

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. 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.

Should any other heritage or archaeological 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.

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)

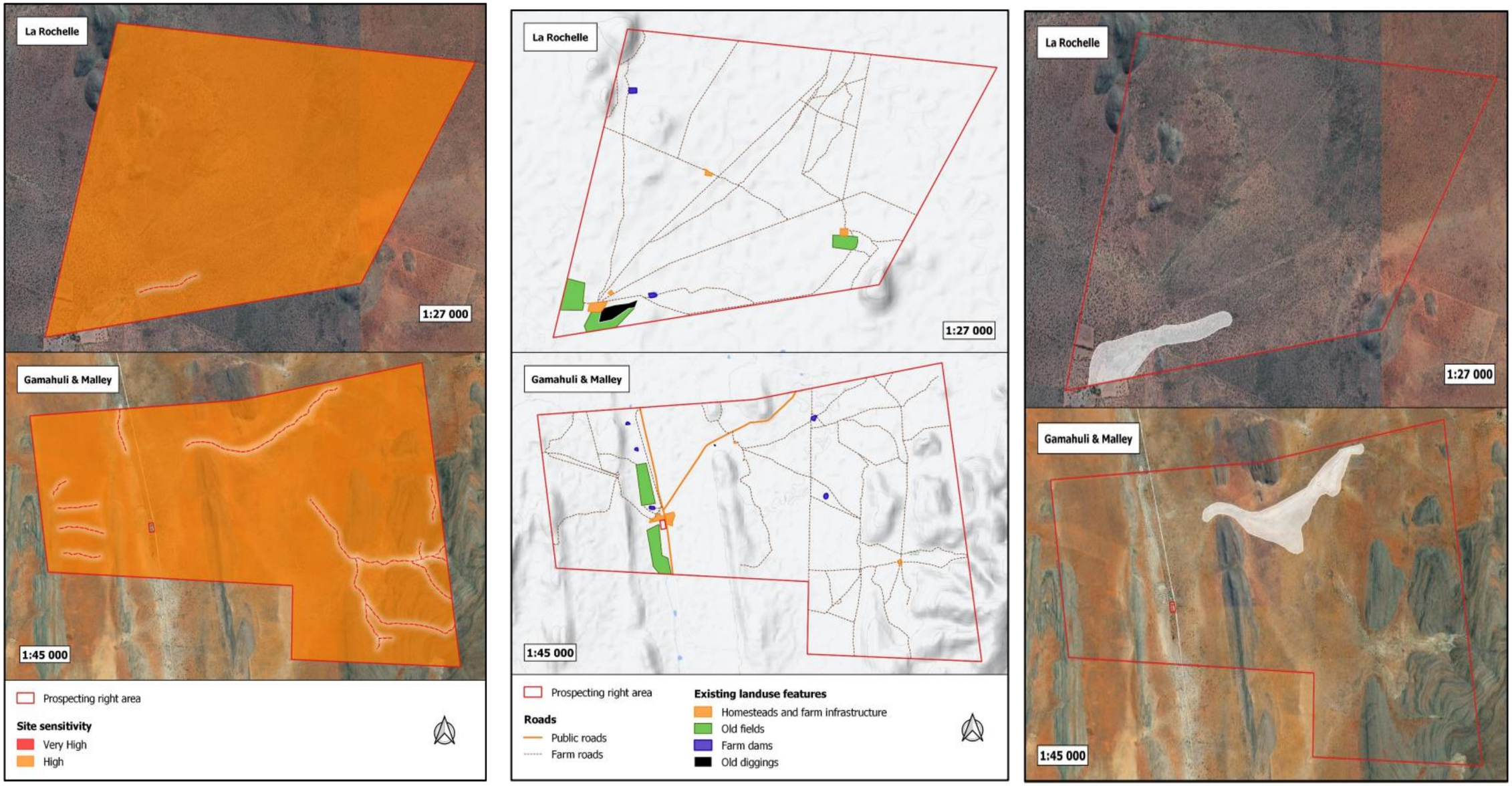


Figure 20. A sensitivity map for the Alet Maritz Mynbou prospecting area indicating areas of high (orange) and very high (red) sensitivity, the map with existing land use features and the target areas for the prospecting operations.

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 DMRE. 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 kieselguhr.

viii) Has a water use licence been applied for?

A Water use Licence application (WULA) will be prepared and submitted only for section 21 (c) and (i) uses if necessary.

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 tanks and bund walls. Oil traps Drip tray at re-fuelling point Immediately clean hydrocarbon spill.		Removal of diesel tanks upon closure of Prospecting Right.
Prospecting Area.	Commissioning Operational Decommissioning Closure	Provision is made for a maximum footprint (at full production) of 25 hectares at any one time.	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 0.2ha 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	Additional prospecting haul road	Maintenance of roads Dust control and monitoring		Upon cessation of the individual activity (continuous rehabilitation)

	Closure		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		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 car/tank)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna	Soil Groundwater Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of Diesel tanks/car and bund walls. Oil traps Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over suitable drip	Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

	Soil contamination Surface disturbance			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.	
Prospecting Area	Dust 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 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	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.

	Surface water contamination			Erosion control Noise control 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.
Gravel 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	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	Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

become necessary				infrastructure is effective in controlling erosion.	
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 tanks/ car)	Groundwater contamination Removal and disturbance of vegetation cover	Maintenance of Diesel tanks/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;

	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination			• 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.
Stockpile area	Surface Water contamination Removal and disturbance of		Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized

	vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination		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.	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 Groundwater 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.

(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 m^2 (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 ±25 ha in total but 2ha 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 ± 1 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 176 100.00 (Please see table 26 below for calculation).

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

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

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
Remark:							
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	15,68	1	1	0
					1	1	
2 (A)	Demolition of steel buildings and structures	m2	50	218,41	1	1	10920,5
2(B)	Demolition of reinforced concrete buildings and structures	m2	50	321,86	1	1	16093
3	Rehabilitation of access roads	m2	1500	2,29	1	1	3435
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	379,34	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	206,91	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	436,81	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	2	222313,32	0,04	1	17785,0656
7	Sealing of shafts adits and inclines	m3	0	117,25	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,1	152653,61	1	1	15265,361
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	190127,32	1	1	0
					1	1	
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	552219,84	1	1	0
					1	1	
9	Rehabilitation of subsided areas	ha	0	127824,41	1	1	0
10	General surface rehabilitation	ha	0,5	120927,41	1	1	60463,705
11	River diversions	ha	0	120927,41	1	1	0
12	Fencing	m	0	137,94	1	1	0
13	Water management	ha	0	45980,00	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0,5	16093,00	1	1	8046,5
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum	0			1	0
					Sub Total 1		132009,1316
1	Preliminary and General		7920,547896		weighting factor 2 1		7920,547896
2	Contingencies				13200,91316		13200,91316
					Subtotal 2		153130,59
					VAT (15%)		22969,59
					Grand Total		**176100**

Table 26: Financial Quantum

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. Except if required by DWS	Site Manager/Water Supply	The study area does not comprise any natural wetlands, but several drainage channels flow through it.

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 DMRE 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 awareness 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 DMRE 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.

_____

Signature of the Environmental Assessment Practitioner:

Wadala Mining and Consulting Pty Ltd

_____

Name of Company:

Date: 11 May 2022

- END –

APPENDIX 3 PUBLIC PARTICIPATION