



mineral resources

Department:

Mineral Resources

REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING IN CASES OF KIESELGUHR PROSPECTING

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED 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

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

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

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or 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.

OBJECTIVE OF THE SCOPING PROCESS

The objective of the scoping report is to, through a consultative process—

- (a) identify the relevant policies and legislation relevant to the activity;
- (b) motivate 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 and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- (d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- (e) identify the key issues to be addressed in the assessment phase;
- (f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- (g) identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

2) 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**
Postal Address: **P.O. Box 110823,
Hadisonpark;
8306**

ii) Appointed by:

Alet Maritz Mynbou (Pty) Ltd

iii) Expertise of the EAP

(b) The qualifications of the EAP

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:	<p>The Farm Gamahuli No. 495 and the 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.</p> <p>Farm No: 495</p> <p>Farm Name: Gamahuli, Portion o</p> <p>Administrative District: Kuruman</p> <p>Province: Northern Cape</p> <p>Title Deed No: T1212/1999</p> <p>Extent : 2 542.5125 ha</p> <p>Owner: Pieter Thomas Sweetnam</p> <p>Farm No: 498</p> <p>Farm Name: Malley, Portion o (Remaining Extent)</p> <p>Administrative District: Kuruman</p> <p>Province: Northern Cape</p> <p>Title Deed No: T1/2007</p> <p>Extent : 2 636.6324 ha</p> <p>Owner: Jacobus Lukas van der Merwe</p> <p>Farm No: 359</p> <p>Farm Name: La Rochelle, Portion o</p> <p>Administrative District: Kuruman</p> <p>Province: Northern Cape</p> <p>Title Deed No: T1089/1969</p> <p>Extent : 1 915.3412 ha</p> <p>Owner: Johannes Stephanus Jordaan</p>
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 properties are located 50km west and south west of Kathu.
21 digit Surveyor General Code for each farm portion	<p>Co4100000000049500000</p> <p>Co4100000000049800000</p> <p>Co4100000000035900000</p>

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

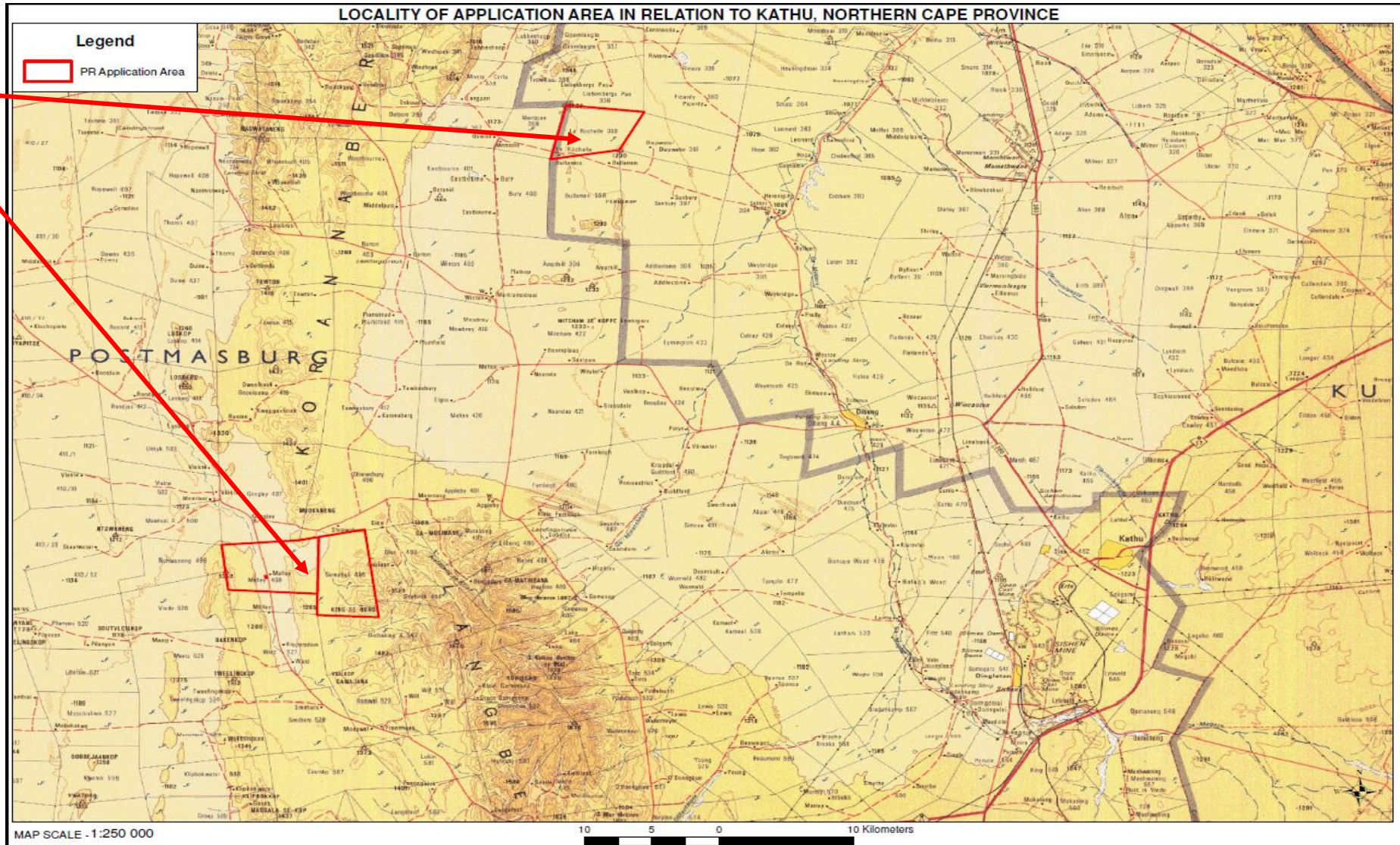


Figure 1. 1:250 000 topocadastral map indicating the application area in RED.

d) Description of the scope of the proposed overall activity

i) Listed and specified activities

(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)

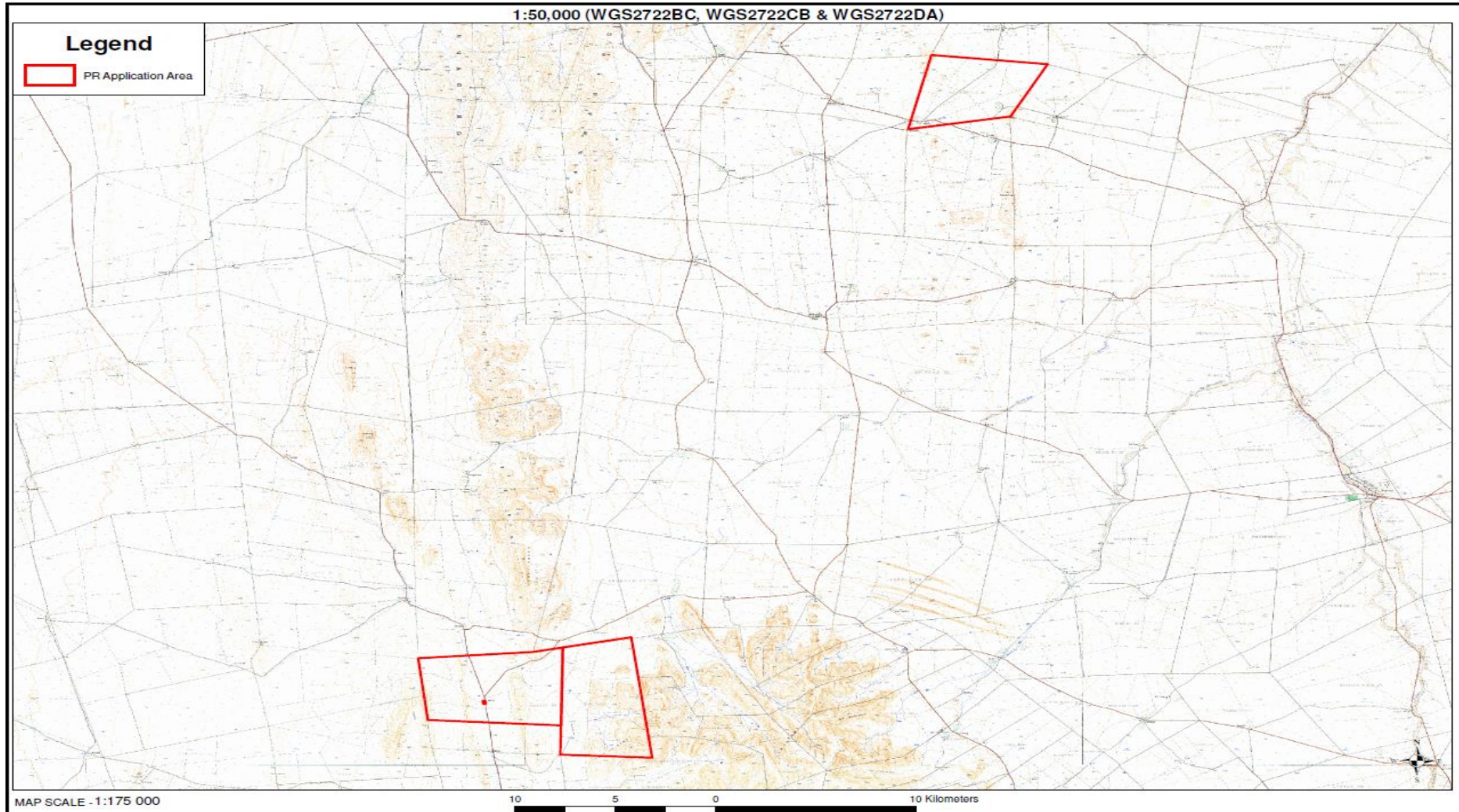


Figure 2. Location, and area (7094.4861 ha) of all the aforesaid main and listed activities, and infrastructure to be placed on site.

Table 1: Listed and Specified Activities

<p>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.)</p>	<p>Aerial extent of the activity (Ha or m²)</p>	<p>Listed Activity (mark with an X where applicable or affected)</p>	<p>Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed GNR983, GNR984, GNR985/ Not listed)</p>
<p>Activity 9: "The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (vii) with an internal diameter of 0.36 metres or more; or (viii) with a peak throughput of 120 litres per second or more;</p>	<p>Water distribution Pipelines</p>	<p>X</p>	<p>NEMA: LN1 (GNR327)</p>
<p>Activity 12: "The development of— 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)</p>	<p>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.</p>	<p>X</p>	<p>NEMA: LN1 (GNR327)</p>
<p>Activity 20: Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including – (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, crushing, screening or washing;</p>	<p>~7094.4861ha The total area will NOT be prospected. Invasive Prospecting Pits 300 pits 2m X 3m X 0.5 - 5m 50 trenches 100m X 50m X 0.5 – 5m = 25.18 ha</p>	<p>X</p>	<p>NEMA: LN1 (GNR327)</p>

<p>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.</p>	<p>Pits that prove to contain kieselgurh (tested positive). It is estimated that on average 0.5 m of overburden (calcrete and soil) will be removed before accessing the kieselguhr layer (average width 0.5 - 5m).</p>		
<p>Activity 24(ii) of NEMA Listing Notice 1</p> <p>The development of a road-</p> <p>(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</p> <p>(ii) With a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;</p> <p>But excluding a road-</p> <p>(a) Which is identified and included in activity 27 in Listing Notice 2 of 2014;</p> <p>(b) Where the entire road falls within an urban area; or</p> <p>(c) Which is 1 kilometre or shorter.</p>	<p>±1500m² on the Area.</p>	<p>X</p>	<p>NEMA: LN1 (GNR327)</p>
<p>Activity 15 of NEMA Listing Notice 2</p> <p>The clearance of an area of 20 hectare or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-</p> <p>(i) The undertaking of a linear activity; or</p> <p>(ii) Maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>A total of 25 hectares will be physically disturbed were the kieselgurh material will be removed.</p>	<p>X</p>	<p>NEMA: LN2 (GNR325)</p>

<p>Activity 19: The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including-</p> <p>(a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or</p> <p>(b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing.</p> <p>The Maritz operation directly relates to prospecting of a mineral resource (Kieselgurh) and requires permission in terms of Section 20 (MPRDA), for the removal and disposal of bulk samples of any minerals.</p>	<p>~7094.4861ha. Although the total area will never be prospected and the footprint with the bulk sampling is calculated to be ±25ha.</p>	<p>X</p>	<p>NEMA: LN2 (GNR325)</p>
<p>(15) The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a prospecting right or mining permit, in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</p>	<p>0.2ha</p>		<p>NEMWA: Category A (GNR 633)</p>
<p>Office complexes Temporary workshop facilities Storage facilities Concrete bund walls and diesel depots Ablution facilities Topsoil stockpiles Overburden stockpiles</p>	<p>± 200 m² ± 300 m² ± 2 00 m² ± 250 m² ± 30 m² ± 300 m² ±300 m²</p>		<p>Not Listed</p>
<p>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:</p> <ul style="list-style-type: none"> • Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste. 	<p>5m x 10m = 50m²</p>		<p>Not Listed</p>

ii) Description of the activities to be undertaken

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

PHASE 1**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 alluvial gravels.

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**

This activity requires that an application IN TERMS OF Section 20 of the Act is specifically included in your application for a prospecting Right and cannot be proceeded with if such permission is not specifically granted.

(Bulk sampling is a sampling technique ONLY- it cannot be used to conduct mining operations. The following table must be completed for Bulk Sampling)

Table 2: Bulk Sampling Activities

ACTIVITY		DETAILS		
Number of pits/trenches planned		300 pits/ 50 trenches		
	Number of pits/trenches	Length	Breadth	Depth
	300 pits	2m	3m	0.5 - 5m
	50 trenches	100m	50m	0.5 – 5m
Locality		The location of the trenches will be verified during a site reconnaissance visit and after the pre-feasibility studies has been compiled.		

Volume Overburden (Waste)	Pits (300 X 2 X 3 X 0.5) = 2100m ³ Trenches (50 X 100 X 50 X 1) = 250 000m ³
Volume Ore	Pits 1050 m ³ Trenches 125 000 m ³
Density Overburden	1.8
Density Ore	0.4
Phase(s) when bulk sampling will be required	Month 13 – 49 Phase 4
Timeframe(s)	From time to time during Month 13 - 49

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

PHASE 4

Analytical Desktop Study

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

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

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

SCOPING REPORT –ALET MARITZ MYNBOU PTY LTD (Gamahuli, Malley and La Rochelle)

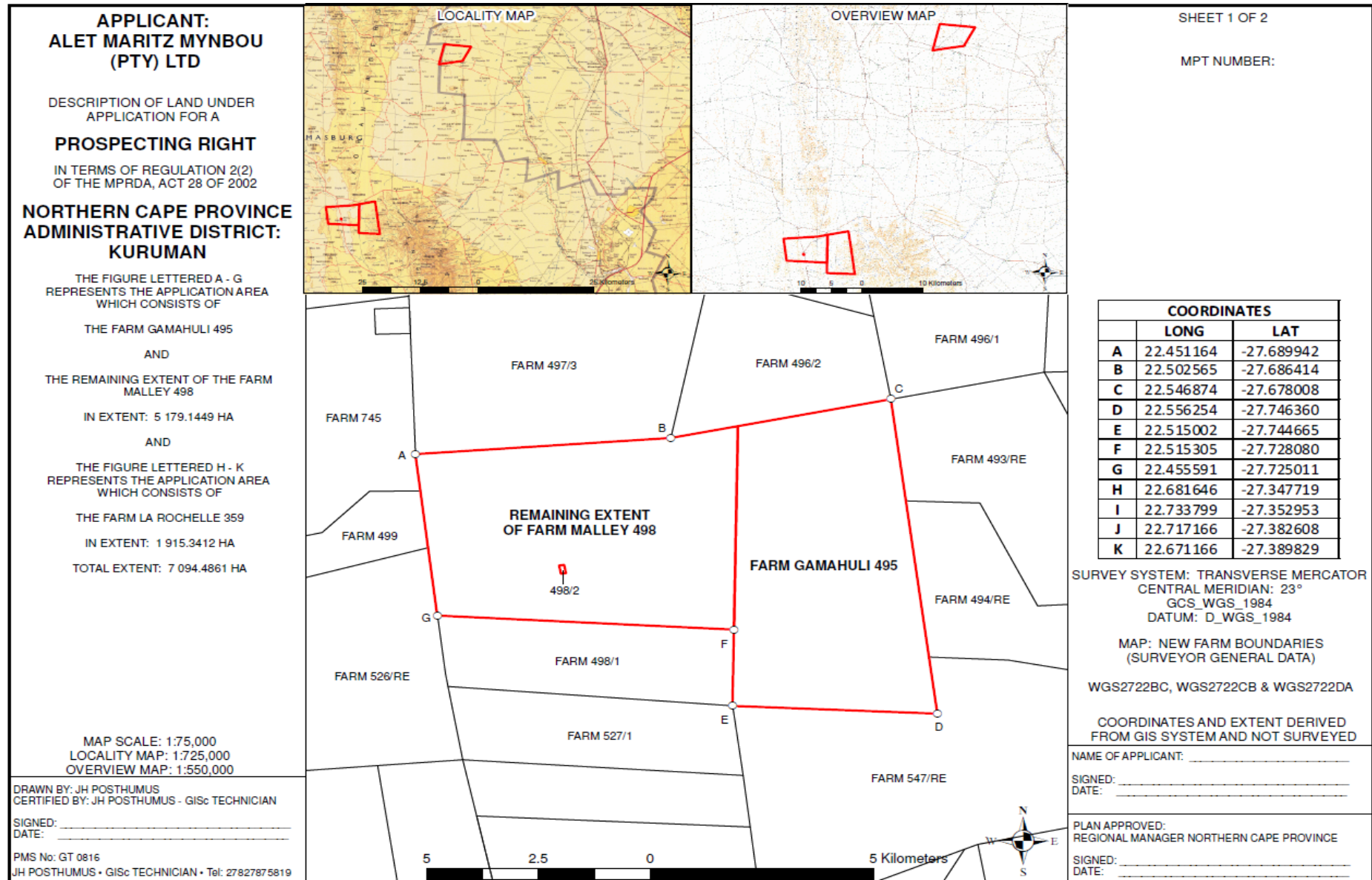


Figure 3. The farm Gamahuli no.495 and the Remaining Extent of the Farm Malley no. 498 in the district of Kuruman.

SCOPING REPORT –ALET MARITZ MYNBOU PTY LTD (Gamahuli, Malley and La Rochelle)

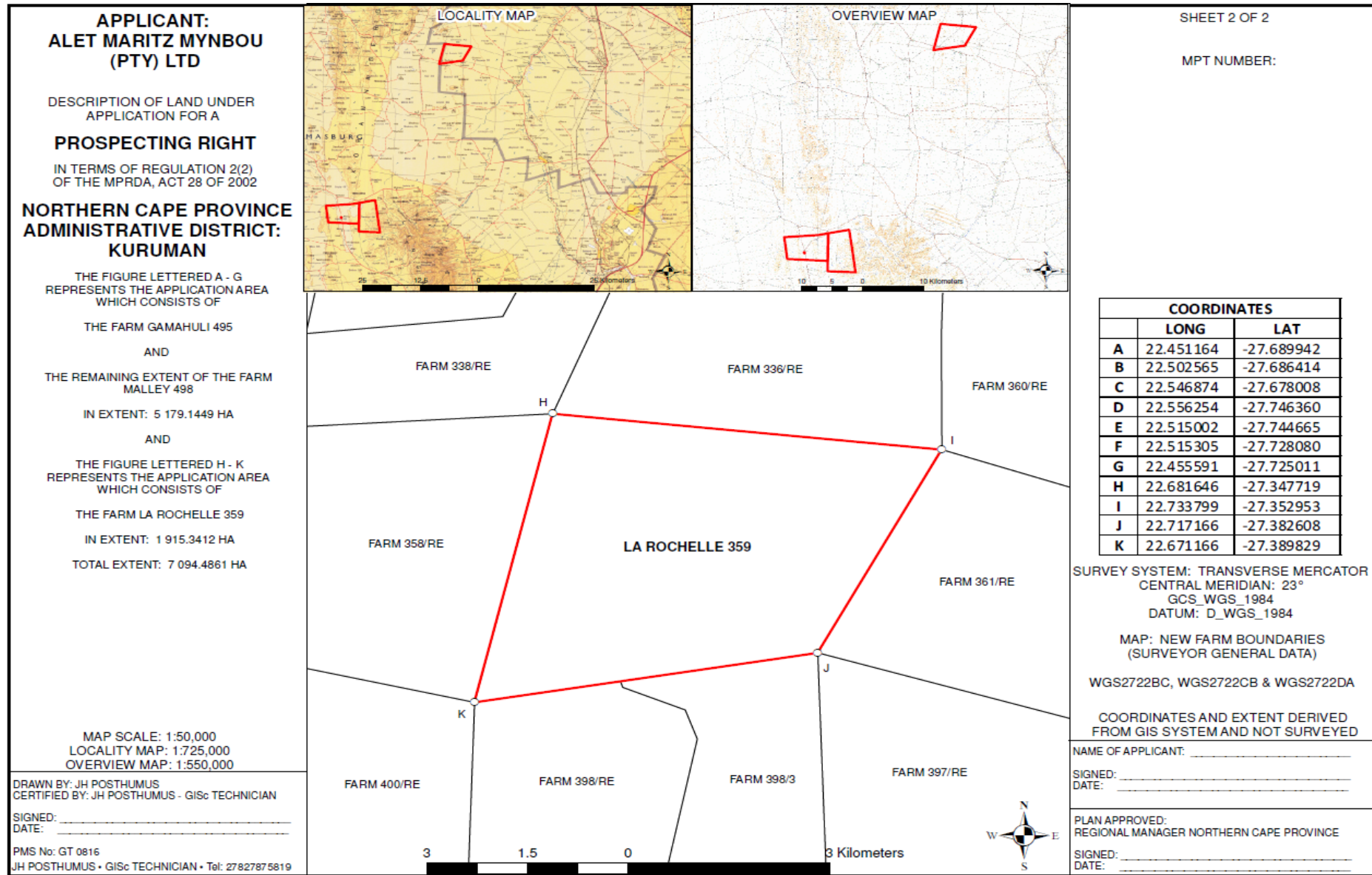


Figure 4. The Farm La Rochelle No. 359 in the district of Kuruman.

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

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

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

Waste Management

Proper sanitation facilities will be provided for employees. No person will pollute the workings with faeces or urine, misuse the facilities provided or inappropriately foul the surrounding environment with faeces or urine. Acceptable hygienic and aesthetic practices will be adhered to. Non-biodegradable refuse such as glass bottles, plastic bags, etc. will be sorted and stored in separate lockable containers at a central point. It will be disposed of at a recognised disposal facility regularly. Biodegradable refuse will either be handled as indicated, or be buried in a pit excavated for that purpose and covered with layers of soil when almost full. A final 0,5m thick layer of topsoil will be incorporated where practicable. Provision will be made for the future subsidence of the covering. Refuse will not be dumped in the vicinity of the prospecting area. Waste material with regard to vehicle repairs will be kept in 200 litres steel containers in the maintenance/farmstead area. This material will be disposed of at a recognised disposal facility once a month.

Access Roads

The properties Gamahuli and Malley are ± 35 km north west of Olifantshoek and can be accessed by a gravel road that begins ±900 m outside of Olifantshoek on the N14 to Upington. La Rochelle can be accessed by a gravel road that goes from Kathu to Deben to Hotazel. Activities associated with the Mine that is expected to make use of these roads include:-

- o The transportation of personnel to and from the site;
- o Delivery of supplies and materials;
- o 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

Table 3: Applicable legislation and guidelines used to compile the report

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)	<ul style="list-style-type: none"> - 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 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Constitution of South Africa (Act 108 of 1996)	<ul style="list-style-type: none"> - Section 24: Environmental right - Section 25: Rights in Property - Section 27: Water and sanitation right 	<ul style="list-style-type: none"> - To be implemented upon the approval of the EMPR.
Environment Conservation Act (Act 73 of 1989) and Regulations (ECA)	<ul style="list-style-type: none"> - Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities that still relate to the existing section of ECA. - Section 28A: Exemptions. 	<ul style="list-style-type: none"> - To be implemented upon the approval of the EMPR.
Fencing Act (Act 31 of 1963)	<ul style="list-style-type: none"> - 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. 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.

SCOPING REPORT –ALET MARITZ MYNBOU PTY LTD (Gamahuli, Malley and La Rochelle)

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)	- Control measures are to be implemented upon the approval of the EMPR.

	<ul style="list-style-type: none"> - Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations) - Regulations GN R1147, published on 20 November 2015 in terms of NEMA (Financial Provision) 	
<p>National Environmental Management: Air Quality Act (Act 39 of 2004)</p>	<ul style="list-style-type: none"> - 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) 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR. - This is also legislated by Mine Health and Safety from DMR and is to be adhered to.
<p>National Environmental Management: Biodiversity Act (Act 10 of 2004)</p>	<ul style="list-style-type: none"> - 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. <p>Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007 GNR 150/GG 29657/23-02-2007</p>	<ul style="list-style-type: none"> - A permit application regarding protected plant species need to be lodged with DENC if any protected species is encountered. Control measures are to be implemented upon the approval of the EMPR.

	<p>Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 *</p> <p>Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 *</p> <ul style="list-style-type: none"> - 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 fo 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) 	
<p>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.</p>	<ul style="list-style-type: none"> - Chapter 2 lists all protected areas. 	<ul style="list-style-type: none"> - This will be established with a specialist study. It is not anticipated that the prospecting operation fall within any protected area which is known.
<p>National Environmental Management: Waste Management Act (Act 59 of 2008)</p>	<ul style="list-style-type: none"> - Chapter 4: Waste management activities - Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations) 	<ul style="list-style-type: none"> - To be implemented upon the approval of the EMPR.

	<ul style="list-style-type: none"> - 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) - 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) 	
<p>National Forest Act (Act 84 of 1998) and Regulations</p>	<ul style="list-style-type: none"> - 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. 	<ul style="list-style-type: none"> - A permit application regarding protected tree species need to be lodged with DAFF if necessary. - Control measures are to be implemented upon the approval of the EMPR.
<p>National Heritage Resources Act (Act 25 of 1999) and Regulations</p>	<ul style="list-style-type: none"> - 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 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR. Fossil finds procedure will be attached to the PIA.

	<p>authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a forma cemetery administered by a local authority.</p> <ul style="list-style-type: none"> - Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during HIA process. - Regulation GN R548 published on 2 June 2000 in terms of NHRA 	
<p>National Water Act (Act 36 of 1998) and regulations as amended, <i>inter alia</i> Government Notice No. 704 of 1999</p>	<ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> (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; 	<ul style="list-style-type: none"> - A water use application WILL NOT be submitted as no water is necessary for the prospecting. All drinking water is transported to the site. - Control measures are to be implemented upon the approval of the EMPR.

	<ul style="list-style-type: none"> - Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining 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) - 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)	<ul style="list-style-type: none"> - Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of Flora. 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Occupational Health and Safety Act (Act 85 of 1993) and Regulations	<ul style="list-style-type: none"> - 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. 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Road Traffic Act (Act 93 of 1997) and Regulations	<ul style="list-style-type: none"> - Entire Act. 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.

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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.
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 (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

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).

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

The Olifantshoek and Kathu areas are a very water scarce region and live stock farming are strickly limited due to the small amount of water that is available in the region.

The areas applied for is over the farm Gamahuli, the remaining extent of the farm Malley and the farm La Rochelle, the kieselguhr is a diatomaceous earth which consists mainly of accumulated shells or frustules of intricately structured amorphous hydrous silica secreted by diatoms.

The Diatom exists in many different environments and are abundant in regions of oceanic upwelling :12 000 to 16 000 species of diatoms live in fresh, brackish, or saline waters.

As the Olifantshoek and Kathu areas only have the iron ore and manganese operations the Kieselgurh can also be a source of income and the Kieselgurh prospecting operation in the areas would provide an income for the region and jobs for the neaby community.

g) Period for which the environmental authorisation is required

5 years with the possibility of renewal of the Right for another 3 years.

h) Description of the process followed to reach the proposed preferred site

NB!! – This section is not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration (1) 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.

In order to ensure that the proposed development enables sustainable development, a number of feasible options must be explored. Motivation for the footprint of the actual prospecting operation (i.e. excavations) will not be provided here, as the location of the prospecting is determined by the possible geological location of the mineral resource (as discussed in section f).

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

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

A standard phased approach to all prospecting activities will be implemented. Each prospecting activity will be undertaken on a scheduled timeline, with some activities being run concurrently, while others sequentially.

i) Details of the development footprint alternatives considered

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

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

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

THE FARM GAMAHULI 495 AND

THE REMAINING EXTENT OF THE FARM MALLEY 498 IN EXTENT: 5 179.1449 HA AND

THE FARM LA ROCHELLE 359 IN EXTENT: 1915.3412 HA

TOTAL EXTENT: 7 094.4861 HA

ADMINISTRATIVE DISTRICT KURUMAN

Alternatives considered:-

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

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

(b) The type of activity to be undertaken:

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

Land Use

No specialist comparative land use assessments were conducted, but the prospecting areas has agricultural potential and is used for grazing by the property owners.

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

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

Project Infrastructure

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

Prospecting Method

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

PHASE 1

Review of Past Exploration Results

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

Imagery Analysis & Geological Mapping

High-resolution satellite images will be studied and used to map the geology the application area. Contacts between various lithologies will be mapped and specific attention will be given to delineate and define areas underlain by alluvial gravels.

PHASE 2

Invasive Prospecting Pits

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

PHASE 3

Description of Bulk Sampling Activities

This activity requires an application IN TERMS OF Section 20 of the Act is specifically included in your application for a Prospecting Right and cannot be proceeded if such permission is not specifically granted.

(Bulk sampling is a sampling technique ONLY- it cannot be used to conduct mining operations. The following table must be completed for Bulk Sampling)

Table 4: Bulk Sampling Activities

ACTIVITY		DETAILS		
Number of pits/trenches planned		300 pits/ 50 trenches		
	Number of pits/trenches	Length	Breadth	Depth
	300 pits	2m	3m	0.5 - 5m
	50 trenches	100m	50m	0.5 – 5m
Locality		The location of the trenches will be verified during a site reconnaissance visit and after the pre-feasibility studies has been compiled.		
Volume Overburden (Waste)		Pits (300 X 2 X 3 X 0.5) = 2100m ³ Trenches (50 X 100 X 50 X 1) = 250 000m ³		
Volume Ore		Pits 1050 m ³ Trenches 125 000 m ³		
Density Overburden		1.8		
Density Ore		0.4		
Phase(s) when bulk sampling will be required		Month 13 – 49 Phase 4		
Timeframe(s)		From time to time during Month 13 - 49		

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

PHASE 4

Analytical Desktop Study

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

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

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

There is no alternative prospecting method for the prospecting of kieselghur.

(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 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).
- Equipment: One 40-t articulated dump trucks supported by 1 excavator and one front-end loader
- 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.
 - Temporary Workshop Facilities and Wash bay.

- 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. The final location of the fuel storage tanks will be determined based on proximity to site operations.

The proposed prospecting area is not located near any surface water resources such as rivers or dams and thus the only viable water source will be ground water. However, the proposed sites does have non-perrinial drainage line which may contain water during heavy rainfall events, but this is very unlikely since the sites are located in a 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 no processing of the product takes place and samples are removed for testing of quality and quantity or processed.

Alternatives considered:-

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

(e) The operational aspects of the activity:

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

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

Alternatives considered:-

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

(f) The option of not implementing the activity:

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

Land Use

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

Socio-Economy

The operation will make provision for 5 to 10 job opportunities. This will be lost if the project does not proceed. Substantial tax benefits to the State and Local Government will also be lost.

Biodiversity

The area lies in the Savana Biome (Eastern Kalahari Bushveld) in the Olifantshoek Plains Thornveld (SVk 13), Korrana-Langberg Mountain Bushveld (SVk 15) and the Kathu Bushveld (SVK 12) as described by Mucina and Rutherford (2006).

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

Heritage and Cultural Resources

No information is available on any heritage features on the area of application and the necessary specialist studies will be done to be included into the EIA/EMP documents.

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

ii) Details of the Public Participation Process Followed

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

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

The process as described by NEMA for Environmental Authorisation was followed. See table 5 below 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) will be placed in the Kathu Gazette between the week of 16 April 2021 and 23 April 2021 to notify all other interested and affected parties.

The Scoping Report was put on disc and was distributed to all the registered parties per registered mail on 13 April 2021.

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

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

iii) Summary of issues raised by I&APs

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

Table 5: Summary of issued raised by I&APs

Interested and Affected Parties		Date Comments Received	Issues Raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted					
AFFECTED PARTIES					
Landowner/s	X				
Mr. Pieter T. Sweetnam	X Letter and Scoping Report delivered by hand on 16 April 2021				
Mr. Jacobus L. van der Merwe	X Letter and Scoping Report delivered by hand on 16 April 2021				
Mr. Johannes S. Jordaan	X Letter and Scoping Report delivered by hand on 16 April 2021				
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	X				
Municipal Councillor	X				
Municipality	X				
Ga-segonyana Local Municipality Private Bag X1522 Kuruman 8460	X Registered letter and Scoping Report send on 13 April 2021				

SCOPING REPORT –ALET MARITZ MYNBOU PTY LTD (Gamahuli, Malley and La Rochelle)

John Taolo Gaetsewe District Municipality PO Box 1480 Kuruman 8460	X Registered letter and Scoping Report send on 13 April 2021				
Tsantsabane Local Municipality PO Box 5 Postmasburg 8420	X Registered letter and Scoping Report send on 13 April 2021				
ZF Mgcawu District Municipality Private Bag X 6039 Upington 8800	X Registered letters and Scoping Report send on 13 April 2021				
Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA					
ESKOM Environmental Division P O Box 356 Bloemfontein 9300 Ms A van Gensen	X Registered letter and Scoping Report send on 13 April 2021				
ESKOM Holdings SOC Limited Northern Cape Operating Unit: Land Development PO Box 606 Kimberley 8300	X Registered letter and Scoping Report send on 13 April 2021				
SANRAL PO Box 1389 Bloemfontein	X				

SCOPING REPORT –ALET MARITZ MYNBOU PTY LTD (Gamahuli, Malley and La Rochelle)

9300	Registered letter and Scoping Report send on 13 April 2021				
Transnet Private Bag X19 Bellville 9300	X Registered letter and Scoping Report send on 13 April 2021				
NC Department of Roads and Public Works PO Box 3132 Squirehill Park Kimberley 8300	X Registered letter and Scoping Report send on 13 April 2021				
Department of Public Works P.O. Box 224 Olifantshoek 8450	X Registered letter and Scoping Report send on 13 April 2021				
Communities					
No Communities					
Dept. Land Affairs					
Department of Agriculture, Land Reform and Rural Development P O Box 5018 Kimberley 8300	X Registered letter and Scoping Report send on 13 April 2021				
Department of Rural Development and Land Reform PO Box 5026 Kimberley 8300	X Registered letter and Scoping Report send on 13 April 2021				
Traditional Leaders					

SCOPING REPORT –ALET MARITZ MYNBOU PTY LTD (Gamahuli, Malley and La Rochelle)

No Traditional Leaders					
Dept. Environmental Affairs					
Northern Cape Department of Environment and Nature Conservation Private Bag X6102 Kimberley 8300 Tel: 053 807 7430 Fax: 053 831 3530	X Registered letter and Scoping Report send on 13 April 2021				
Other Competent Authorities affected					
Department of Water and Sanitation Private Bag X6101 Kimberley 8300	X Registered letter and Scoping Report send on 13 April 2021				
SAHRA P.O. Box 4637 Cape Town 8000	X Registered letter and Scoping Report send on 13 April 2021				
National Dept. of Public Works Private Bag X5002 Kimberley 8300	X Registered letter and Scoping Report send on 13 April 2021				
Department of Agriculture, Forestry and Fisheries Directorate: Forestry Management P.O. Box 2782 Upington	X Registered letter and Scoping Report send on 13 April 2021				

**SCOPING REPORT –ALET MARITZ MYNBOU PTY LTD (Gamahuli,
Malley and La Rochelle)**

8800					
OTHER AFFECTED PARTIES					
None					
INTERESTED PARTIES					
None					

iv) 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:

The geology of South Africa is extremely varied and spans a period of about 4 billion years (SACS, 1980). The northeast portion of the country is dominated by the granitic rocks and belts of volcanic and sedimentary rocks forming the Archaean Kaapvaal Craton. Much of the rest of the country is covered by Phanerozoic sediments. All three of the study areas are underlain by the Kalahari Group and therefor only the Khalahari Group will be discussed further. The general sequence of lithological units for the Kalahari Group consist of basal gravels being followed by clay, sandstone, unconsolidated sand and pan sediments and diatomaceous deposits.

Conglomerates and gravels at the base of the Kalahari Group have been recorded throughout the Kalahari Basin. The thickest basal deposits generally seem to be found along the southern edge of the Kalahari Basin in South Africa and in Namibia, where the gravels can reach thicknesses of up to 120m in South Africa.

The composition of the gravels reflects regional source area bedrock characteristics. In the lower Molopo area local Dwyka pebbles are present (Rogers,1936), in Botswana near the Makgadikgadi Basin the clasts are derived from the underlying Karoo Supergroup (du Plessis and Le Roux, 1995), and in the open-pit at Sishen Iron Ore Mine most of the pebbles consist of quartzites from the Olifantshoek Supergroup. The basal gravels observed at Sishen suggest fault controlled scree type deposits or debris flows that underwent some fluvial reworking.

Calcareous clays or marls are present in the southwestern part of the Kalahari Basin. Calcareous clays may be found either overlying the basal gravels, resting directly on the pre-Kalahari surface (Boocock and Van Straten,1962), or even beneath gravel beds (du Toit; 1907,1954). Although impersistent in their distribution, the pink to red clays can reach 65m in thickness, and those from the northern Cape reach 100m (Rogers, 1936; Boocock & van Straten, 1962; Smit,1977). The Kalahari Group clays are generally fine-grained, homogenous and without stratification (du Toit,1954) and while commonly occurring as one bed,

have been noted to inter-digitate with one or more silcrete or calcrete layers in some locations.

Many of the sandstones described in the literature are either calcretised or silcretised, often resulting in them being mistakenly labelled as quartzites. Where calcretisation or silcretisation is absent, the sandstones may be poorly consolidated, and weather easily under the calcretised zones. The sandstones are commonly yellow, but red, brown and green varieties also occur. Unless silcretised or calcretised, the sandstones are poorly consolidated and may display a gradational contact with the underlying clays where they are present.

Duricrusts are one of the most widespread lithologies in the Kalahari, and in much of the Kalahari Basin, other than the unconsolidated sands and pan deposits, duricrusts are the only Kalahari lithologies that can be seen on the surface.

- Ferricrete generally forms when iron oxide is leached from an iron-bearing source, and is then precipitated in the soil or sediment (e.g. du Toit, 1954). In most recorded cases in the Kalahari, the ferricretes take the form of a limonite-cemented gravel.
- Calcretes are the most common duricrust found in the Kalahari Basin, with almost all Kalahari Group sediments having undergone some degree of calcretisation in the past.
- Silcretes have been recorded and described in numerous localities throughout the Kalahari Basin where they have often been described as quartzites or ortho-quartzites. The silcretes in the Kalahari commonly either outcrop on valley sides where they may be associated with calcretes, or occur in pans where green silcrete layers are found interbedded with calcrete.

The unconsolidated sands of the Kalahari Group (Gordonia Formation) cover an area of over 2.5 million km², stretching from the Orange River in the south as far north as the Democratic Republic of Congo, and are thought to form the largest continuous sand body on earth (Baillieu, 1975). Unconsolidated sand deposits are underlain by a large number of lithologies which could weather into sand-sized particles and Kalahari Group and Karoo Supergroup sandstones cover a large percentage of the sub-Kalahari surface.

Most pans are filled by a layer of clayey sand or alkaline calcareous clays (Rogers, 1934; Boocock and van Straten, 1962) and are flanked by lunette dunes. The clays predominantly consist of smectite, illite and sepiolite, but glauconite has also been described at Heuningvlei Pan in the southern Kalahari Basin (Bühmann et al., 1999).

Many pans in the Kalahari are characterised by diatomaceous deposits. Diatomaceous earth, diatomite or Kieselguhr is a white or grey, porous, light-weight, fine-grained sediment that is chalky in appearance, and may be either stratified or massive. It is composed mainly of the fossilised skeletons of diatoms, which are microscopic, unicellular plants forming a class of algae (Kent and Rogers,1947; Pettifer, 1982), as well as spicules of sponges and grass skeletons (Rogers,1936). Each diatom comprises a tiny speck of protoplasm enclosed by a shell (or test) of opaline silica, and when the diatom dies, the insoluble siliceous shell settles on the bottom of the lake (Pettifer, 1982).

The conditions favouring diatom growth are outlined by Strydom (1998):

- low water temperatures of 3°C - 6°C which inhibit bacterial activity thereby preventing acidification due to decomposition, and contain abundant O₂ and CO₂ necessary for diatoms to survive
- slightly alkaline water conditions
- an adequate supply of soluble silica
- small amounts of lime and magnesia which are essential to diatom growth
- low phosphate and nitrate contents which encourage the growth of diatoms over other micro algae

Diatomaceous deposits can occur in many different forms and diatomaceous limestones, diatomaceous shales and mudstones have all been described from the Kalahari Basin. Most diatomaceous deposits found in the Kalahari Basin have fairly high quantities of calcium carbonate, and can be described as calcareous diatomaceous earth or diatomaceous limestones (Kent and Rogers, 1947). The diatomaceous earths are often penetrated by vertical, root-like, sandy, calcareous concretions, thought to have formed by roots which later decayed and either left cavities which remained empty or were filled by sand.

Worldwide, the most significant diatomite deposits were formed in the late Tertiary and Quaternary, and according to Thomas and Shaw (1991a) the proximity of diatomaceous earths to the surface suggest a relatively recent origin, probably during the last glacial. Kent and Rogers (1947) suggest that apart from a few deposits, which are of Recent and sub-Recent age, the diatomaceous earths date back to the so-called “Third Wet Phase” of the Pleistocene period in South Africa.

The geology described in this section was obtained from Haddon (2005). Haddon, I.G. 2005. The Sub-Kalahari Geology and Tectonic Evolution of the Kalahari Basin, Southern Africa. University of Witwatersrand: Johannesburg. (Thesis – PhD).

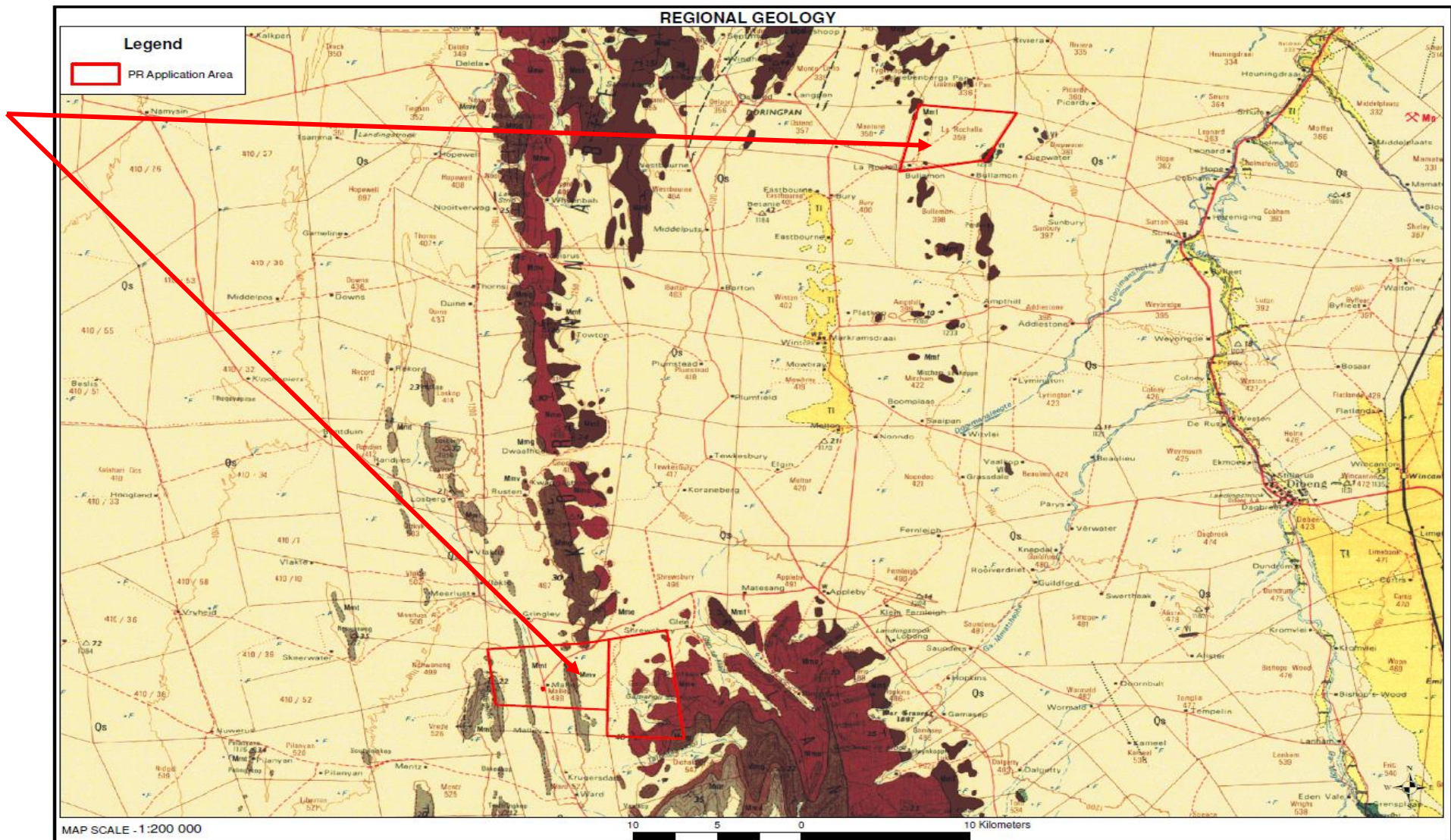


Figure 5. Regional Geological map (Council for Geoscience, Pretoria) showing location of the farms. Pink shading (J) - dolerite dykes and sills; Grey shading (c-Pd) - tillites (Dwyka group of Karoo Supergroup); Green shading (Ra) – lavas; Light yellow shading (Qc) – calcrete; Brown shading (Qs) - Red to flesh-coloured wind blown sand; sand dune ; Pale yellow (Qs) - Quaternary to Recent sands and sandy soil of the Gordonia Formation (Kalahari Group).

(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/>).

(3) TOPOGRAPHY:

The Siyanda District lies on the great African plateau which was uplifted during the great Mesozoic and Tertiary earth movements. This plateau forms the largest part of the ancient continent of Gondwanaland which formally included eastern Brazil, southern India, Western Australia and Antarctica. In each of these fragments the general foundation is the same with an ancient surface of old rocks which together form the “fundamental complex” of the ancient land-mass. Over time this surface was covered by sedimentary beds in a freshwater inland lake and by means of wind blown sand. (taken out of the Siyanda EMF report 2008).

The Gamahuli and Malley study areas are located in the Olifantshoek Plains Thorns and Koranna-Langberg Mountain Buschveld vegetation types whereas the La Rochelle study area is located in the Kathu Buschveld (SVk 12) vegetation type. All three of these vegetation groups are part of the Savana Biome and the Eastern Kalahari Bushveld vegetation unit.

The savanna vegetation of South Africa and Swaziland constitutes the southernmost extension of the most widespread biome in Africa. It extends beyond the tropics to meet the Nama-Karoo Biome on the central plateau, the Grassland Biome at higher altitudes towards the east and extends down the eastern seaboard interior and valleys where it grades into Albany Thicket in the Eastern Cape.

(4) SOILS:

The prospecting area is characterised with aeolian sand, underlain by calcrete of the Kalahari Group, deep, loose, sandy soils of the Namib soil form on the flat plains. Land types mainly Ah and Af with a little Ae. (Mucina & Rutherford, 2006).

(5) LAND CAPABILITY AND LAND USE:

Land use within the broader study area mainly relates to farming activities. Farming practises consist mainly of cattle and game farming and to a lesser extent sheep and goats. Historically some areas have also been ploughed and irrigated, mainly for the cultivation of lucern, ranging in size between 2ha to 16ha on some farms that had high yielding boreholes. Apart from agricultural practices, mining forms the largest industrial activity in the area.

Land Use before Prospecting

Prior to any prospecting activity the land capability correlated directly with the different soil forms. Before any historical mining activity the area would have been suitable for stock grazing.

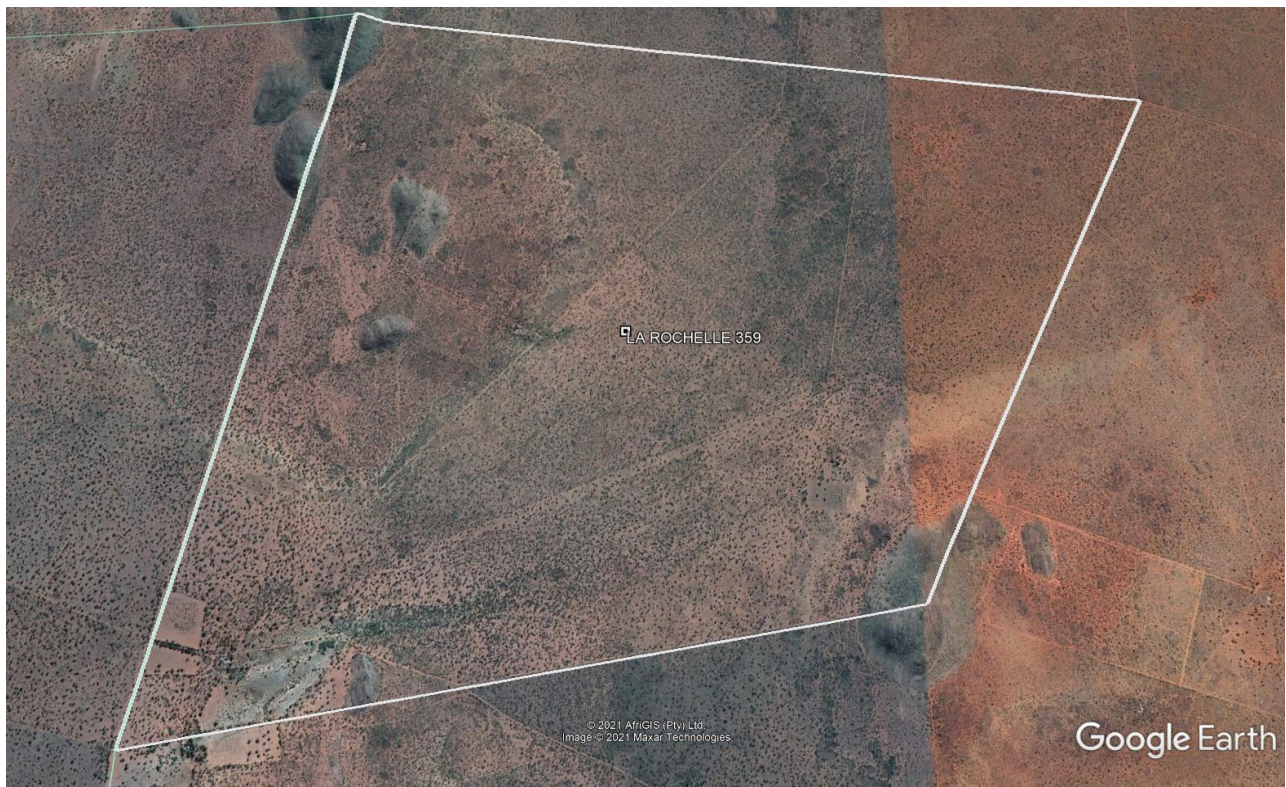


Figure 6. Google earth image of La Rochelle

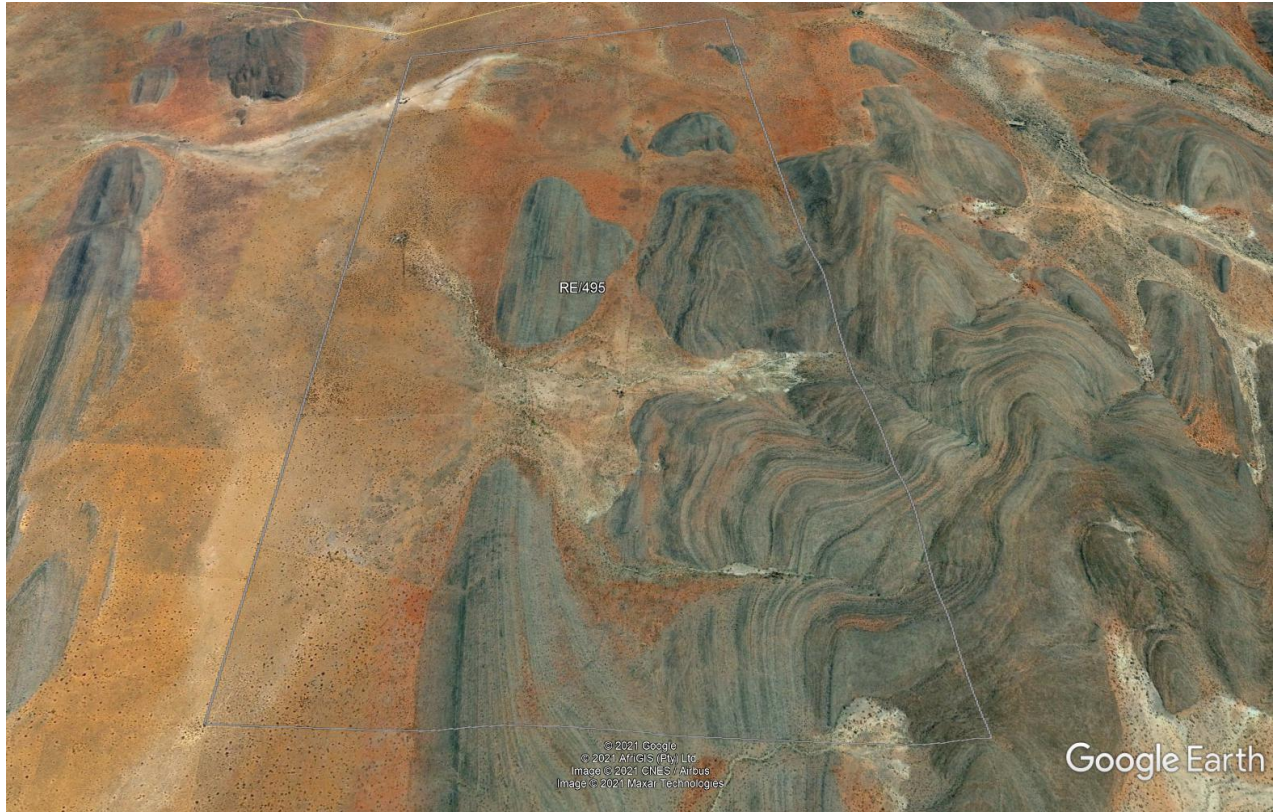


Figure 7. Google earth image of farm Gamahuli 495



Figure 8. Google earth image of farm Malley 498

Evidence of Disturbance

Existing roads

Existing Structures

The prospecting area has a series of access roads and farm steads.

(6) NATURAL FAUNA:

Common species

The prospecting right are located within the distribution range of 49 terrestrial mammals, indicating that the mammalian diversity in the area is of moderate to high potential. Habitat diversity within the area is however fairly low as there are no hills or rocky ridges present.

The following species have been observed in the area: South African Ground Squirrel *Xerus inauris*, Springhare, Aardvark, Damaraland Mole-rat, Cape Porcupine, Cape Fox, Bat-eared Fox, Yellow Mongoose, Slender Mongoose, Suricate, Aardwolf, Steenbok, and Common Duiker as well as a variety of small mammals typical of the area. Four listed terrestrial mammals may occur in the area, the Honey Badger (Endangered), Brown Hyaena (Near Threatened), Southern African Hedgehog (Near Threatened) and the African Pangolin (Vulnerable).

Reptiles

According to the SARCA and the reptile literature, 37 reptile species are known from the area suggesting that the reptile diversity within the site is likely to be moderate to low. Species observed in the area on prior site visits in the vicinity of the site include the Cape Cobra, Ground Agama, Spotted Sand Lizard, Variable Skink, Bibron's Blind Snake, Cape Gecko, Striped Skaapstekker, Boomslang and Spotted Sand Lizard. No species of conservation concern are known to occur in the area. Within the affected area, there are no large rocky outcrops or other specialised reptile habitats.

Amphibians

The prospecting right lie within the distribution range of 6 amphibian species. The nearby Olifantsloop River is the most important feature for amphibians in the immediate area. The Olifantsloop River is however an ephemeral river and holds water only occasionally, as a result, the species prevalent in the area are likely to be those which are relatively independent of water such as the Karoo Toad and Power's Toad. The Giant Bull Frog (Near Threatened) is the only listed species and occupies shallow grassy pans, vleis and other rain-filled depressions in savannas

and grasslands, with its habitat most at risk from transformation. There does not appear to be any breeding habitat for this species in the vicinity of the prospecting right an impact on this species is not likely.

No species is limited to this site only, with most of them being generalist and having a wide distribution range. However, reasonable measure must be put in place to protect endangered and protected species if they are encountered on this site.

The mobility and in many case the adaptability of many bird species has meant that they more than any other vertebrate group have taken advantage of many of the changes we have brought about in the environment.

Overall, the sites indicates a low risk sensitivity in the Screening Report conducted for the Environmental Authorization.

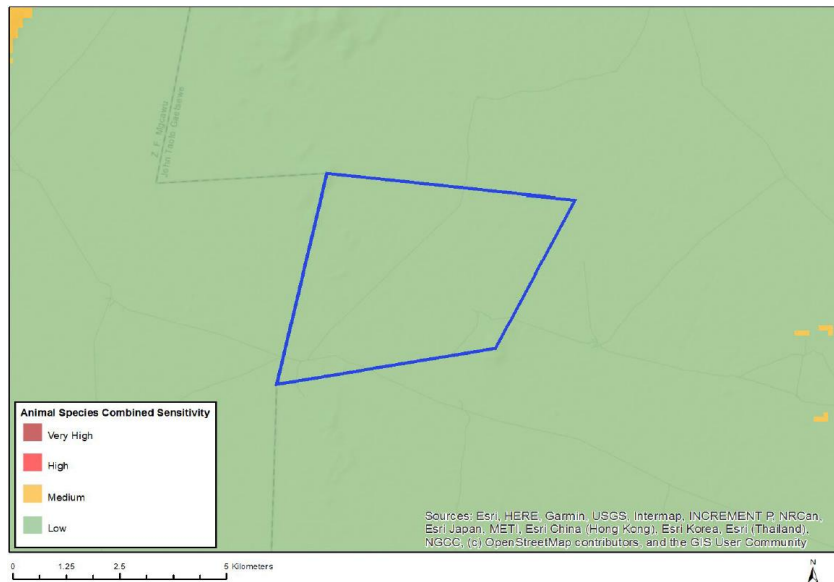
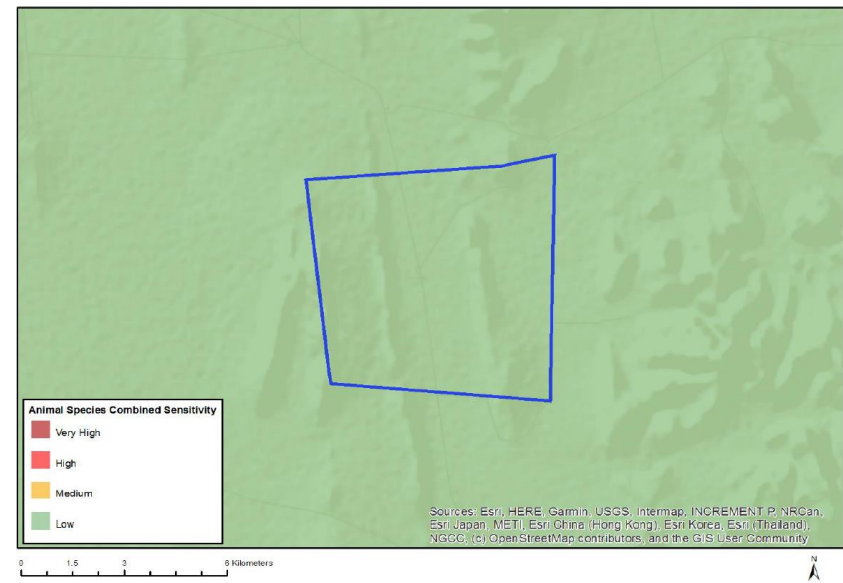
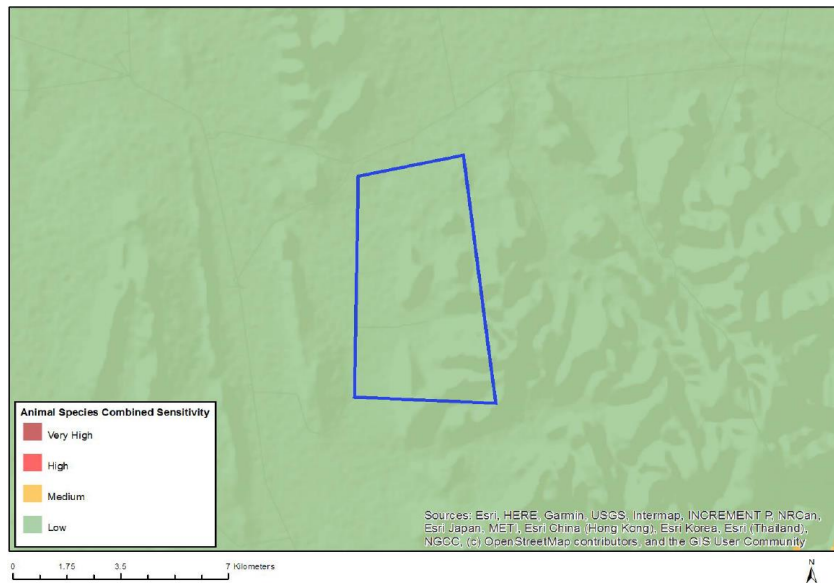


Figure 9. Animal Species Combined Sensitivity for the proposed site.

(7) Flora:

The following information was gathered from the Vegetation of South-Africa, Lesotho and Swaziland written by Mucina and Rutherford (2006).

The Gamahuli and Malley study areas are located in the Olifantshoek Plains Thorns and Koranna-Langberg Mountain Buschveld vegetation types whereas the La Rochelle study area is located in the Kathu Buschveld (SVk 12) vegetation type. All three of these vegetation groups are part of the Savana Biome and the Eastern Kalahari Bushveld vegetation unit.

The savanna vegetation of South Africa and Swaziland constitutes the southernmost extension of the most widespread biome in Africa. It extends beyond the tropics to meet the Nama-Karoo Biome on the central plateau, the Grassland Biome at higher altitudes towards the east and extends down the eastern seaboard interior and valleys where it grades into Albany Thicket in the Eastern Cape.

Olifantshoek Plains Thornveld (SVk 13)

The Olifantshoek Plains Thornveld vegetation group includes the plains of the pediment areas of Korannaberg, Langeberg and Asbestos Mountains as well as those of some ridges to the west of the Langeberg. It stretches from the vicinity of Sonstraal in the north, past Olifantshoek to areas north of Niekerkshoop between Volop and Griekwastad northwards to the flats west of the Lime Acres area in the Northern Cape Province.

Vegetation and landscape features includes a very wide and diverse unit on plains with usually open tree and shrub layers with, for example, *Acacia luederitzii*, *Boscia albirunca* and *Rhus tenuinervis* and with a usually sparse grass layer.

The geology and soils in this vegetation type is characterised by red aeolian sand of Tertiary to Recent age (Kalahari Group) with silcrete and calcrete and some andesitic and basaltic lava of the Griqualand West Supergroup. Hutton soil forms (deeper than 1.2 m) on the overwhelmingly dominant Ae and to a far lesser extent Ah land types.

Important taxa includes the tall tree *Acacia erioloba*. and small trees *Boscia albitrunca* (d), *Acacia mellifera* subsp. *detinens*, *Terminalia sericea*. Tall Shrubs: *Lessertia frutescens*, *Lycium hirsutum*, *Rhigozum obovatum*, *Rhus tridactyla*, *Tarchonanthus camphoratus*. Low Shrubs found in the vegetation type includes *Aptosimum procumbens*, *Grewia retinervis*,

Hoffmannseggia burchellii, *Lycium pilifolium*, *Solanum tomentosum*. Succulent Shrubs such as *Lycium cinereum*, *Talinum caffrum* and Graminoids such as *Schmidtia pappophoroides* (d), *Stipagrostis uniplumis* (d), *Aristida congesta*, *Brachiaria serrata*, *Digitaria eriantha* subsp. *eriantha*, *Melinis repens*. is also found in the vegetation type. Herbs like *Acanthosicyos naudinianus*, *Gisekia pharnacioides*, *Hermannia tomentosa*, *Ipomoea magnusiana*, *Oxygonum delagoense*, *Pollichia campestris*, *Tephrosia purpurea* subsp. *leptostachya*. and the succulent herb *Piarranthus decipiens*. can also be found in the vegetation type. The Olifantshoek Plains Thornveld vegetation type also include the geoxylic suffrutex *Elephantorrhiza elephantina*.

Koranna-Langeberg Mountain Bushveld (SVk 15)

The Koranna-Langberg Mountain Bushveld can be found from the Tswalu Kalahari Reserve at the northern tip of the Korannaberg southwards in the form of multiple ridges to the Langberg and some parallel ridges, to the ridges in the vicinity of Volop as well as some ridges to the west of the Langeberg.

Vegetation and landscape features includes rugged mountains and steep slopes in parts of the Korannaberg but with few cliffs in the Langeberg to the south. Generally supporting open shrubland with moderately open grass cover. *Croton grtissimus* is common in places, becoming particularly diminutiv south of the Langeberg.

The geology of the Korannaberg and Langeberg Mountains consists of quartzite, grywacke and lenses of hematite of the Olifantshoek Supergroup. The soils consists of very rocky, shallow sands.

Important taxa characteristic of the Karonna-Langberg Mountain Bushveld vegetation type includes small trees such as *Acacia mellifera* subsp. *Detinens* (d), *Boscia albitrunca*, *Ficus cordata*, *Maytenus undata*. Tall Shrubs: *Ehretia rigida* subsp. *rigida*, *Euclea undulata*, *Grewia flava*, *Hibiscus micranthus*, *Rhigozum obovatum*, *Rhus burchellii*, *Tarchonanthus camphoratus*, *Tephrosia longipes*. Low Shrubs: *Croton gratissimus* (d), *Artemisia afra*, *Felicia muricata*, *Indigofera polioties*, *Jamesbrittenia albiflora*, *Leucas capensis*, *Lophiocarpus polystachyus*, *Melhania prostrata*, *Nolletia arenosa*, *Pegolettia retrofracta*, *Psiadia punctulata*. Succulent Shrubs: *Aloe hereroensis* var. *hereroensis*, *Euphorbia avasmontana*, *E. rectirama*. Semiparasitic Shrub: *Thesium hystrix*. Woody Climber: *Putterlickia pyracantha*. Woody Succulent Climber: *Sarcostemma viminale* (d). Graminoids: *Aristida diffusa* (d), *Eragrostis curvula* (d), *Brachiaria nigropedata*, *Cenchrus ciliaris*, *Digitaria eriantha* subsp. *eriantha*, *Heteropogon contortus*, *Stipagrostis*

uniplumis. Herb: *Ceratotheca triloba*. Geophytic Herbs: *Boophone disticha*, *Cheilanthes hirta*, *Pellaea calomelanos*, *Sansevieria aethiopica*.

Kathu Bushveld (SVk 12)

The Kathu Bushveld vegetation group can be found in the Northern Cape Province in the plains from Kathu and Dibeng (in the south), through Hotazel to the Botswana border.

The vegetation type is characterised by a shrub layer, medium-tall tree layer and variable grass layer. The most prominent tree in this vegetation type is the *Boscia albitrunca*. Shrub species that dominate includes *A. mellifera*, *Diospyros lycioides* and *Lycium hirsutum*.

Aeolian red sand and surface calcrete, deep sandy soils of Hutton and Clovelly soil form are the most prominent geology and soil forms for this vegetation group.

Important taxa of the vegetation group includes the tall tree *Acacia erioloba* (d) as well as small trees like *Acacia mellifera subsp. detinens* (d), *Boscia albitrunca* (d), *Terminalia sericea*. Tall shrubs included in the vegetation group includes *Diospyros lycioides subsp. lycioides* (d), *Dichrostachys cinerea*, *Grewia flava*, *Gymnosporia buxifolia*, *Rhigozum brevispinosum*. *Aptosimum decumbens*, *Grewia retinervis*, *Nolletia arenosa*, *Sida cordifolia*, *Tragia dioica*. are alle examples of low shrubs that form part of the Kathu Bushveld vegetation group. Graminoids that forms part of the vegetation type includes *Aristida meridionalis* (d), *Brachiaria nigropedata* (d), *Centropodia glauca* (d), *Eragrostis lehmanniana* (d), *Schmidtia pappophoroides* (d), *Stipagrostis ciliata* (d), *Aristida congesta*, *Eragrostis biflora*, *E. chloromelas*, *E. heteromera*, *E. pallens*, *Melinis repens*, *Schmidtia kalahariensis*, *Stipagrostis uniplumis*, *Tragus berteronianus*. Herbs found in the Kathu Bushveld vegetation type are *Acrotome inflata*, *Erlangea misera*, *Gisekia africana*, *Heliotropium ciliatum*, *Hermbsaedia fleckii*, *H. odorata*, *Limeum fenestratum*, *L. viscosum*, *Lotononis platycarpa*, *Senna italica subsp. arachoides*, *Tribulus terrestris*.

The Screening Report composed for the Rosville prodject indicated a low risk sensitivity for the Plant Specie Theme of the Environmental Screening Report.

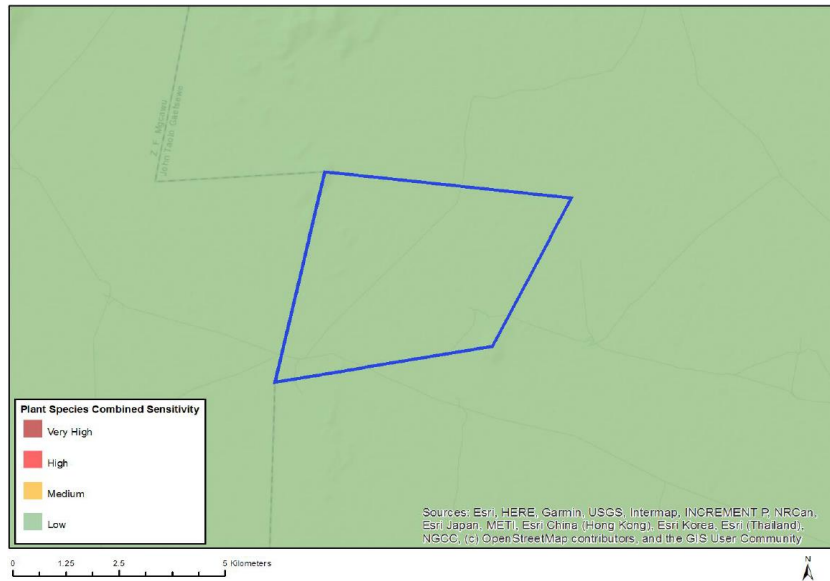
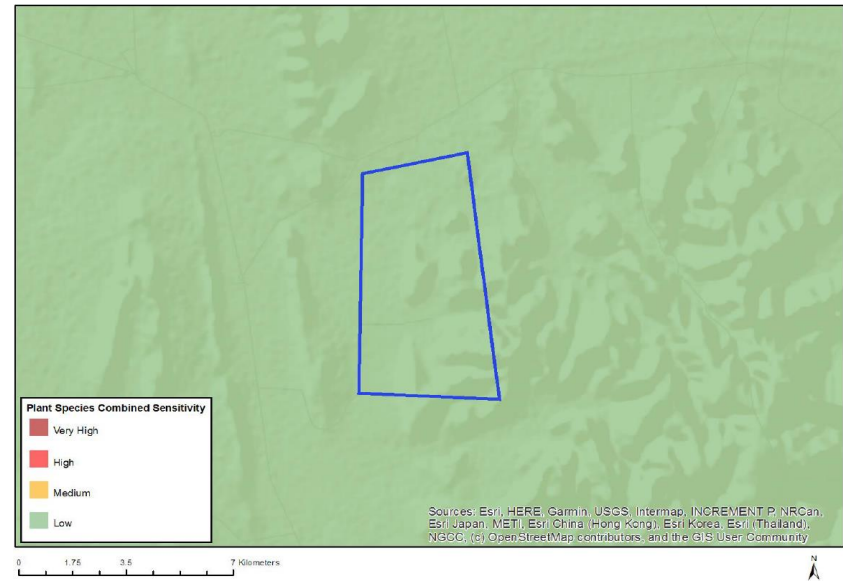
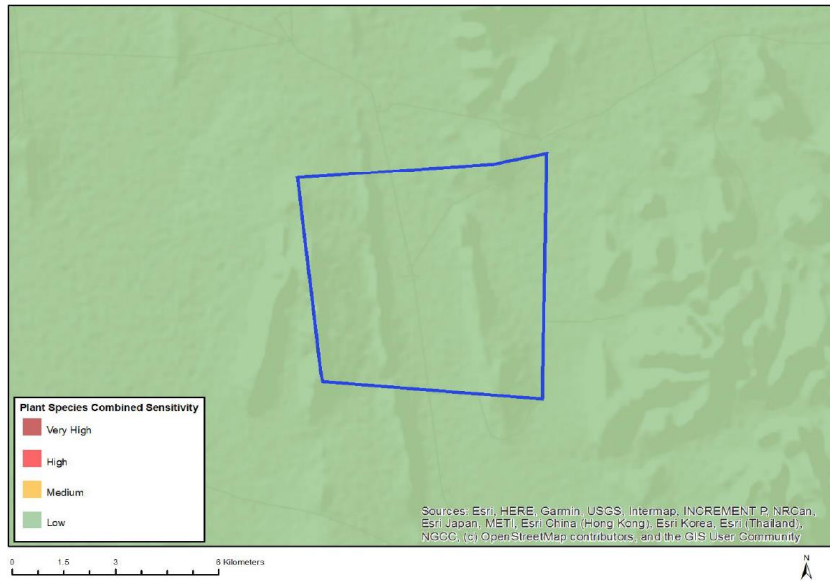


Figure 10. Plant Species Combined Sensitivity for the proposed sites.

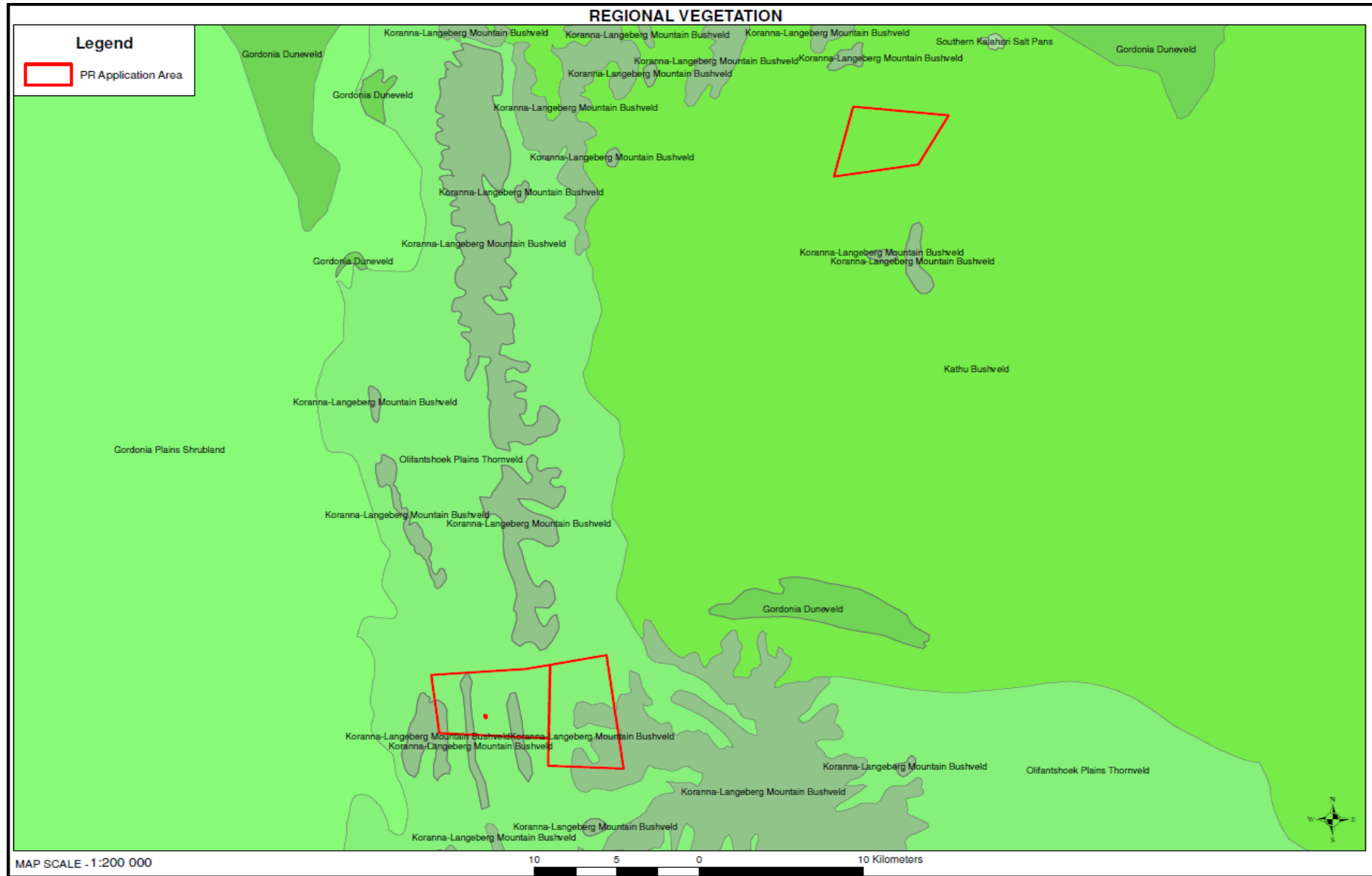


Figure 11. Regional Vegetation Map, the application area is indicated in red.

(8) SURFACE WATER

The nearest perennial surface water source is the Orange river located approximately 115 km south west of the Gamahuli and Malley sites and approximately 155 km south west from the La Rochelle sites.

The proposed site is situated in the D41K and D42C Quattranary catchment area which forms part of the Lower Orange Water Management Area (LOWMA).

The LOWMA's natural environment is generally characterised by its arid climate with minimal rainfall and drought conditions, with occasional severe flooding. The evaporation (including evapotranspiration) is as high as 3000mm per annum, which is generally more than the Mean Annual Rainfall (MAR). As a result, little usable surface runoff is generated over most of the area as a result of the extremely low and infrequent rainfall. (Taken out of the Siyanda EMF Report 2008).

Occasional run-off occurs in the upper reaches of the Molopo River. There are, however, no records of volumes for occasional run-off reaching the Orange River. Last recordings of flows in the lower reaches of the Molopo and Kuraman Rivers were in 1933 and again in the 1974/5 and 1975/6 season. The total volumes of the Mean Annual Runoff (MAR) and Ecological Reserve (EC) are determined to be 181 million cubic metres and 49 million cubic metres, respectively. (Taken out of the Siyanda EMF Report 2008).

Furthermore, there is a non-perennial drainage line on the proposed prospecting sites Gamahuli and Malley which only contains water during heavy rainfall events.

Classification of the Watercourse

Wetlands

In terms of Aquatic Biodiversity Sensitivity the screening report done for the Environmental Authorization indicates that the theme has a low risk sensitivity for the majority of the sites. The La Rochelle farm indicates a small area of high sensitivity in the south western part of the property.

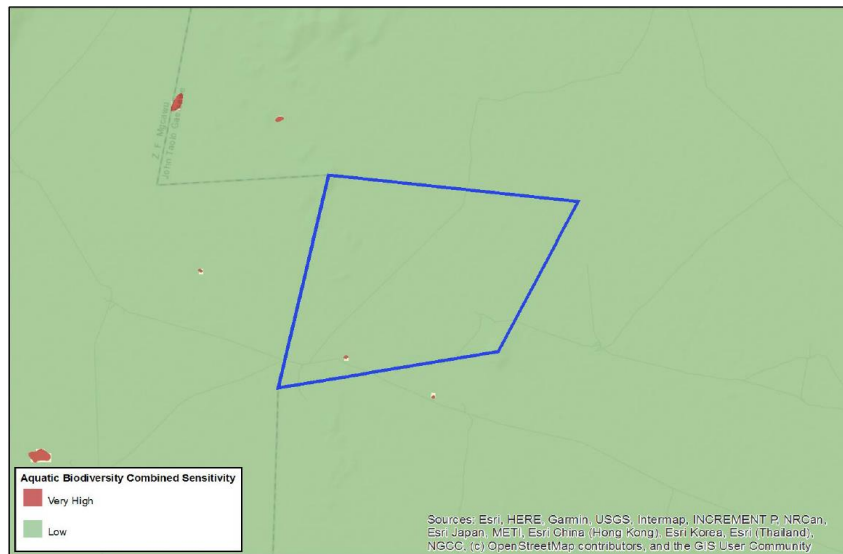
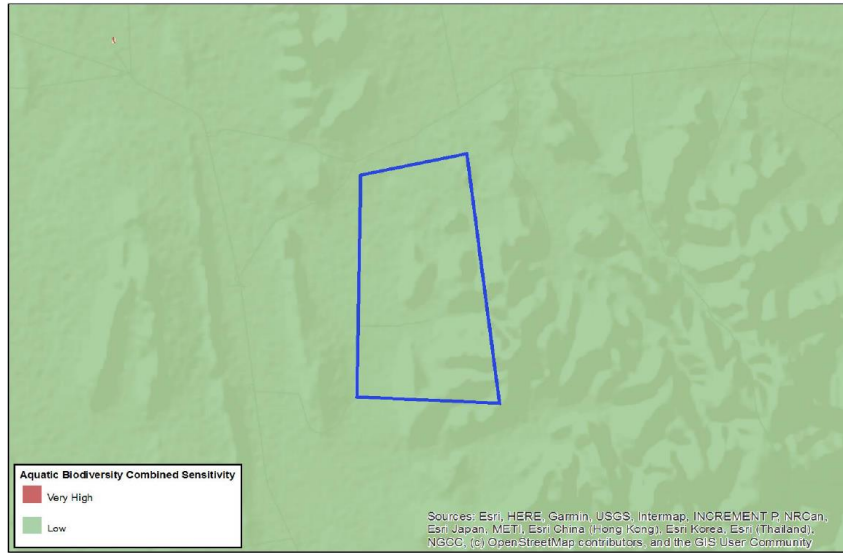


Figure 12. Aquatic Biodiversity Combined Sensitivity for the proposed site.

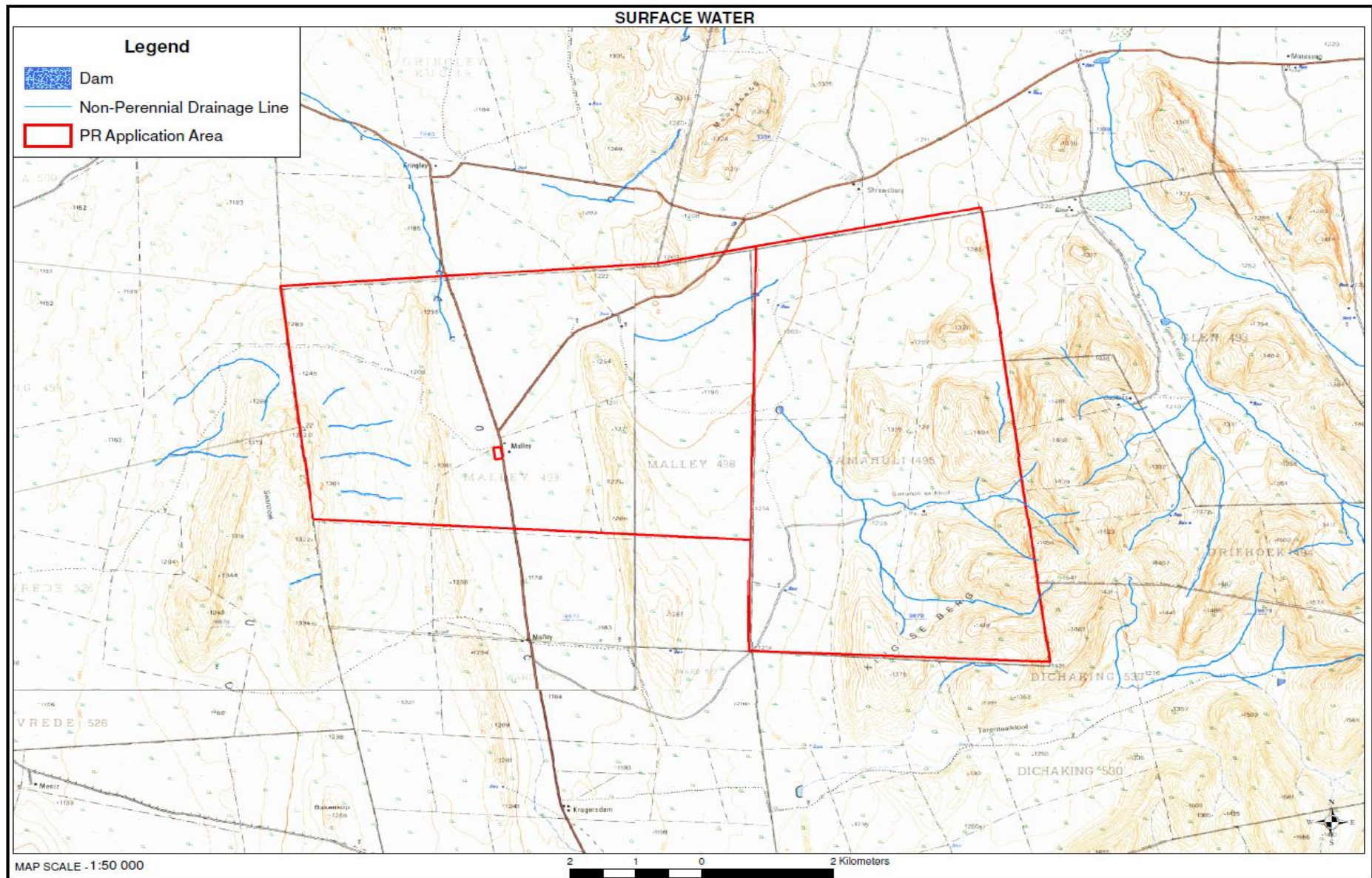


Figure 13. Surface Water map for the farms Gamahuli and Malley (indicated in red)

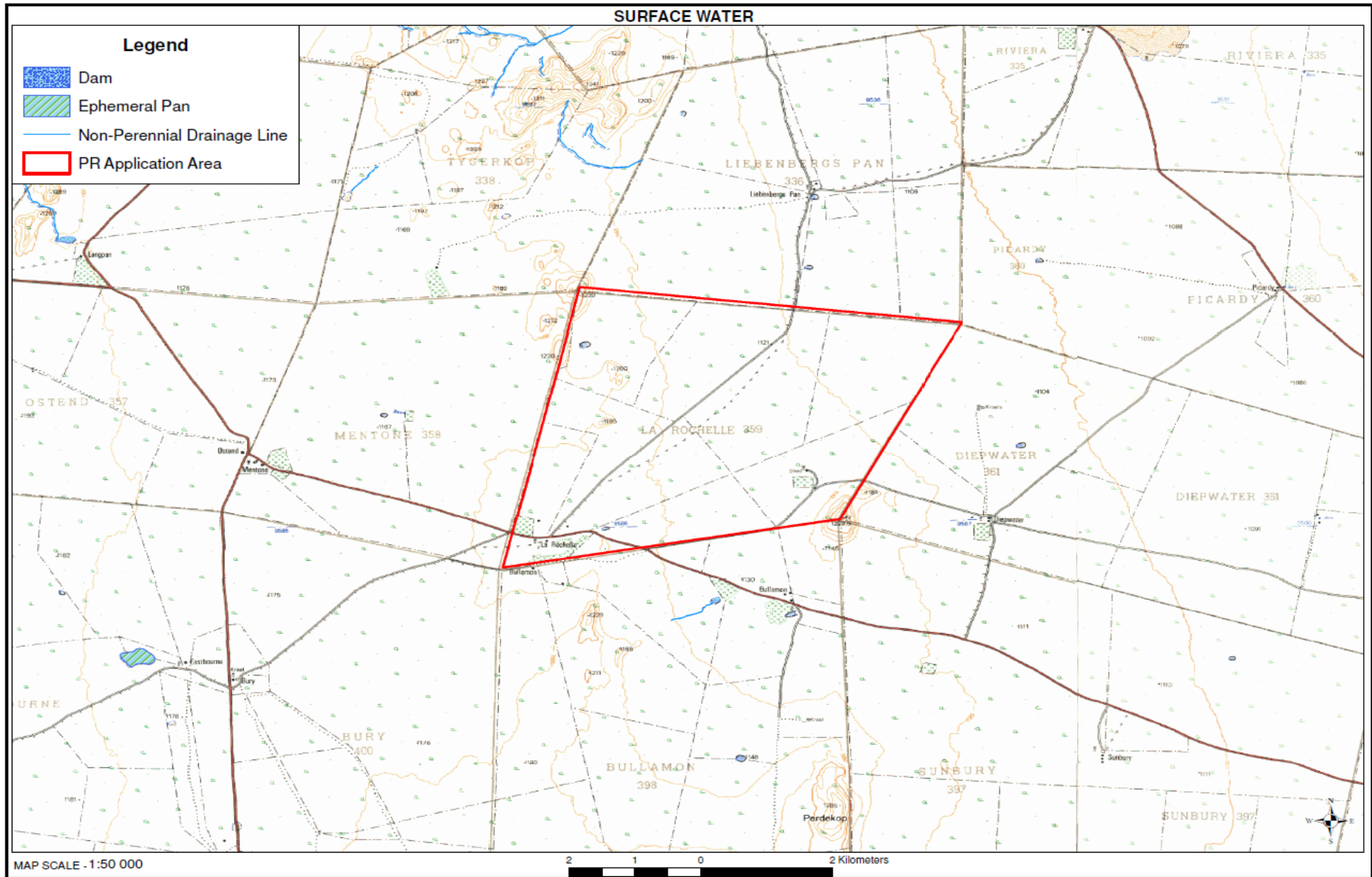


Figure 14. Surface Water map for the farm La Rochelle (indicated in red).

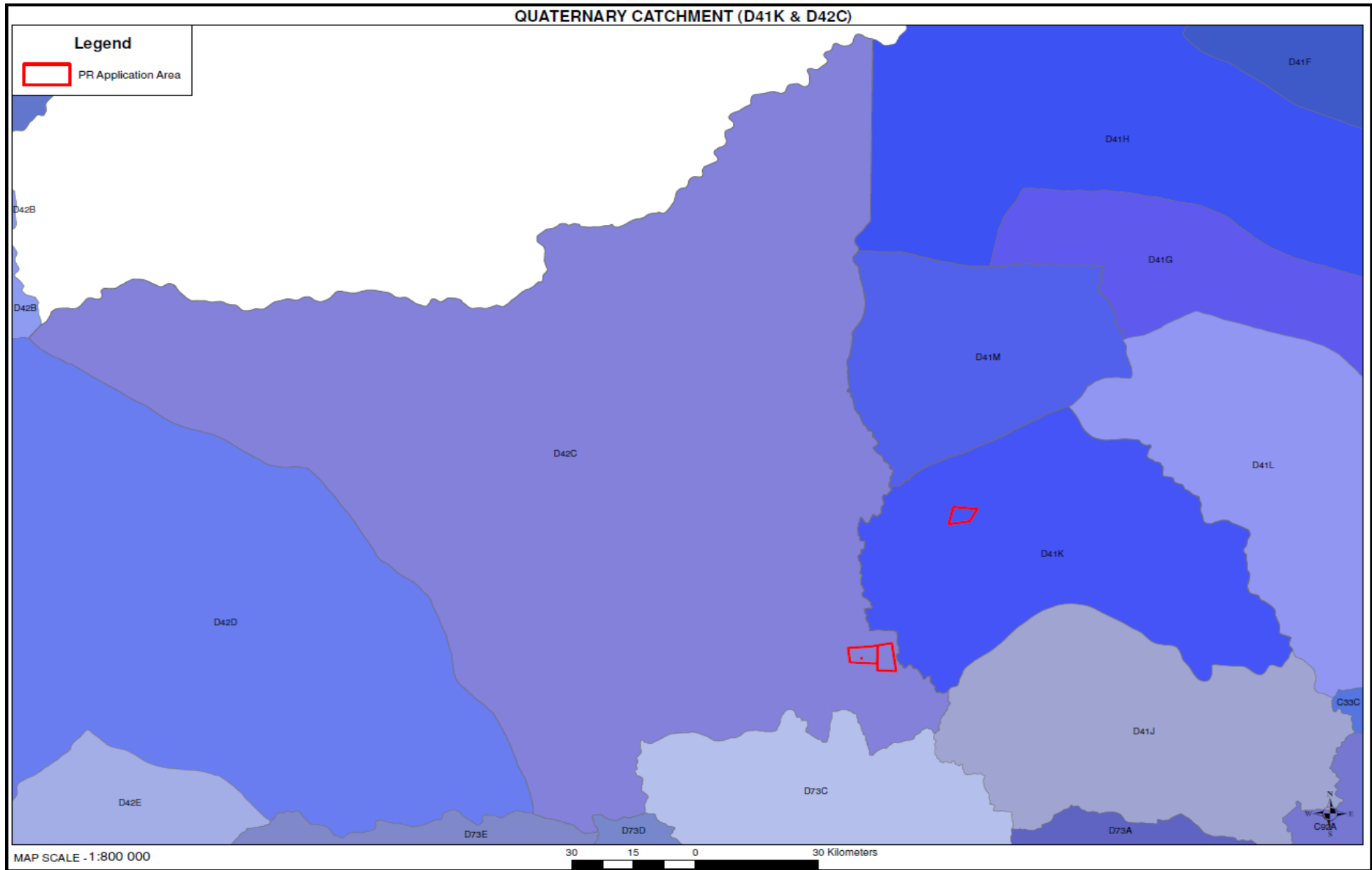


Figure 15. Catchment area

(9) GROUND WATER:

Depth of water-table(s):

Ground-water zone:

The kieselguhr bulk sampling does not affect the quality of the ground water in any manner. No water is used in the process and therefore no harmful or toxic properties are encountered in the Kieselgurh deposits.

(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

Existing Sources

Farming activity, especially ploughing of the irrigation fields, may generate dust during certain periods of the year. Furthermore, dust produced by vehicles moving on gravel roads can reduce the air quality. The general air quality on the area is expected to be good.

New source

The source of air pollution on the farm will be nuisance dust generated by the bulk sampling Prospecting process, the loading of kieselguhr onto the transport trucks, 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-west for the months January to September and changing from north to sometimes westerly winds during October to December, there is a limited 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 to dampen dust.

The dust is controlled by watering down the roadway used by these trucks while bulk sampling.

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 equipment used for bulk sampling (tip trucks, front-end loader, back actor). The DIBENG ROAD NEXT TO LA ROCHELLE which goes past the proposed site also contributes to the noise in the area.

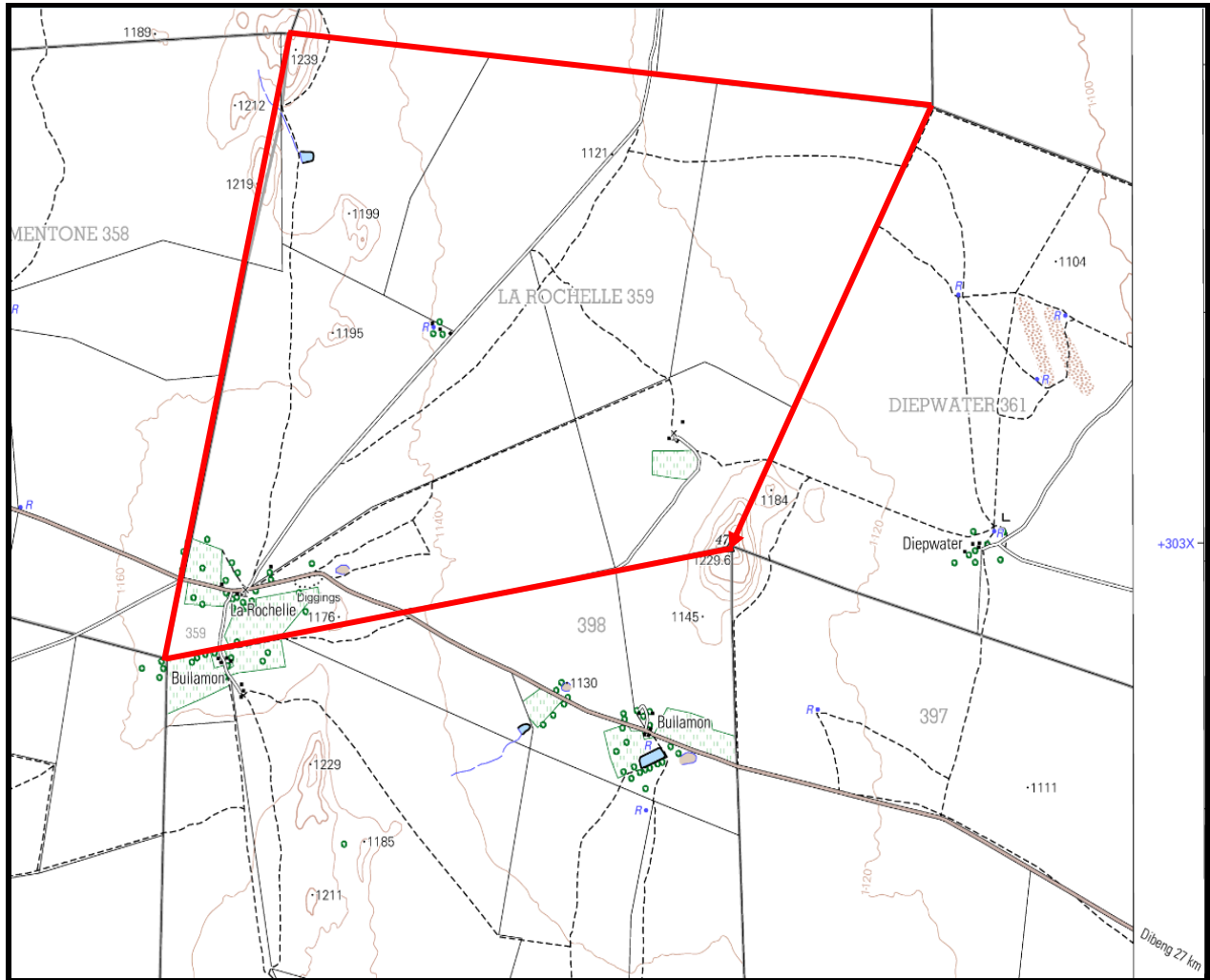


Figure 16. 1:50 000 Map of the farm La Rochelle 359 with roads indicated.

The Appleby and Olifantshoek through Malley 498.

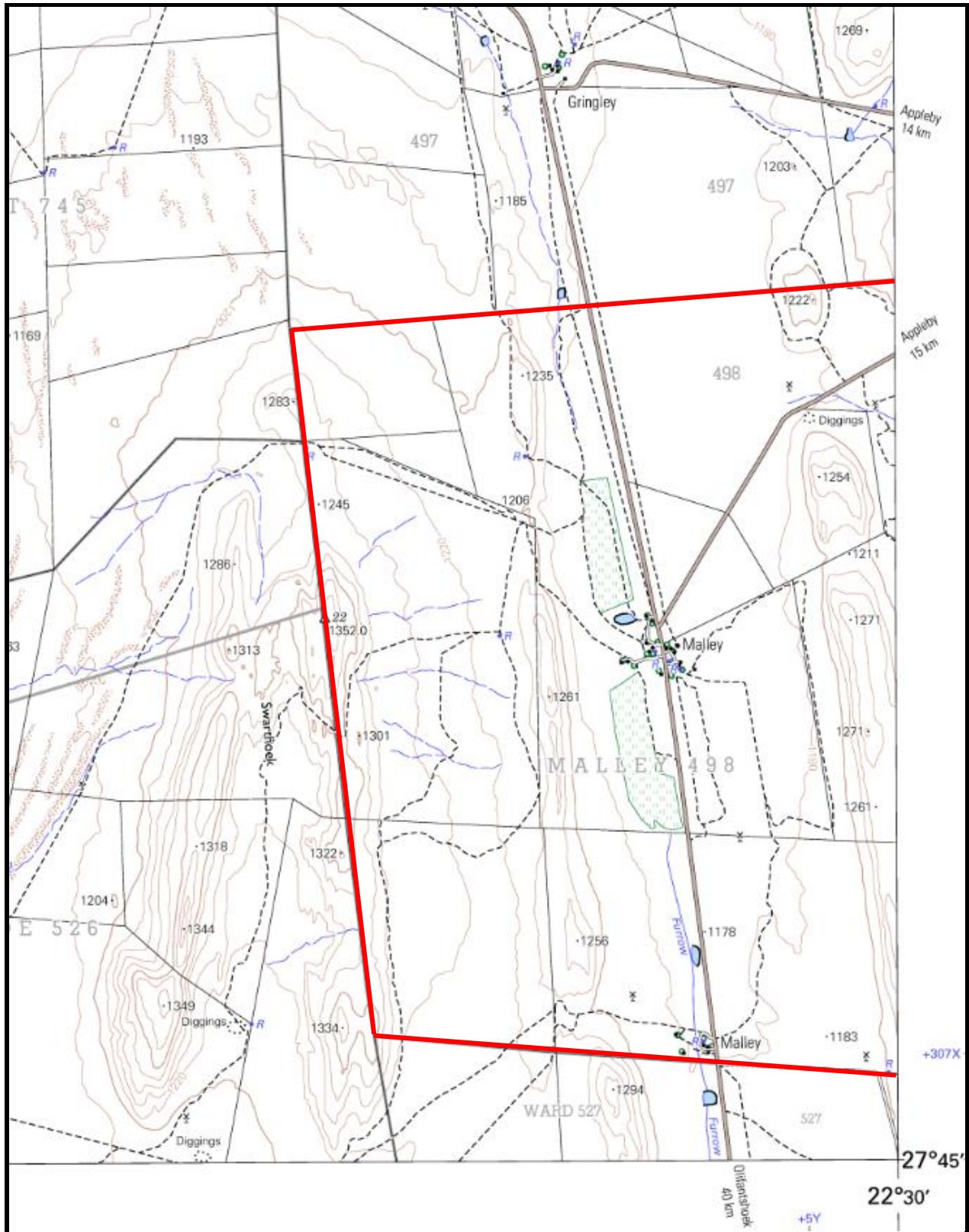


Figure 17. 1:50 000 Map of Malley with roads indicated.

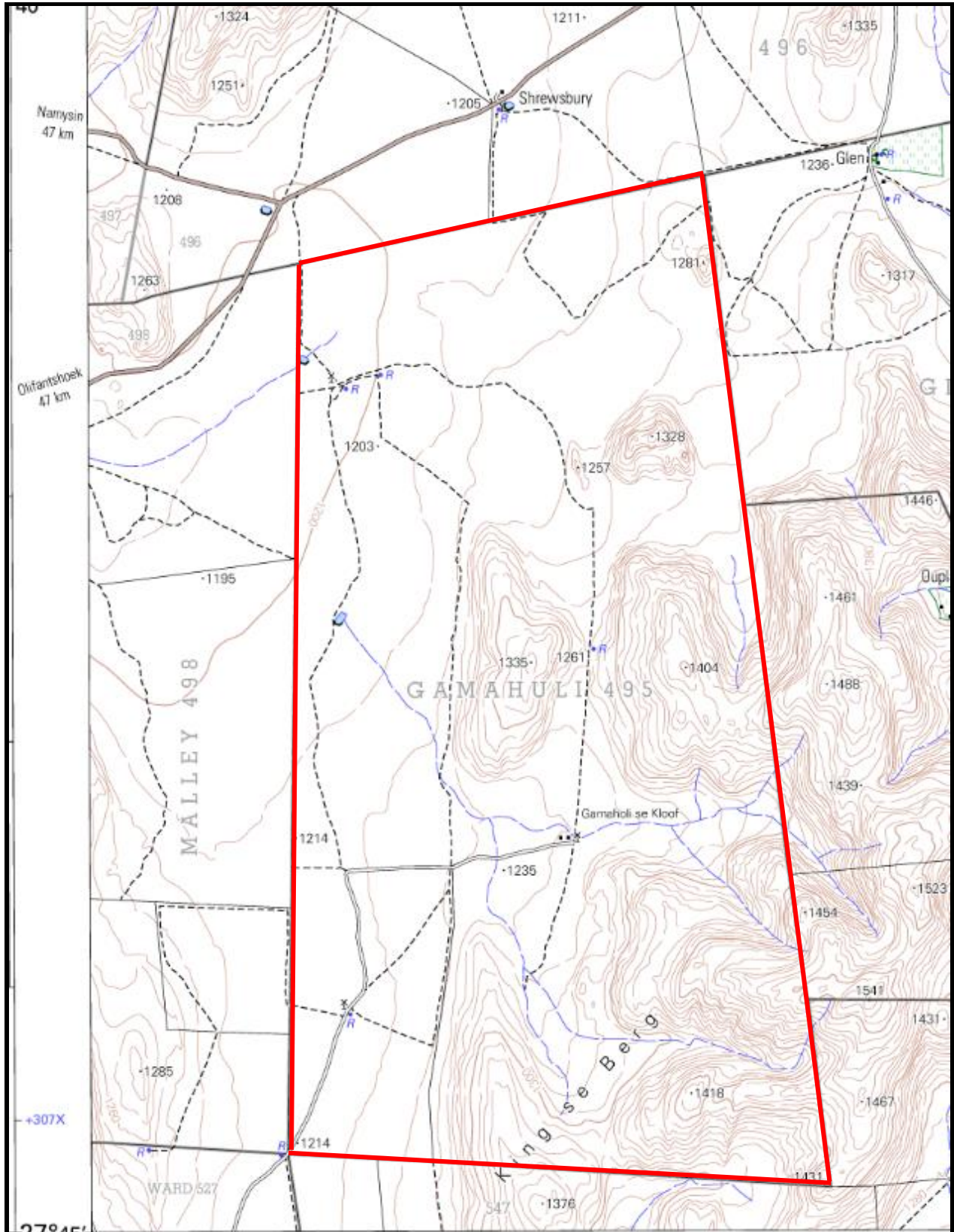


Figure 18. 1:50 000 Map of the farm Gamahuli 495 with roads indicated.

The Olifantshoek and Namysin road next to Gamahuli 495 with various small farm roads.

There are farming operations on both sides of the proposed prospecting operation. Although these operations do generate noise the overall impact can be described as negligible.

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 bulk sampling site. Bulk sampling noise and mine vehicles are limited between 7am and 5pm every day during the week and occasionally 24 hours. 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:

The prospecting site would possibly be visible from the gravel roads. There is however no method of reducing the impact during bulk sampling operations (operational phase), it can only be mitigation by doing concurrent rehabilitation of open pits as prospecting progress.

(12) AREAS OF CULTURAL-HISTORICAL OR ARCHAEOLOGICAL INTEREST

It is not certain if any areas of cultural-historical value is present on the prospecting right area. No heritage resources such as built structures or sites of cultural significance associated with oral histories, burial grounds and graves of victims of conflict, and cultural landscapes or views capes are known to be present on the proposed prospecting operation. However, the Screening Reports of the three study areas indicate medium and high sensitivities for the Paleontological Theme and medium risk sensitivity for the Archeological and Cultural Heritage Theme.

An archaeologist will be contacted to do a heritage survey and this will be submitted as soon as it has been received with the EIA EMP documents as well as a desktop palaeontological study.

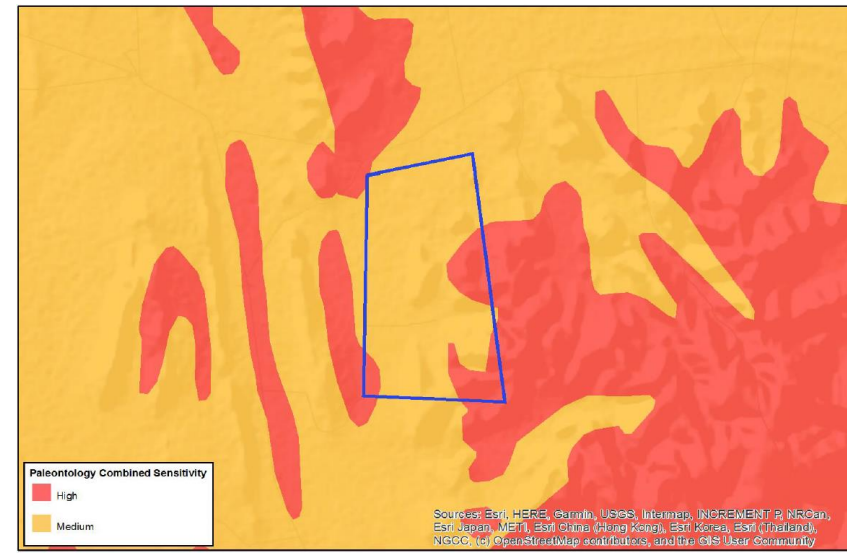
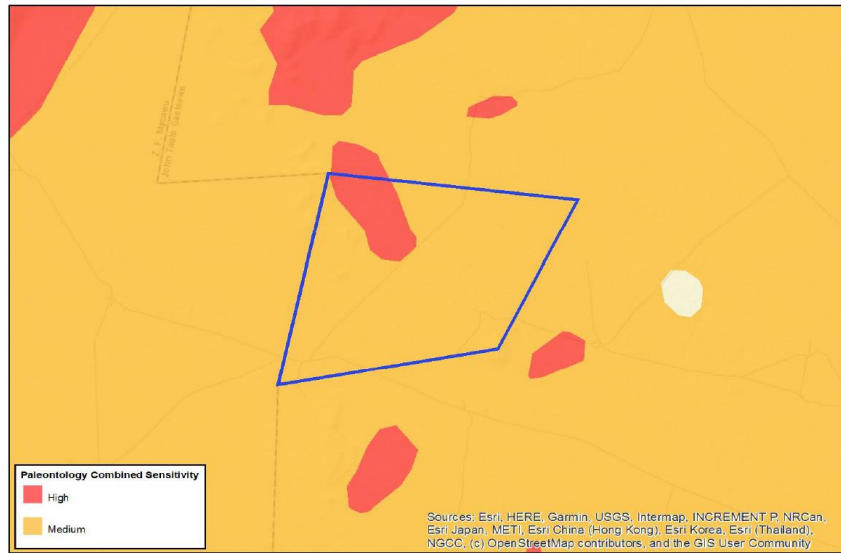


Figure 19. Paleontological Combined Sensitivity for the proposed sites.

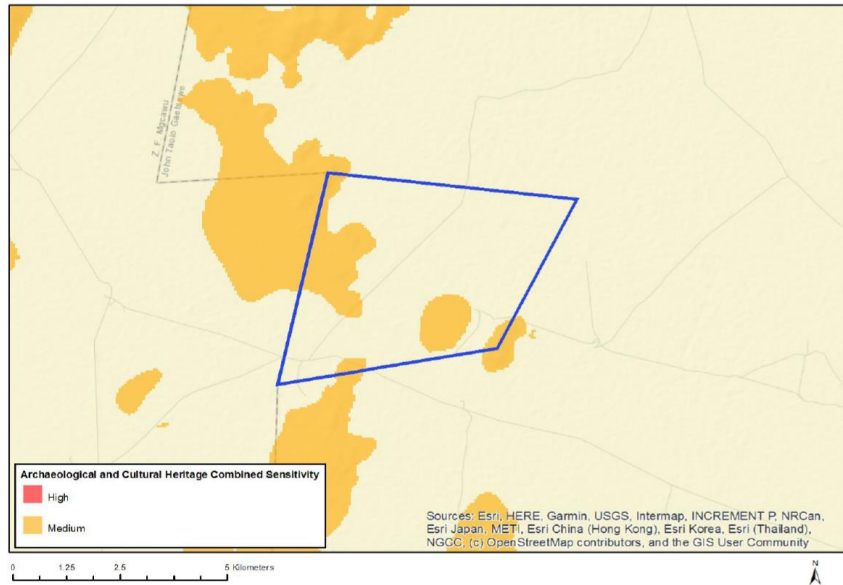
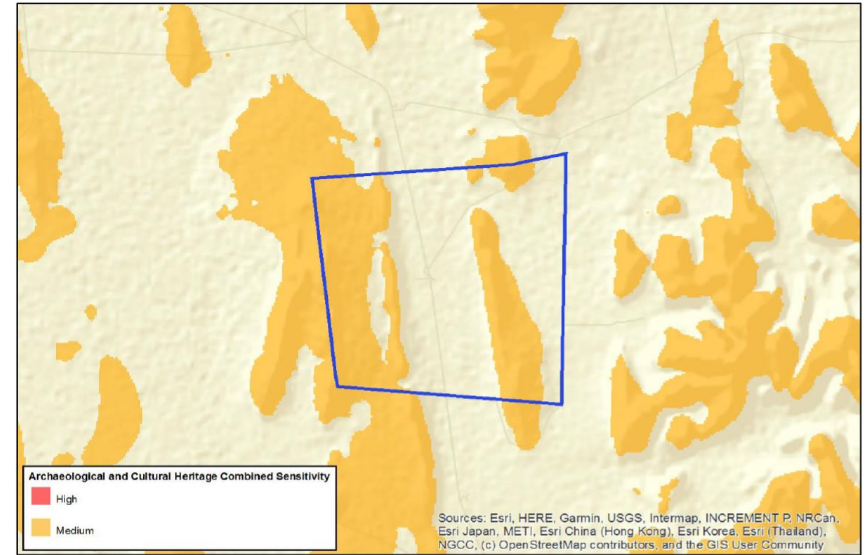
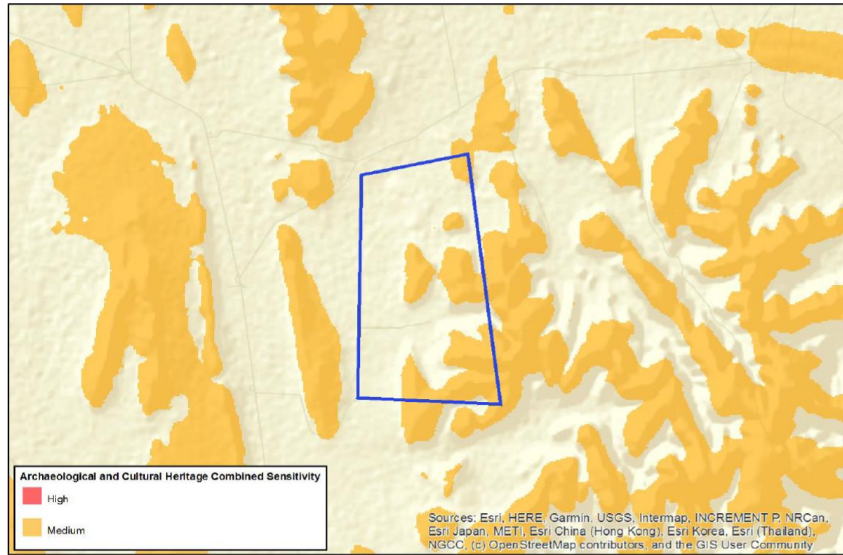


Figure 20. Archeological and Cultural Heritage Combined Sensitivity for the proposed sites.

(13) TOPOGRAPHY, SOIL EROSION AND ASSOCIATED DEGRADATION OF ECOSYSTEMS:

The only potential sensitive feature is the natural drainage channels within the possible Prospecting area. The bulk sampling activities will not go into any drainage channel it is thus not foreseen that prospecting can have a possible influence on this water features.

(14) BROAD-SCALE ECOLOGICAL PROCESSES:

Transformation of intact habitat on a cumulative basis could contribute to the fragmentation of the landscape and could potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations.

The site however, indicates a low risk sensitivity for the Terrestrial Biodiversity Theme for the majority of the farms Malley and La Rochelle in the Environmental Screening Report. Both these properties however also have areas which indicates high risk sensitivities. The Gamahuli farm has a majority high risk sensitivity with low risk sensitivities on the northern as western parts of the farm.

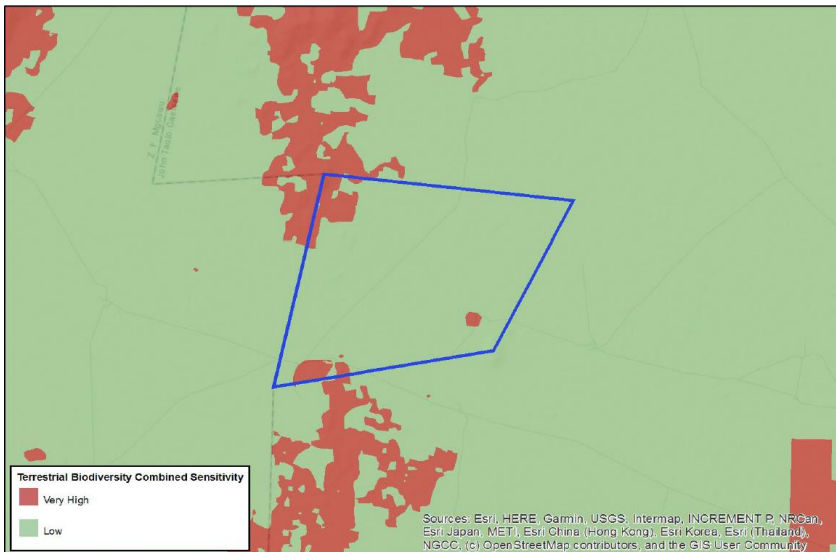
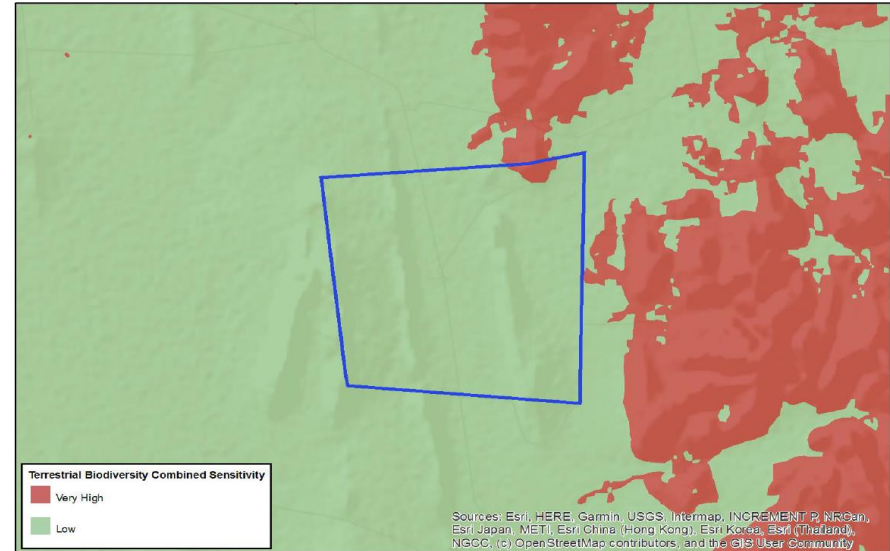
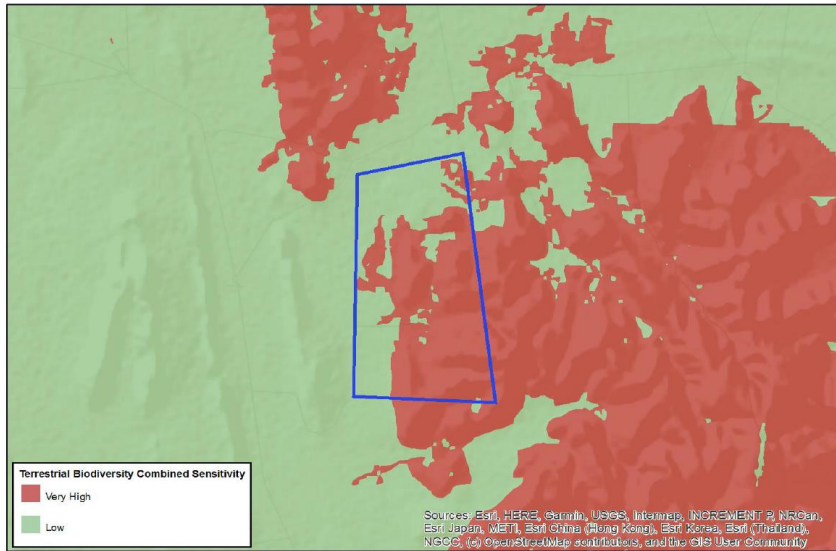


Figure 21. Terrestrial Biodiversity Combined Sensitivity.

(15) 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 887km². The municipal area falls in the Gamagara Corridor. The NCPSTDF (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 Mothibstad Municipalities that includes sections of the Bophirima District Municipality.

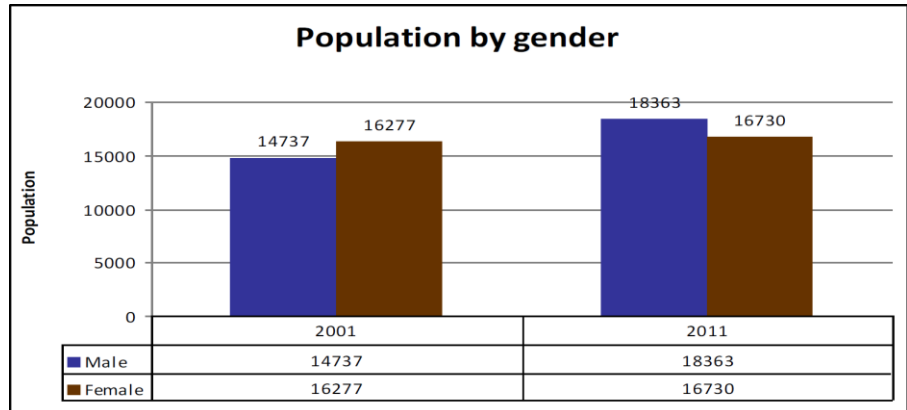
Kuruman is the main town of the area and is known as the "Oasis of the Kalahari". The town has a permanent source of water. Kuruman is situated 1 340 metres above sea level on the Ghaap Plateau. Kuruman is situated on the Namaquari route, forming part of the main route between Gauteng and Namibia and 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 Municipality 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 6). 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 6: 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 7 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 7: 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

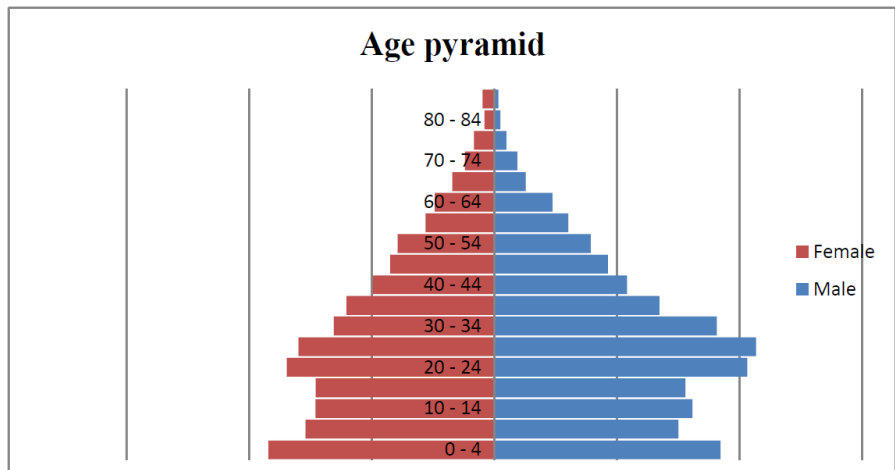
The population of Ga-Segonyana can also be described in terms of population groups as seen in table 8 below. There was an increase in the Black African, Coloured, and Indian/Asian population groups from 1996 to 2016, whilst the White population shows a marginal decrease over the same period. There is 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 8: 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

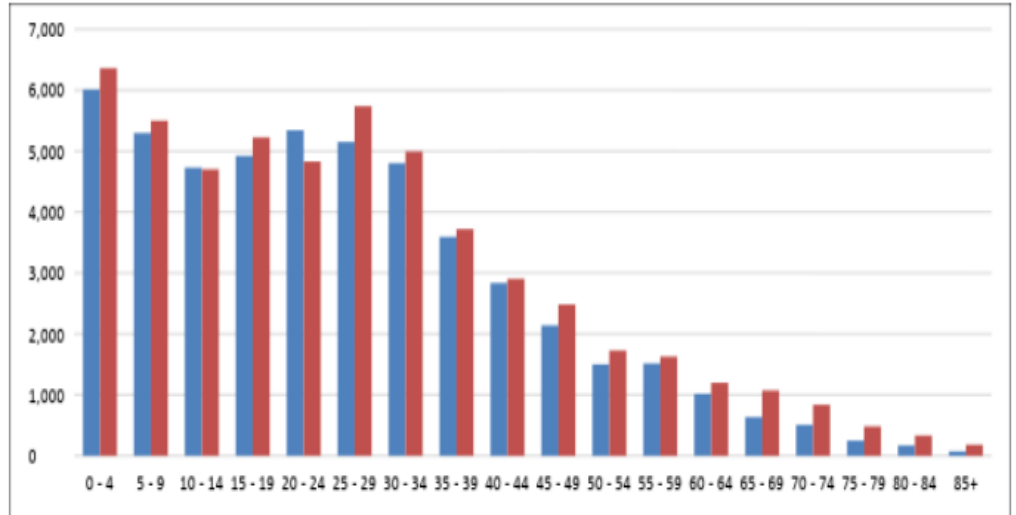
The age pyramid (Graph 2) indicates that the population of Tsantsabane is predominantly young people. There is a small percentage of people older than 60 years. The age pyramid further indicates that approximately 31% of the population is under 14 years and approximately 33% is between 15 and 34 years.



Graph 2: Age pyramid for the Tsantsabane Municipality.

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 9).

Table 9: 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

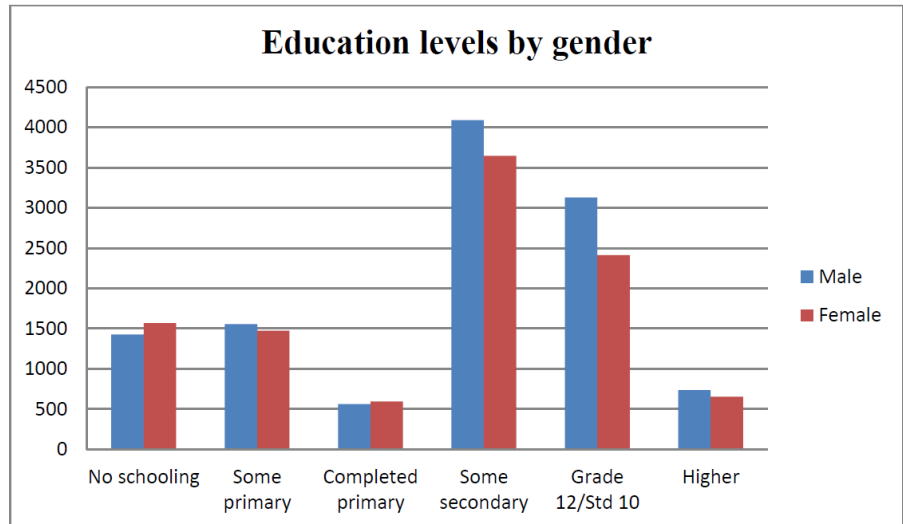
Education Levels

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 10 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.

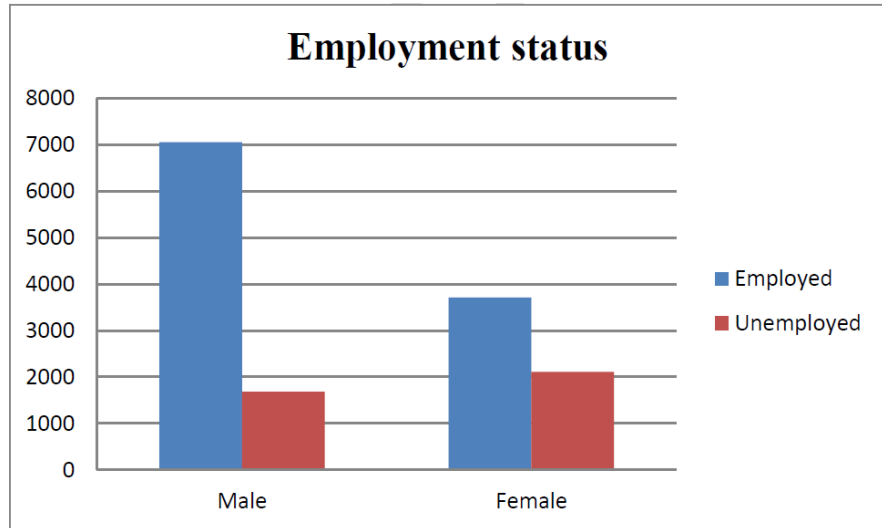
The White population is far more educated than the other population groups in the Ga-Segonyana municipality, where about 27.4% of Whites have a tertiary education, followed by 6.4% for Coloureds, and 4.9% for Black Africans.

Table 10: 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

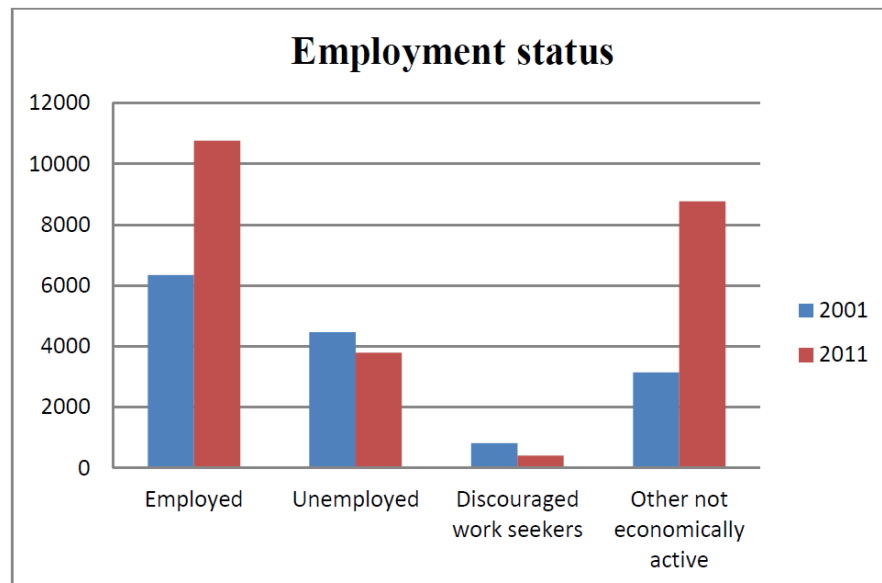
Employment

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.



Graph 5: Employment status indicated by gender for Tsantsabane.

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.



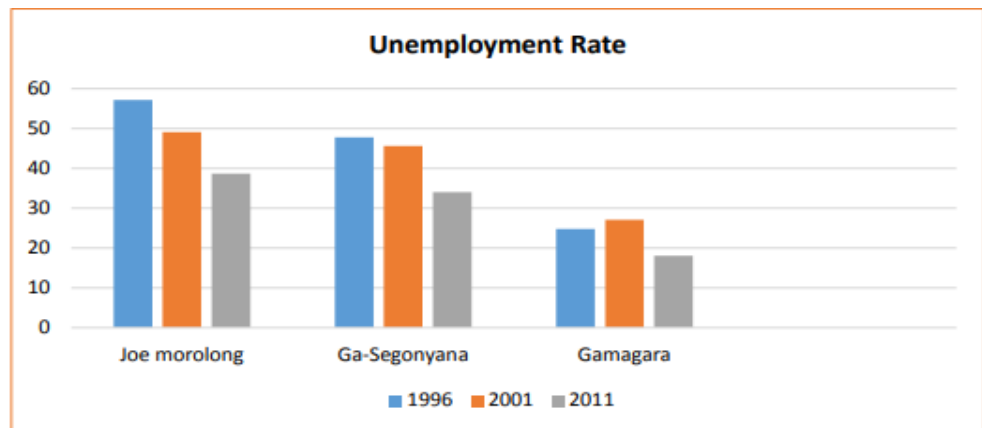
Graph 6: Employment Status for the Tsantsabane Municipality.

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 11: 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]

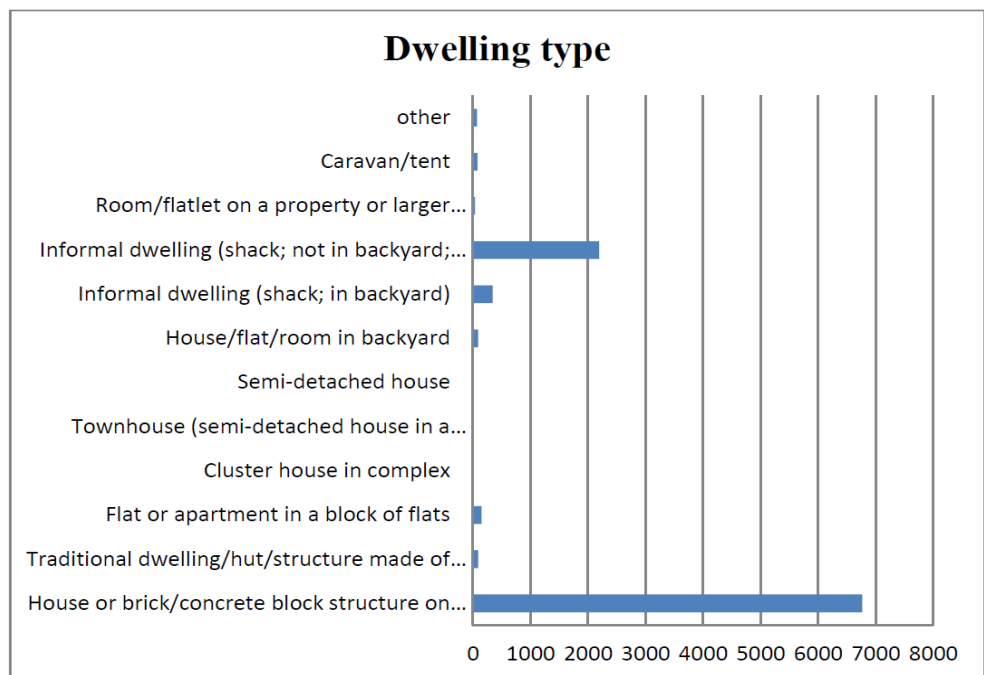
Housing

“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 12. Those who are staying in informal dwellings

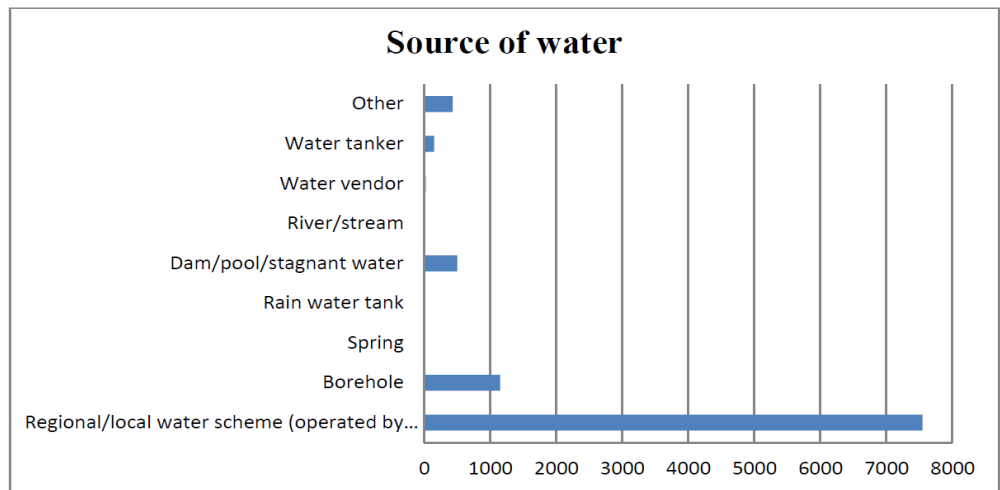
decreased significantly from 18.6% in 1996 to 4.6% in 2016. Just less than 10.0% of the population stays in traditional dwellings.

Table 12: 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.

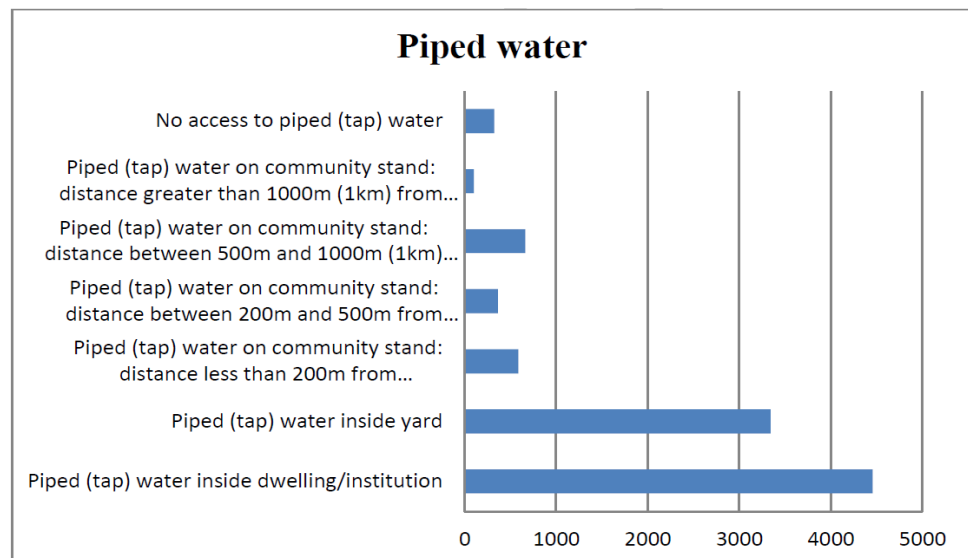
The Kuruman Eye, a spring that delivers 20 million litres of water per day, is the main source of water in the district. In total, there are five “eyes” or fountains in the JTGDM. Two of these are associated with the Kuruman Eye, while two (the Klein Koning and Groot Koning eyes) are located south of 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 13: 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 14).

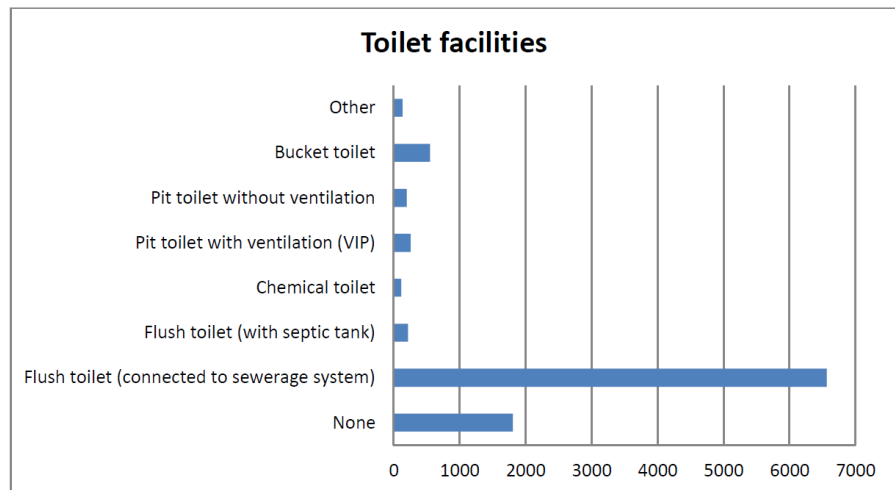
Table 14: Access to drinking water within JTGDM [Source: StatsSA 2016]

	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 15: 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

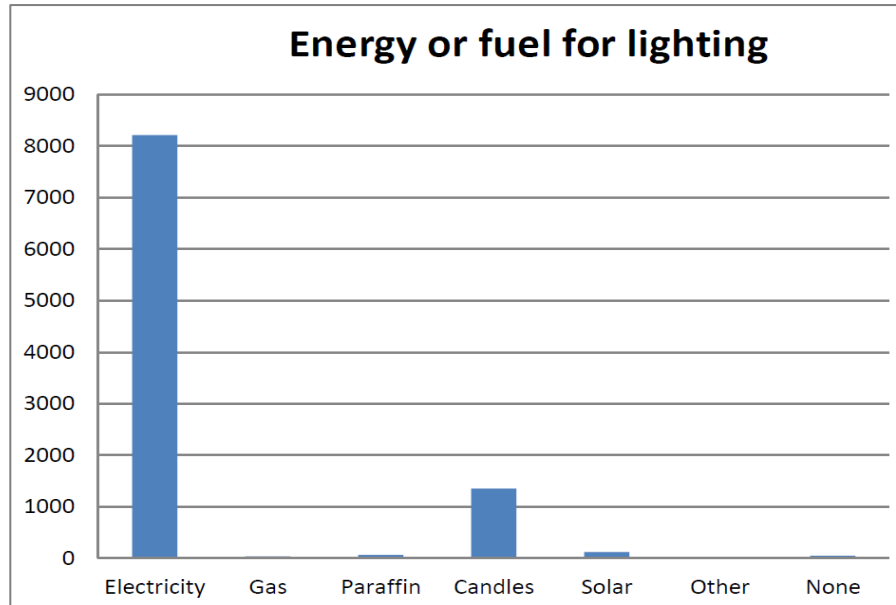
The table below (table 16) shows an increase in the proportion of households in the Ga-Segonyana municipality using a pit-latrine toilet, from 62.1% in 1996 to 67.4% in 2016. There is a slight decrease in the proportion of households that utilize flush or chemical toilets from 23.8% in 1996 to 23.4% in 2016.

Table 16: 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 17: 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

(16) 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 remembrance.
6. Archaeological and palaeontological sites.
7. Graves and burial sites.
8. Lake areas, offshore islands and the admiralty 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 application area.

(b) Description of the Current Land Use

(1) Land Use before Prospecting / Mining:

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

If the prospecting operation proves positive the only other use in this area will be for prospecting or mining for Kieselgurh.

(2) Evidence of Disturbance:-

On the application area there are existing roads and farm steads.

(3) Existing Structures:-

The only structures on the application area is the existing roads and farmsteads.

All 100m safety borders from infrastructure will be kept.

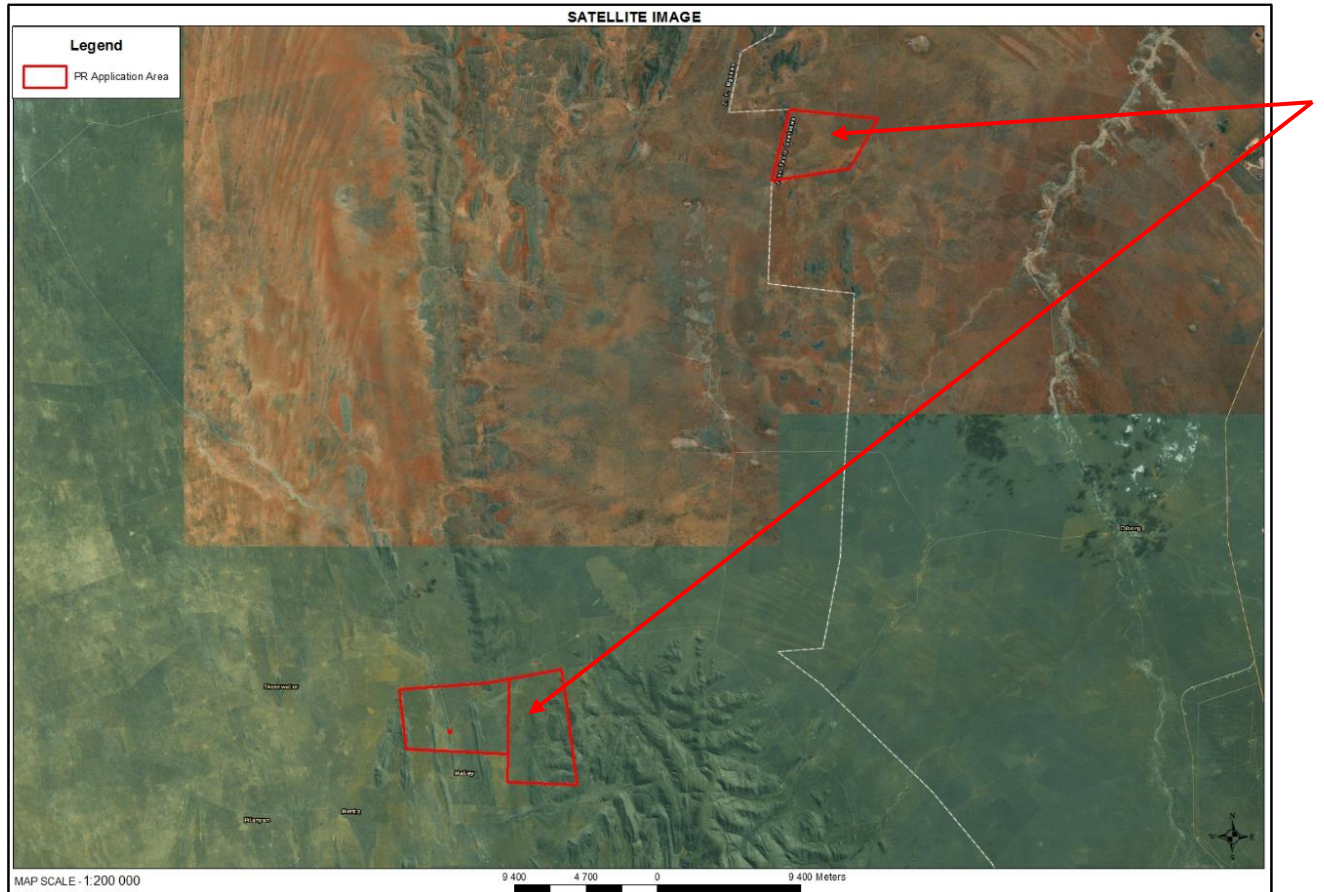


Figure 22. Satellite image of the application area

(c) Description of Specific Environmental Features and Infrastructure on Site

The infrastructure on site comprehensively discussed in section d(ii) as part of the Prospecting / Mining methodology discussion, as well as in section g as part of the mine footprint description. Furthermore, a comprehensive description of the environment was presented in section (i) as part of the baseline report.

(d) Environmental and current land use map (Show all environmental, and current land use features)

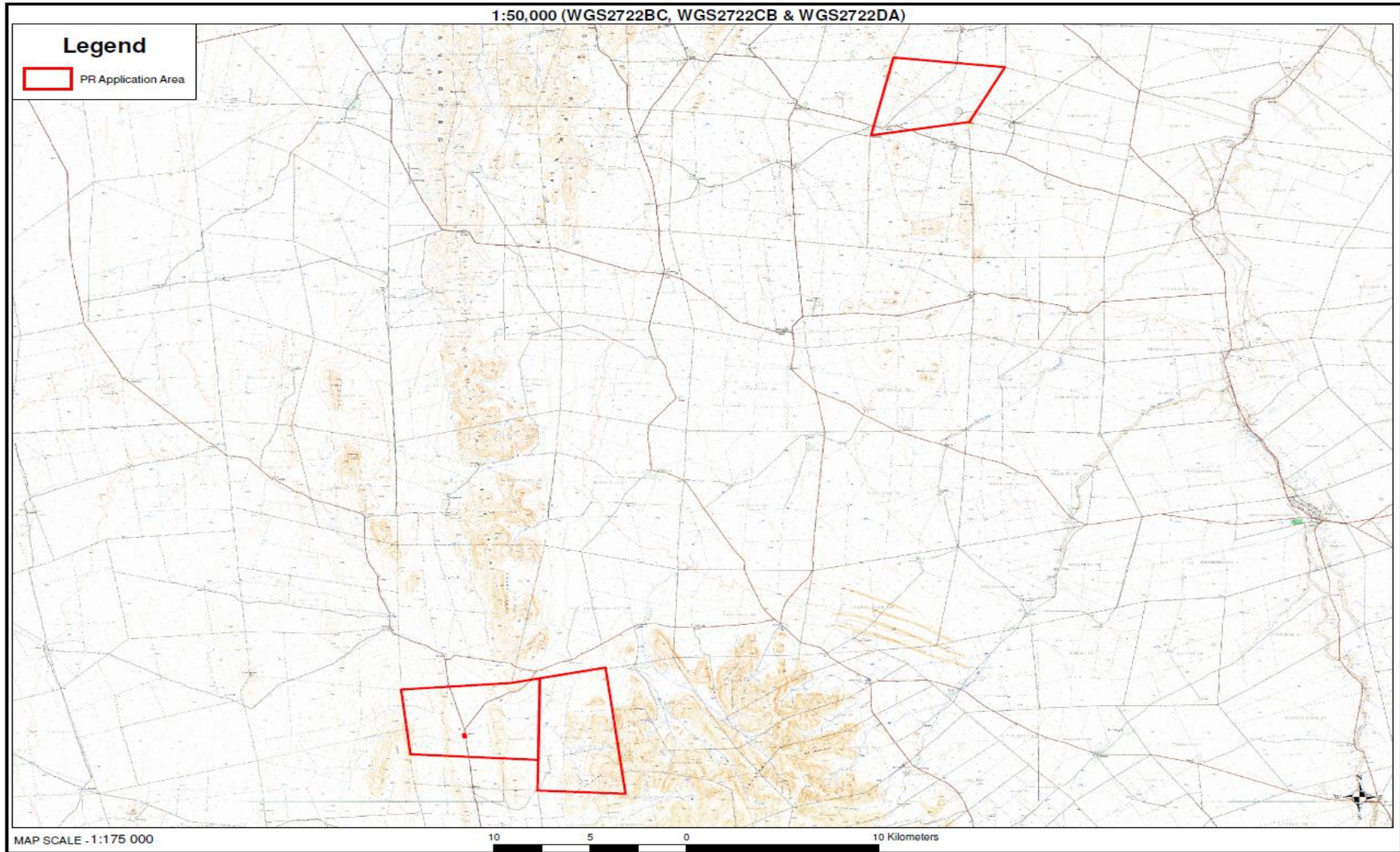


Figure 23. Environmental and current land use map on 1:50 000 topographical map

v) Impacts identified

(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.)

Nature of Impact	Significance	Probability	Duration
Sterilisation of mineral resources.	Low	Highly unlikely	Decommissioning
Changes to surface topography due to topsoil removal, prospecting pits (bulk sampling), placement of infrastructure and development of residue deposits.	Low to medium	Certain	Permanent Post-closure
Soil erosion by water and wind on disturbed and exposed soils; potential for dust production and soil microbial degradation; potential contamination of soils due to spillages.	Low to medium	Possible	Long Term Life of prospecting operation
Loss of land capability through topsoil removal, disturbances and loss of soil fertility.	Low to medium	Possible	Short term
Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation of prospecting pits.	Low to medium	Possible	Short term
Pollution of underground water sources.	Low	Highly unlikely	Long Term Life of operation
Deterioration of water resources through prospecting.	Low to medium	Possible	Long Term Life of operation
Deterioration in water quality through spillages and runoff from site.	Low to medium	Possible	Long Term Life of operation
The clearance of vegetation; potential loss of floral species with conservation value; potential loss of ecosystem function when bulk sampling.	Low to medium	Certain	Long Term Life of operation
Proliferation of alien invasive plants species.	Low	Possible	Long Term Residual
Displacement of faunal species.	Low	Possible	Long Term Life of operation
The loss, damage and fragmentation of floral and faunal habitats; potential loss of ecosystem function.	Low	Possible	Long Term life of prospecting operation
Sources of atmospheric emission associated with the prospecting operation are likely to include fugitive dust from materials handling	Low	Certain	Life of Operation Decommissioning

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operations, wind erosion of stockpiles and vehicle entrainment of road dust.			
Increase in continuous noise levels; the disruption of current ambient noise levels; and the disruption of sensitive receptors by means of increased noise and vibration.	Low to medium	Certain	Long Term Life of Operation
Visual impact of the mine infrastructure, slimes dams and stockpile; visibility of dust.	Low to medium	Certain	Life of Operation Decommissioning
Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low to medium	Possible	Life of Operation Decommissioning
The deterioration of sites of cultural and heritage importance.	Low	Possible	Life of Operation
Loss of agricultural potential; influx of workers to the area increases health risks and loitering (resulting in lack of security and safety); negative impact of employment loss during site closure.	Low to medium	Certain	Short-term and Closure
Loss of trust and a good standing relationship with the IAPs.	Low to medium	Possible	Life of Operation Decommissioning
Positive socio-economic impacts during operation, upliftment of previously disadvantaged communities.	Low to Medium	Certain	Life of Operation Decommissioning to residual

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)

The limits were defined in relation to the Prospecting Characteristics. Those for probability, significance and duration are subjective, based on rule of thumb and experience. The significance of the impacts is defined as follows:

The assessment of the impacts has been conducted according to a synthesis of criteria required by the integrated environmental management procedure.

Nature of impact

This is an appraisal of the type of effect the activity would have on the affected environmental component. Its description should include what is being affected, and how.

Extent

The physical and spatial size of the impact. This is classified as follows:

- **Local**
The impacted area extends only as far as the activity, e.g. a footprint.
- **Site**
The impact could affect the whole, or a measurable portion of the property.
- **Regional**
The impact could affect the area including the neighbouring farms, transport routes and the adjoining towns.

Duration

The lifetime of the impact which is measured in the context of the lifetime of the proposed phase (i.e. construction or operation).

- **Short term**
The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.
- **Medium term**
The impact will last up to the end of the prospecting period, where after it will be entirely negated.
- **Long term (Residual)**
The impact will continue or last for the entire operational life of the mine, but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent**
The only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

Intensity

This describes how destructive, or benign, the impact is. Does it destroy the impacted environment, alter its functioning, or slightly alter it. These are rated as:

- **Low**

This alters the affected environment in such a way that the natural processes or functions are not affected.

- **Medium**
The affected environment is altered, but function and process continue, albeit in a modified way.
- **High**
Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

Probability

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:

- **Improbable**
The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
- **Probable**
There is a possibility that the impact will occur to the extent that provisions must be made therefore.
- **Highly probable**
It is most likely that the impacts will occur at some or other stage of the development.
- **Definite**
The impact will take place regardless of any preventative plans, and mitigation measures or contingency plans will have to be implemented to contain the impact.

Determination of significance

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The classes are rated as follows:

- **No significance**
The impact is not likely to be substantial and does not require any mitigatory action.
- **Low**
The impact is of little importance, but may require limited mitigation.
- **Medium**
The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
- **High**
The impact is of great importance. Failure to mitigate, with the objective to reduce the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

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 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 prospected areas will be rehabilitated, but full restoration of soil might only occur over some time, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

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

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

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

Construction and prospecting activities on site will reduce the natural habitat for ecological systems to continue their operation. Vehicle traffic generates 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 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 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 mine 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 mine 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 prospecting opportunity to gain access to a mineral resource through proper planning .
- ❖ The prospecting area 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 the mine manager.

Topography

Level of risk: Low to medium

Mitigation measures

- ❖ Prospecting with bulk sampling and rehabilitate material back up to natural ground level.
- ❖ Do controlled dumping.
- ❖ Employ effective rehabilitation strategies to restore surface topography of the area and plant site.
- ❖ Stabilise the bulk sampling sites.
- ❖ All temporary infrastructures will be demolished during closure.

Soil Erosion

Level of risk: Low to medium

Mitigation measures

- ❖ At no point may plant cover be removed within no-development zones.
- ❖ All attempts must be made to avoid exposure of dispersive soils.
- ❖ Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.
- ❖ Ground exposure should be minimised in terms of the surface area and duration, wherever possible.
- ❖ The prospecting operation must co-ordinate different prospecting activities in order to optimise the utilisation of the invasive prospecting and thereby prevent repeated and unnecessary activities.
- ❖ The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers.
- ❖ The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion.
- ❖ 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 and bermed on the higher laying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- ❖ Stockpiles susceptible to wind erosion are to be covered during windy periods.
- ❖ Audits must be carried out at regular intervals to identify areas where erosion is occurring.
- ❖ Appropriate remedial action, including the rehabilitation of the eroded areas, must occur.
- ❖ Rehabilitation of the erosion channels and gullies.
- ❖ Dust suppression must take place, without compromising the water balance of the area.

- ❖ 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.

Soil Pollution

Level of risk: Low to 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 to medium

Mitigation measures

- ❖ Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities.
- ❖ Surface agreement to be signed with land owners.
- ❖ Employ effective rehabilitation strategies to restore land capability and land use potential of the area.
- ❖ All activities to be restricted within the demarcated areas.
- ❖ Ensure that land which is not used during construction is made available for grazing if possible.

Groundwater

Level of risk: Low to 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.

Surface Water**Level of risk:** Low to 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.
- ❖ Provide bins for staff at appropriate locations, particularly where food is consumed.
- ❖ The prospecting area 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**

- ❖ Minimise the footprint of transformation.
- ❖ Encourage proper rehabilitation of mined areas.
- ❖ Encourage the growth of natural plant species.
- ❖ Ensure measures for the adherence to the speed limit.
- ❖ Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting.
- ❖ It is recommended that these plants are identified and marked prior to bulk sampling.
- ❖ These plants should, where possible, be incorporated into the design layout of bulk samples and left in situ.
- ❖ However, if threatened of destruction by prospecting, these plants should be removed (with the relevant permits from DAFF and 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.
- ❖ All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.

All Invasive Plants

Level of risk: Low to medium

Mitigation measures

- ❖ Minimise the footprint of transformation.
- ❖ Encourage proper rehabilitation of prospected areas.
- ❖ Encourage the growth of natural plant species.
- ❖ Mechanical methods (hand-pulling) of control to be implemented extensively.
- ❖ Annual follow-up operations to be implemented.

Fauna

Level of risk: Low

Mitigation measures

- ❖ 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 appointment of a full-time ECO (Environmental Control Officer) must render guidance to the staff with respect to suitable areas for all related disturbance.
- ❖ The extent of the prospecting areas (bulk sampling sites) should be demarcated on site layout plans, and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the prospecting site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors.
- ❖ All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.
- ❖ The ECO 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.
- ❖ 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.

Habitat

Level of risk: Low

Mitigation measures

- ❖ 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). No construction personnel or vehicles may leave the demarcated area except those authorised to do so.

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 bulk sampling 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 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, must 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 to medium

Mitigation measures

- ❖ Restrict prospecting activities to daytime unless agreements obtained to do 24hr operations.
- ❖ Systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy events.
- ❖ Where possible material stockpiles should be placed so as to protect the boundaries from noise to individual operations.
- ❖ Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect

increases which could lead to increase in the noise impact over time and increased complaints.

- ❖ Environmental noise monitoring should be carried out at regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted.

Visual Impacts

Level of risk: Low to medium

Mitigation measures

- ❖ Infrastructure should be placed to optimise the natural screening capacity of the vegetation.
- ❖ Where practical, protect existing vegetation clumps during in order to facilitate screening during the prospecting operations.
- ❖ Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the prospecting site free from additional unsightly elements.
- ❖ Dust suppression procedures should be implemented especially on windy days during earth works.
- ❖ Rehabilitation should aim to establish a diverse and self-sustaining surface cover that is visually and ecologically representative of naturally occurring vegetation species.
- ❖ Implement a management plan for the post-prospecting site in order to control the invasion of alien vegetation and to manage erosion, until the site is fully rehabilitated.

Traffic and Road Safety

Level of risk: Low to medium

Mitigation measures

- ❖ Implement measures that ensure the adherence to traffic rules.

Heritage Resources

Level of risk: Low to medium

Mitigation measures

- ❖ The heritage if any is encountered and cultural resources (e.g. graveyards, ruins, historic structures, etc.) must be protected and preserved by the delination of no go zones.
- ❖ Stone tools should be avoided where possible and fresh exposure should be recorded before destruction. All stone tool artefacts should be recorded, mapped and collected before destruction.
- ❖ Should development necessitate impact on any building structures, the developer should apply for a SAHRA Site Destruction Permit prior to commencement of construction.

Socio-Economic

Level of risk: Low to medium

Mitigation measures

- ❖ The mine must ensure that false expectations are not created regarding job creation.
- ❖ Jobs must be allocated as advertised and in so far as is possible to local inhabitants.
- ❖ 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 to medium

Mitigation measures

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

ix) The outcome of the site selection Matrix. Final Site Layout Plan

(Provide a final site layout plan as informed by the process of consultation with interested and affected parties)

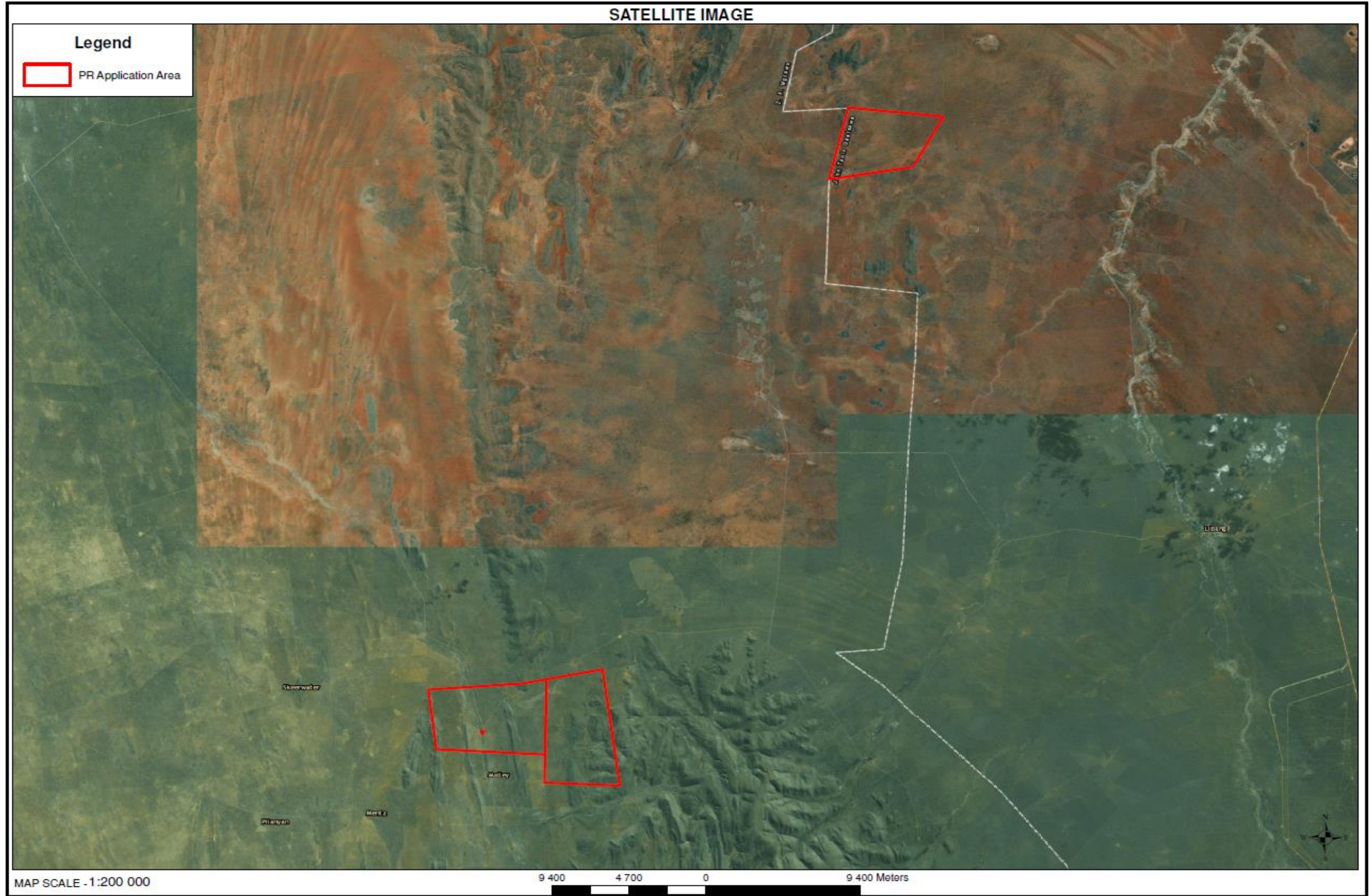


Figure 24. Satellite image

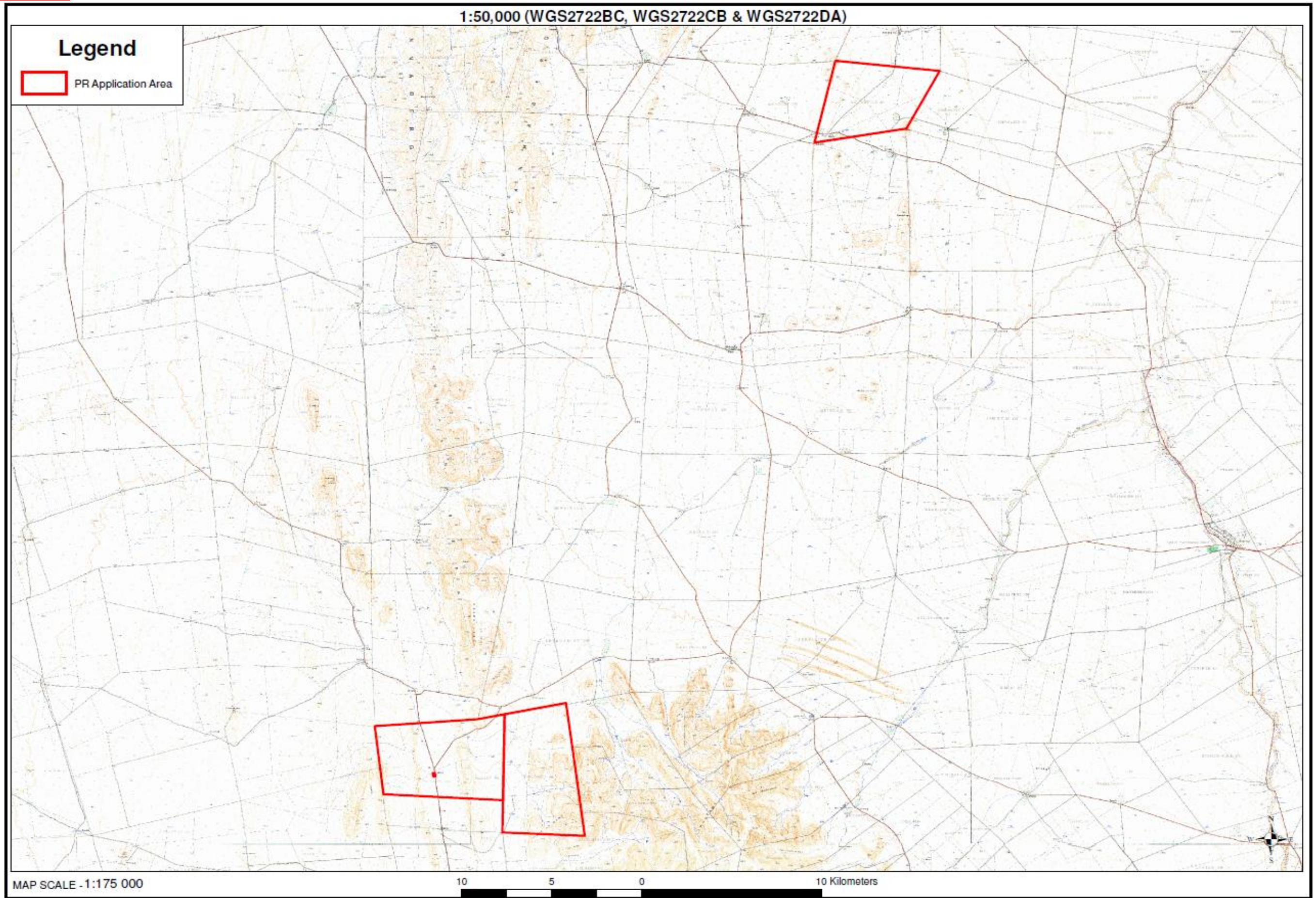


Figure 25. Final site layout plan

x) 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 areas. There is therefore no other alternative with regard to the overall operation footprint.

xi) Statement motivating the preferred site.

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

Not applicable. There is no alternative development location for the site as this is the area with the possible mineral resource.

i) Plan of study for the Environmental Impact Assessment Process**i) Description of alternatives to be considered including the option of not going ahead with the activity**

- Land use development alternatives:
The site layout may vary, depending on the operational requirements. However the final design and layout of the infrastructure have been planned and decided upon by the developer on the grounds of reserves, and placement of infrastructure based on hauling distance, environmental features such as wind direction, heritage findings, protected species, and stormwater management on the site.

- No-go option:
The following positive impacts will be lost if the proposed prospecting project is not developed:
 - o TAX and VAT obligations to SARS as well as Royalties;
 - o CAPEX spent locally and regionally;
 - o Employment opportunities;
 - o Payroll income;
 - o Operating expenditure and maintenance (OPEX);
 - o Revenue.

Prospecting activities are believed to be the most economically beneficial option for the area as the prospecting activities indicated to be positive.

If the operation does not continue it would hold back any potential employment for Kuruman/ Olifantshoek 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 inhibited.

Prospecting and Mining forms an integrated part of the social and economical growth of South Africa and more specifically the Northern Cape Province.

ii) Description of the aspects to be assessed as part of the environmental impact assessment process

(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control berms, roads, pipelines, powerlines, conveyers, etc..etc...)

1. The clearing of vegetation for:
 - Access roads and haul roads
 - Surface infrastructure
 - Product Stockpile area
 - Waste disposal site (domestic and industrial waste)
2. The stripping and stockpiling of topsoil.
3. Load and Haul Operation for the prospecting operation (bulk sampling).
 - Loading, hauling.
4. Altering the characteristics of surface water features.
5. The development of temporary stockpiles:
 - Topsoil storage area;
6. The rehabilitation of footprint areas where the bulk sampling sites have been excavated.
7. Loading, hauling and transporting of bulk sampling material.
8. Water holding facilities, pipeline and stormwater control:
 - Clean & Dirty water system;
 - Water tank.
9. Fuel storage and refuelling bays;
 - Fuel Storage facility (Diesel tanks);
 - Concrete bund walls and diesel depots.
10. Supporting infrastructure:
 - Temporary Offices;
 - Office Parking Bay;
 - Temporary Workshop and Wash bay;
 - Salvage yard (Storage and laydown area);
 - Ablution facilities/ Sewage facilities;
 - Generators;

i. Description of aspects to be assessed by specialists:

An Archaeologist and Palaeontologist will be contacted to do a survey on the farm for archaeologically and palaeontology sensitive areas on the farm. Also an Ecological study will be done. All information will be used to identify areas that can be sensitive and to make the necessary provision to avoid these areas. Any other Specific specialist reports will be done when specifically requested by any Department or in interested and affected party consultation referred to.

ii. Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives:

The receiving environment will be determined using a combination of on-site observations, spatial information, project description, site layout and previous studies currently available to the EAP. Based on the EAPs knowledge and experience, the receiving environment will include geological features, topography, land use, archaeological and historical sites, surface water, groundwater, terrestrial ecology, air quality, noise, etc.

The identification of potential impacts of the prospecting activity will be based on the legal requirements; the nature of the proposed activity; the nature of the receiving environment; and issues raised during the public participation process. Considering the factors listed above and based on the EAPs knowledge and experience, environmental impacts that could potentially result from the prospecting activities include impacts on air quality, noise, fauna, flora, terrestrial ecology, heritage resources, socio-economy, visuals, storm water and erosion.

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.

iii. The proposed method of assessing duration significance:

The lifetime of the impact will be measured in the context of the lifetime of the proposed phase or activity.

Weight	Duration of Impact	Explanation of Duration
1	Very Short	Less than 1 year
2	Short	1 to 5 years
3	Medium	6 to 15 years
4	Long term (Life of project)	16 to 50 years
5	Very Long term	Longer than 50 years
6	Permanent	Permanent

- Short term

The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.

- **Medium term**

The impact will last up to the end of the prospecting period, where after it will be entirely negated.

- **Long term**

The impact will continue or last for the entire operational life of the prospecting, but will be mitigated by direct human action or by natural processes thereafter.

- **Permanent**

The only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

iv. The stages at which the Competent Authority will be consulted:

Consultation with the Competent Authority will take place throughout the application process, however more specifically; consultation will take place before submission of the Scoping Report and again before submission of the EIA/EMPR Report.

v. Particulars of the public participation process with regard to the Impact Assessment process that will be conducted:

1. Steps to be taken to notify interested and affected parties:

(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h)(ii) herein.)

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

The process as described by NEMA for Environmental Authorisation was followed. See table 5 below 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) will be placed in the Kathu Gazette between the week of 16 April 2021 and 23 April 2021 to notify all other interested and affected parties.

The Scoping Report was put on disc and was distributed to all the registered parties per registered mail on 13 April 2021.

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

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

2. Details of the engagement process to be followed:

(Describe the process to be 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 and record of such consultation will be required in the EIA at a later stage.)

The following procedures will be followed:

- The Scoping Report has been distributed to all registered parties via registered mail in April 2021.
- All other documentation (Scoping, EMP and EMPR) will be made available in public libraries.
- Records will be kept of the complaints and the mitigation measures implemented.

3. Description of the information to be provided to Interested and Affected Parties:

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land.)

The following information will be provided to IAPs:

- The site plan;
- List of activities to be authorised;
- Scale and extent of activities to be authorised;
- Typical impacts of activities to be authorised;
- The duration of the activity.

The following information will be requested from the IAPs:

- To provide information on how they consider that the proposed activities will impact on them or their socio-economic conditions;
- To provide written responses stating their suggestions to mitigate the anticipated impacts of each activity;
- To provide information on current land uses and their location within the area under consideration;
- To provide information on the location of environmental features on site to make proposals as to how and to what standard the impacts on site can be remedied. They will be requested to make written proposals;
- To mitigate the potential impacts on their socio economic conditions to make proposals as to how the potential impacts on their infrastructure can be managed, avoided or remedied).

vi. Description of the tasks that will be undertaken during the environmental impact assessment process:**Determining environmental attributes**

The receiving environment will be determined using a combination of on-site observations, spatial information, project description, site layout and previous studies currently available to the EAP. Based on the EAPs knowledge and experience, the receiving environment will include geological features, topography, land use, archaeological and historical sites, surface water, groundwater, terrestrial ecology, air quality, noise, etc.

Identification of impacts and risks

The identification of potential impacts of the prospecting activity will be based on the legal requirements; the nature of the proposed activity; the nature of the receiving environment; and issues raised during the public participation process.

Considering the factors listed above and based on the EAPs knowledge and experience, environmental impacts that could potentially result from the prospecting activities include impacts on air quality, noise, fauna, flora, ground water, surface water, terrestrial ecology, heritage resources, socio-economy, visuals, stormwater and erosion.

Consideration of alternatives

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 prospecting 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, mining 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 geological location of the proposed mineral resource.

Process to assess and rank impacts

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

Table 18: Explanation of PROBABILITY of impact occurrence

Weight	Probability of Impact Occurrence	Explanation of Probability
1	Very Low	<20% sure of particular fact or likelihood of impact occurring
2	Low	20 – 39% sure of particular fact or likelihood of impact occurring
3	Moderate	40 – 59% sure of particular fact or likelihood of impact occurring
4	High	60 – 79% sure of particular fact or likelihood of impact occurring
5	Very High	80 – 99% sure of particular fact or likelihood of impact occurring
6	Definite	100% sure of particular fact or likelihood of impact occurring

Table 19: Explanation of EXTENT of impact

Weight	Extent of Impact	Explanation of Extent
1	Site Specific	Direct and Indirect impacts limited to site of impact only
2	Surrounding Area	Direct and Indirect impacts affecting environmental elements within 2 km of site
3	Local Municipality	Direct and Indirect impacts affecting environmental elements within the Olifantshoek area
4	Regional/District	Direct and Indirect impacts affecting environmental elements within Kuruman District)
5	Provincial	Direct and Indirect impacts affecting environmental elements in the Northern Cape Province

Table 20: Explanation of DURATION of impact

Weight	Duration of Impact	Explanation of Duration
1	Very Short	Less than 1 year
2	Short	1 to 5 years
3	Medium	6 to 15 years
4	Long term (Life of project)	16 to 50 years
5	Very Long term	Longer than 50 years
6	Permanent	Permanent

Table 21: Explanation of SEVERITY of the impact

Weight	Impact Severity	Explanation of Severity
1	No Impact	There will be no impact at all – not even a very low impact on the system or any of its parts.
2	Very Low	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.
3	Low	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.
4	Moderately Severe	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.
5	High Severance	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.
6	Very High Severity	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.

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

The criteria used to assess the significance of the impacts are shown in the table below. The limits were defined in relation to prospecting 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:

$(\text{Severity} + \text{Extent} + \text{Duration}) \times \text{Probability weighting}$

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

SIGNIFICANCE				
Colour Code	Significance rating	Rating	Negative Impact	Positive Impact
	Very low	3 -16	Acceptable/Not serious	Marginally Positive
	Low	17 - 22	Acceptable/Not serious	Marginally Positive
	Medium-Low	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

Significance 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.

Medium Low- 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.

Very High - Of the highest order possible within the bounds of impacts which could occur. There would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted.

vii. Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored:

ACTIVITY Whether listed or not listed (e.g. excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc...)	POTENTIAL IMPACT (e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc...etc...)	MITIGATION TYPE modify, remedy, control or stop (e.g. noise control measures, stormwater control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc...etc...) (e.g. modify through alternative method. Control through management and monitoring through rehabilitation.)	POTENTIAL FOR RESIDUAL RISK
Ablution facilities Chemical toilets	<ul style="list-style-type: none"> • Soil contamination • Groundwater contamination • Odours 	<ul style="list-style-type: none"> • Maintenance of chemical toilets on regular basis. • Removal of containers upon closure. 	Low
Clean & Dirty water system	<ul style="list-style-type: none"> • Surface disturbance • Groundwater contamination • Soil contamination • Surface water contamination 	<ul style="list-style-type: none"> • Maintenance of berms and trenches. • Oil traps used in relevant areas. • Drip trays used. • Immediately clean hydrocarbon spill. 	Low to medium
Diesel tanks or cart	<ul style="list-style-type: none"> • Groundwater contamination • Surface water contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance 	<ul style="list-style-type: none"> • Maintenance of diesel tanks and bund walls. • Oil traps. • Groundwater quality monitoring. • Drip tray at re-fuelling point. • Immediately clean hydrocarbon spill. 	Low to medium
Bulk sampling	<ul style="list-style-type: none"> • Dust • Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance • Surface water contamination 	<ul style="list-style-type: none"> • Access control • Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Continuous rehabilitation • Stormwater run-off control • Immediately clean hydrocarbon spill • Drip trays • Erosion control 	Low to medium

SCOPING REPORT –ALET MARITZ MYNBOU PTY LTD (Gamahuli, Malley and La Rochelle)

Generators	<ul style="list-style-type: none"> • Groundwater contamination • Surface water contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance 	<ul style="list-style-type: none"> • Access control • Maintenance of generator and bund walls • Noise control and monitoring • Oil traps • Groundwater quality monitoring • Immediately clean hydrocarbon spill 	Low
Office – Pre-fabricated office blocks on concrete	<ul style="list-style-type: none"> • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance 	<ul style="list-style-type: none"> • Immediately clean hydrocarbon spill • Rip disturbed areas to allow re-growth of vegetation cover 	Low
Parking bay	<ul style="list-style-type: none"> • Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance 	<ul style="list-style-type: none"> • Dust control and monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover 	Low
Roads	<ul style="list-style-type: none"> • Dust • Possible Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance 	<ul style="list-style-type: none"> • Maintenance of roads • Dust control and monitoring • Noise control and monitoring • Speed limits • Stormwater run-off control. • Erosion control • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover 	Low
Salvage yard	<ul style="list-style-type: none"> • Possible Groundwater contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance • Surface water contamination 	<ul style="list-style-type: none"> • Access control • Maintenance of fence. • Stormwater run-off control • Immediately clean hydrocarbon spill 	Low

Stockpile area	<ul style="list-style-type: none"> • Dust • Possible Groundwater contamination • Surfacewater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance 	<ul style="list-style-type: none"> • Dust control and monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover 	Low
Topsoil storage area	<ul style="list-style-type: none"> • Dust • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil disturbance • Surface disturbance 	<ul style="list-style-type: none"> • Dust control and monitoring • Stormwater run-off control. • Continuous rehabilitation • Rip disturbed areas to allow re-growth of vegetation cover • Backfilling of topsoil during rehabilitation 	Low
Waste disposal site	<ul style="list-style-type: none"> • Groundwater contamination • Surface water contamination 	<ul style="list-style-type: none"> • Storage of waste within receptacles • Storage of hazardous waste on concrete floor with bund wall • Removal of waste on regular intervals. 	Low
Washbay	<ul style="list-style-type: none"> • Possible Groundwater contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination 	<ul style="list-style-type: none"> • Groundwater quality and level monitoring • Concrete floor with oil/water separator • Stormwater run-off control • Immediately clean hydrocarbon spills 	Low
Water tank with filter system: It is anticipated that the operation will establish 1 x 10 000 litre water tanks for potable water.	<ul style="list-style-type: none"> • Water and usage • Surface disturbance 	<ul style="list-style-type: none"> • Monitor water quality and quantity • Maintenance of tanks (check for leaks). 	Low

viii. **Other information required by the Competent Authority:**1. **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:-**a. **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 '7' and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein.)

The socio-economic conditions of the local community could be affected in two ways:

- Negative impacts to the welfare of the residents and workers through general nuisance, dust generation, damages to properties and any associated potential safety risks.
- Positive impacts through job creation and local business opportunities.
- The consultation with interested and affected parties is on-going and any issues, concerns or comments will be considered and included in the EIA report and control measures will be presented in the EMP report.

b. **Impact on any national estate referred to in Section 3(2) of the National Heritage Resources Act:**

(Provide the results of investigation, assessment and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in Section 3(2) of the National Heritage Resources Act, 1999 (Act 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 '8' and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein.)

No evidence is known as yet of any such sites and/or objects on the site itself. A heritage and palaeontological desktop study will be done for this application.

Should any heritage features and/or objects be located or observed, a heritage specialist will be contacted immediately. Observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that a heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This is true for graves and cemeteries as well.

ix. **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 details, 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 '9'.)

As mentioned before, the specific occurrence of possible kieselguhr resource in the area dictates the selection of the specific prospecting site and there are no alternatives in terms of project location.

The prospecting operation will provide 5 to 10 jobs and will also add to the increased economic activity and the area surrounding the farm.

Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR area adhered to e.g. rehabilitation and best practice principles.

x. Undertaking regarding correctness of information:

I, RH Oosthuizen, ID number 7004180037082, herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties has been correctly recorded in the report.

Signature of EAP
Date: 08 April 2021

xi. Undertaking regarding level of agreement:

I, RH Oosthuizen, ID number 7004180037082, herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with Interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

Signature of EAP
Date: 08 April 2021

- END -

APPENDIX 1

CURRICULUM VITAE

Roelina Henriette Oosthuizen

Cell: 084 208 9088

E-Mail: roosthuizen950@gmail.com

1. PERSONAL INFORMATION

Name: Roelina Henriette Oosthuizen

Surname: Oosthuizen (Maiden: Alberts)

Identity number: 7004180037082

Date of birth: 18 April 1970

Gender: Female

Marital status: Married (26 years) with 3 children

Driving license: Yes, Code EB

Languages: Fluent in Afrikaans and English

Nationality: South African

Criminal offences: None

Health: Excellent, fit

2. SYNOPSIS OF PROFESSIONAL CAREER

Roelina Henriette Oosthuizen has 22 years of experience in the environmental management field. She started her career in the area of Environmental Management and Environmental Impact Assessment (EIA) evaluation in 1997 at the Department of Minerals and Energy. After moving to industry in 2005, Roelien became involved in the practical aspects of environmental management. A major project during her early years outside of government was that of the EIA for a Game Reserve and Lodge development near Barkly-Wes, she did this project together with a consultancy firm from Kimberley AWS water solutions (Mr. Adriaan du Toit). In 2007 the Company she worked for was bought by a Canadian Group of Companies and she became more involved in practical aspects of the operations and worked closely with operations personnel in dealing with ongoing management of environmental impacts at the Mine (e.g. monitoring, auditing, operating procedures). She was also centrally involved in liaison with the authorities and with stakeholders in neighbouring areas.

During her time at the Canadian Group of Companies, Roelien was the environmental manager overseeing operations in the Barkly-West, Prieska and Douglas areas. She was responsible for preparing the environmental compliance documents for each operation which included Performance Assessments (Audit reports) and Financial Quantum submissions as well as new applications for Prospecting Rights and Mining Rights with the relevant Scoping, EIA / EMP documents. Her activities included liaison with stakeholders and also with the relevant Departments. During this time, Roelien became increasingly involved in environmental policy and strategy work, as well as the environmental aspects of corporate governance.

She has assisted a range of clients with Environmental Due Diligence audits and compliance audits. Roelien has also undertaken numerous environmental audits, particularly compliance and due diligence audits for clients in the mining industry. Thus, she is familiar with best practice standards in environmental auditing.

Roelien have also represented the South African Diamond Producers Organisation (SADPO) on the Environmental Policy Committee (EPC) at the Chamber of Mines between 2005 and 2011.

In a nutshell, Roelien has wide ranging experience and is thus well-positioned to assist clients in any matter related to sustainability and environmental management. This is achieved through her own skills base and on drawing on specialists.

3. QUALIFICATIONS

MEM (Master in Environmental Management) University of the Orange Free State (2000)
B – Comm NWU (1991)

4. TRAINING COURSES

Roelien have attended various mining and environmental conferences and seminars to stay abreast with the latest changes in legislation, legal compliance and policy positions in the sector.

October 1997	Mineral Laws Administration & Environmental Management (University of Pretoria)
July 2002	Project Management for Environmental Systems (University of the Orange Free State)
August 2004	Environmental and Sustainability in Mining Minerals and Energy Education and Training Institute (MEETI)
September 2005	Converting Old Order Rights to New Order Rights in Mining International Quality & Productivity Centre Johannesburg)
November 2006	Mine waste disposal and Achievement of Mine Closure
February 2007	Introduction to ArcGis 1
April 2010	Mining Law Update Conference (IIR BV South Africa)
November 2010	Social Labour Plans for Mining Workshop (Melrose Training)
August 2011	Mineral Resources Compliance and Reporting (ITC)
May 2012	Enviro Mining Conference 2012 (Sustainability and Rehabilitation) (Spectacular Training Conferences)
August 2012	Mineral Resources Compliance and Reporting 4th Annual (ITC)
March 2013	1st EnviroMining-Ensuring Environmental Compliance and reporting
March 2014	4th Annual EnviroMining Conference
March 2015	5th Annual EnviroMining Conference
February 2018	Seminar by the Department of Environmental Affairs on knowledge sharing workshops on the Screening Tool
October 2021	IAIAsa Symposium

5. PROFESSIONAL REGISTRATION

Registered Environmental Assessment Practitioner : Number 2019/1467 at EAPASA.

Registered as a professional at IAIAsa (International Association for Impact Assessment South Africa). IAIAsa is a voluntary organisation and is not a statutory body regulating the profession. Its members are however expected to abide by the organisations code of ethics.

6. PROFESSIONAL EXPERIENCE

Projects are listed below by area of expertise.

Environmental Management Systems (EMS) and Environmental Auditing

Development of EMS and Compilation of INCIDENT REPORT AND INVESTIGATION FORMS for the EMS of the Canadian group of Companies on various sites.

Undertaking of a range of due diligence and performance audits for operations, including those listed below:

Performance Assessment reports for a mining company with various infrastructure and mining operations near Barkly-West and Windsorton.

Performance Assessment reports for a mining company near Douglas.

Preparation of an environmental auditing checklist / protocol for a Community project with restitution ground in assisting the community to determine environmental legal compliance at their operations.

Environmental audit as part of a closure with Dr. Betsie Milne another specialist. This Annual Rehabilitation Plan has been developed to match 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). This project had the objective of ensuring that this company are accounting for environmental liabilities and risks adequately. The plan distinguishes between (a) those environmental rehabilitation liabilities pertaining to drilling, for which the Company was legally responsible and (b) those environmental rehabilitation liabilities pertaining to historic mining activities, for which the Company is not legally responsible, but consider performing as part of their best practice environmental principals. Three costing scenarios were explored in order to evaluate the most feasible rehabilitation plan, i.e. (1) Total cost (worst-case scenario) including risks, (2) legally required cost and (3) features currently available that do not involve any risks.

Sustainability projects: policies, guidelines, strategies and performance reporting

Involved in the compilation of 43-101 technical documents for listed companies which included information on sustainability and performance in rehabilitation and sustainable mining.

Alien species eradication project guideline and strategy near Barkly-Wes in terms of Regulations that have been promulgated in terms of the Conservation of Agricultural Resources Act, No. 43 of 1983 further make it unlawful to allow various species of weeds and invader plants to grow. The target species was Wild tobacco (declared weed), Pink Tamarisk (declared weed) and Mexican poppy, it also involved the community for job creation and training (2008).

Investigations for a Company near Prieska on Development of a biodiversity offsets policy for the applications for forestry tree licences for protected tree species.

Strategic Environmental Studies and Environmental Impact Assessment (EIA)

Undertaking of a Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2006 for a Private Individual which involved the proposed extension of a roof over an existing deck with two wood pillars by means of the excavating of 0.5m X 0.5m X 1m X 2 (½m²) OF SOIL WITHIN 100M OF THE HIGH WATER MARK OF THE SEA. A Positive Record of Decision (ROD) Granted (2010).

Undertaking of an ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) near Boshof for a kimberlite Diamond Mining Company (2015)

Undertaking of a strategic environmental review and amendment for a Chinese group of Companies near Postmasburg. The study provided baseline environmental information and a high-level review of the potential impacts of various components of the development (2014 – 2016). Roelien worked as a member (EAP) of a large team consisting of a project Coordinator, attorneys, water specialists, other specialist and an engineer.

Environmental Impact Assessments for various developments including the proposed mining project for the former retrenchees of De Beers in Kimberley. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialist with contributions of specialist reports to compile the EIA EMP report (2017). Roelien worked as a member (EAP) of a team consisting of De Beers (attorneys and environmentalists), the retrenchees, the appointed contractor, EKAPA, and specialist appointed for the studies.

Environmental Impact Assessments for a Salt operation near Upington. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialists with contributions of specialist reports to compile the EIA EMP report (2019). Roelien also worked as part of a team with the Company and another consultant that started with the Water Use Licence application. The public participation was done to include the water use activities.

Environmental Impact Assessment for a change in scope of a prospecting right application consisting of the sole and exclusive right to prospect for iron, silver, zinc, copper and sulphur ore. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialists with contributions of specialist reports to compile the EIA EMP report (2019). Roelien also worked as a member (EAP) of a team consisting of the directors of the company and specialists appointed for the studies

7. CAREER PATH

01 April 1997 to 28 February 2005

DEPT OF MINERALS & ENERGY

Senior Environmentalist - Assistant Director Environment

MAIN JOB FUNCTIONS

- Collect analyse and interpret information regarding the measurement of impacts of mining operations on the environment, the

rehabilitation of land surfaces.

- The prevention, control and combating of pollution.
- Co-ordinate and prioritise the rehabilitation of derelict and ownerless mines.
- Co-ordinate, investigate, audit and resolve environmental problems in conjunction with the Department of Water Affairs and Forestry, Department of Agriculture and the provincial Department of Tourism, Environment and Conservation.
- Address complaints and inquiries received from the public and mining industry.
- Consult with relevant authorities and interested and affected people regarding the approval of Environmental Management Programmes.
- Ensuring that rehabilitation standards are applied.
- Ensuring that the requirements stated in Environmental Management Programme Reports are adhered to.
- Conduct inspections and recommendations on mines that apply for closure.
- Evaluate mining licences and prospecting applications and recommend site-specific conditions according to legislative requirements.
- Constant liaison with the public, the mining industry and other government authorities on environmental matters, legislation and agreements.
- Influence new development processes through participation in the EMPR and EIA processes and give guidance through education and awareness programmes.
- Calculate and verify financial provision for outstanding rehabilitation.

01 March 2005 – 30 September 2012

Appointed as professional Mineral Law Administration and Environmental Manager for HC van Wyk Diamonds which was bought over in 2007 by a **Canadian group of Companies.**

MAIN JOB FUNCTIONS

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.

Undertaking of environmental reviews, audits and management plans:

Formulation of an environmental policy and guidelines for the Group.

Participation in the development of the budget for environmental expenditure.

Co-ordination of technical studies (e.g. monitoring of groundwater quality).

Environmental compliance measurement and reporting with respect to environmental permit conditions (e.g. Forestry Licences and water sampling for Water Use Licences).

Development of environmental guidelines for contractors on sites.

Liaison with regulatory authorities on compliance with environmental legislation.

Documentation of environmental incidents.

Environmental awareness and training.

Development of a public participation strategy.

Formulation of a complaint's procedure.

01 October 2012 to Present

Appointed as professional Mineral Law Administration and Environmental Manager for **Mentor Trade and Investments Pty Ltd**

MAIN JOB FUNCTIONS

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans.
Formulation of an environmental policy and guidelines for the Mine.
Co-ordination of technical studies (e.g. monitoring of groundwater quality) as well as updating of the Mine's IWWMP.
Environmental compliance measurement and reporting with respect to environmental permit conditions (e.g. as water sampling and effluent).
Development of environmental guidelines for contractors.
Liaison with regulatory authorities on compliance with environmental legislation.
Documentation of environmental incidents.
Environmental awareness and training.
Development of a public participation strategy.
Formulation of a complaint's procedure.

01 October 2012 to Present part time

*Appointed as EAP on some projects for **Wadala Mining and Consulting Pty Ltd***

*Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans.
Liaison with regulatory authorities on compliance with environmental legislation.
Environmental awareness and training.*

DIE UNIVERSITEIT
VAN DIE ORANJE-
VRYSTAAT



THE UNIVERSITY
OF THE ORANGE
FREE STATE

HIERMEE WORD VERKLAAR DAT DIE GRAAD THIS IS TO CERTIFY THAT THE DEGREE

Magister in Omgewingsbestuur
Master in Environmental Management

TOEGEKEN IS AAN
HAS BEEN CONFERRED UPON

ROELINA HENRIËTTE OOSTHUIZEN

NADAT AAN DIE STATUTE EN REGULASIES VAN IN ACCORDANCE WITH THE STATUTES AND
DIE UNIVERSITEIT VOLDOEN IS. AS BEWYS REGULATIONS OF THE UNIVERSITY. AS
DAARVAN PLAAS ONS ONS ONDERSKEIE WITNESS OUR RESPECTIVE SIGNA-
HANDTEKENINGE EN DIE SE&L VAN DIE TURES AND THE SEAL OF THE
UNIVERSITEIT HIERONDER. UNIVERSITY BELOW.



S. J. Booitze

.....
VISEKANSALIER/VICE-CHANCELLOR

G. N. van Wyk

.....
DEKAAN/DEAN

[Signature]

.....
REGISTRATEUR/REGISTRAR

BLOEMFONTEIN
2000-09-16

APPENDIX 3 PUBLIC PARTICIPATION