mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT
AND
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

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FILE REFERENCE NUMBER SAMRAD: MP30/5/1/1/2/15228PR

1 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 considered 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. 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

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2 OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process–

- Determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- Identify the alternatives considered, including the activity, location, and technology alternatives;
- Describe the need and desirability of the proposed alternatives,
- Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
  - The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - The degree to which these impacts—
    - Can be reversed;
    - May cause irreplaceable loss of resources; and
    - Can be managed, avoided or mitigated;
- Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
  - Identify and motivate a preferred site, activity and technology alternative;
  - Identify suitable measures to manage, avoid or mitigate identified impacts; and
  - Identify residual risks that need to be managed and monitored.

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Acronym	Expanded Name
AEL	Atmospheric Emission License in terms of NEM: AQA
BA	Basic Assessment (process or report)
BID	Background Information Documents
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983) as amended
CBA	Critical Biodiversity Area
COP	Codes of Practice
DMR	Department of Mineral Resources
DWS	Department of Water Affairs and Sanitation
EA	Environmental Authorisation in terms of NEMA
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act (Act 73 of 1989) as amended
EIA	Environmental Impact Assessment (process or report)
EIA Regulation	Environmental Impact Assessment Regulation published under NEMA
EMPr	Environmental Management Programme report
GDP	Gross Domestic Product
GIS	Geographical Information Systems
GN	General Notice (issued under an Act, providing notice or information)
GNR	General Notice Regulation (issued under an Act, providing instruction)
I&AP	Interested and Affected Parties
IAIA SA	International Association of Impact Assessment South Africa
MHSA	Mine Health and Safety Act (Act 29 of 1996) as amended
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002) as amended
MR	Mining Right in terms of the MPRDA
MRA	Mining Right Application in terms of the MPRDA
NAEIS	National Atmospheric Emissions Inventory System
NEM: AQA	National Environmental Management: Waste Act (Act 39 of 2004) as amended
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004) as amended
NEM: PAA	National Environmental Management: Protected Areas Act (Act 57 of 2003) as amended
NEM: WA	National Environmental Management: Air Quality Act (act 59 of 2008) as amended
NEMA	National Environmental Management Act (Act 107 of 1998) as amended
NFEPA	National Freshwater Ecology Priority Areas

NHRA	National Heritage Resources Act (Act No. 25 of 1999) as amended
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act (Act 35 of 1998) as amended
PPP	Public Participation Process
PRA	Prospecting Right Application in terms of the MPRDA
PR	Prospecting Right in terms of the MPRDA
PWP	Prospecting Work Programme
RoD	Record of Decision (for specific application)
SCC	Species of Conservation Concern
S&LP	Social and Labour Plan
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resource Agency
SAMRAD	South African Mineral Resources Administration System
SANBI	South African National Biodiversity Institute
SANS	South African National Standard (followed by standard number)
SAWIS	South African Waste Information System
SEMA	Specific Environmental Management Acts
SOP	Standard Operating Procedure
SPLUMA	Spatial Planning and Land Use Management Act (Act No.16 of 2013)
Stats SA	Statistics South Africa
TOPS	Threatened or Protected Species
WMA	Water Management Area
WML	Waste Management Licence in terms of NEM: WA

PART A
SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

3 SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

(a) Details of Contact Person and EAP:

(i) Details of the EAP (author of the report)

This reported was written by Sarah Wanless, Environmental Officer at Sitatunga Resources. The document was then sent to an external, independent EAP for the purposes of review and sign off.

Name: Sarah Wanless

Tel No: 011 783 7996

Fax No: 011 594 9159

E-mail address: sw@sitatunga.com

Summary of Qualifications:

- BA in Geography and Law
- Bachelor of Laws
- BSc Honours in Geography

Summary of Experience:

Sarah has 3 years' experience in Prospecting and drafting BARs and EMP reports. As part of her duties as an environmental officer she is tasked with assessing the social, environmental and heritage components of potential new projects, stakeholder management, GIS mapping and analysis and environmental management reporting for BARs and EMPs.

CVs attached as ***Appendix 1***.

(ii) Details of the external EAP (review of the report)

Name: Ruan Mostert

Tel No: 0716913310

E-mail address: ruan@wesst.co.za

Summary of Experience:

Summary of Qualifications

- Masters in Environmental Management
- BSc Honours in Conservation Ecology

Summary of Experience:

Ruan has participated in the completion of variety environmental projects throughout South Africa, including BAR's, EIAs and EMPR's for construction projects, mining houses, industrial developments as well as infrastructure and has more than 11 years' experience as an Environmental Assessment Practitioner. His experience also includes the completion of Section 24G applications, Environmental Management Plans, EMPR's for prospecting and mining right applications, environmental audit reports, acting as an Environmental Control Officer (ECO) compiling monthly environmental compliance audits for construction sites, implementing and maintaining ISO 14 001 Environmental Management Systems and acting as an external ISO 14001 auditor.

CVs attached as ***Appendix 1***.

(b) Location of the overall activity

The proposed site is located approximately 14km South East of Ogies, under the Emalahleni Local Municipality, in the Mpumalanga Province. The prospecting area is made up of the remaining extent of Nooitgedacht 37 (as seen in **Table 1** below) and the total area that will be affected is approximately 371.337173 Ha

Table 1: Farms included in the prospecting right application

Name:	Nooitgedacht 37 – Remaining Extent
Application area (Ha)	371.33 Ha
Magisterial district:	Emalahleni Local Municipality
Distance and direction from nearest town	~14km South East of Ogies
21-digit Surveyor General Code for each farm portion	T0IS00000000003700000

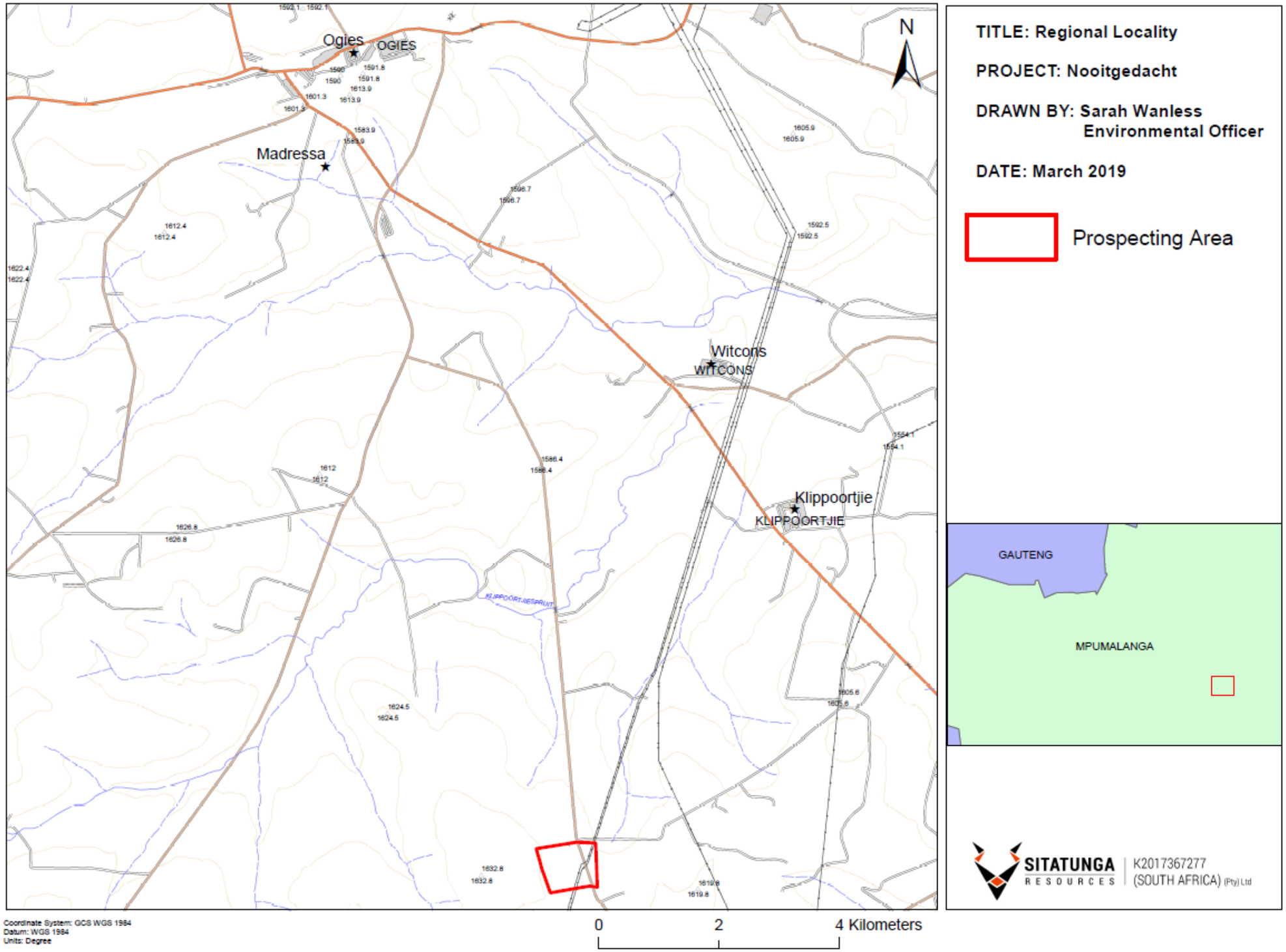
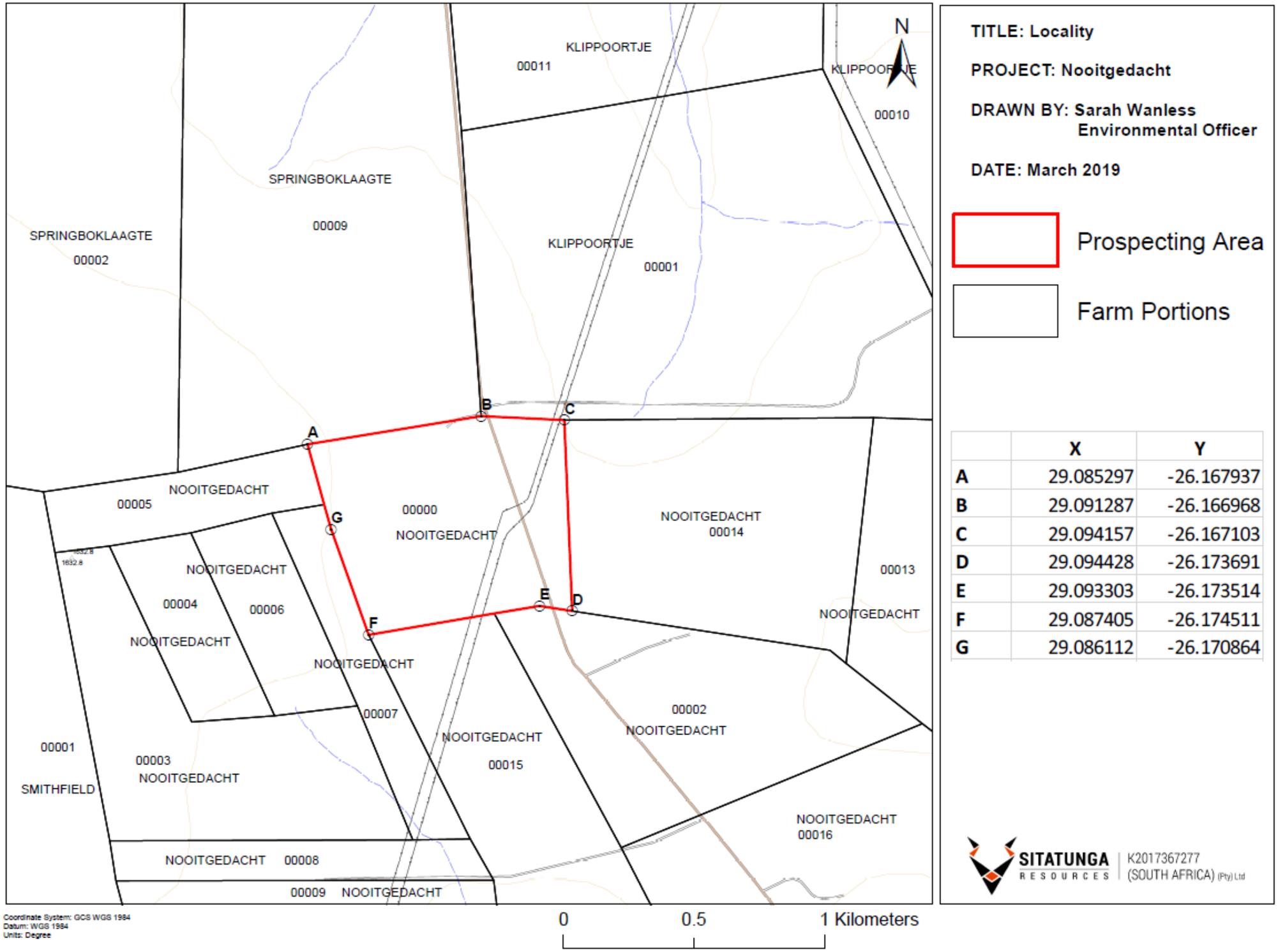


Figure 1 Regional Locality



	X	Y
A	29.085297	-26.167937
B	29.091287	-26.166968
C	29.094157	-26.167103
D	29.094428	-26.173691
E	29.093303	-26.173514
F	29.087405	-26.174511
G	29.086112	-26.170864

Figure 2 Site Locality Boundary

(c) Description of the scope of the proposed overall activity

The following map indicates areas where prospecting activities will be held. This layout has considered all sensitivities of the site.

Figure 3 Prospecting Area, Indicating preliminary position of prospecting boreholes in relation to water bodies

(i) Listed and specified activities

Table 2 Listed and Specified Activities

NAME OF ACTIVITY (**E.g. For prospecting** - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc. **E.g. for mining, -** excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
Access routes	Farm roads will be used as far as possible. No additional roads will be constructed.		
Drilling	10m^2 per borehole. It is anticipated that 20 boreholes will be drilled.	X	GNR 983 Activity 20
Casing of boreholes	10m^2 per borehole. It is anticipated that 20 boreholes will be drilled.		
Ablution facility (portable toilets)	Portable toilets will be used		
Temporary core/equipment store and site office; comprising of shade and seating for meals may be established. Staff will be accommodated in town.	0.05 Ha		
Hydrocarbon Storage	Less than 80m^2		
Rehabilitation of boreholes	See above		

(ii) Description of the activities to be undertaken

The proposed activities on site will include:

- Non-invasive prospecting, which will consist of:
    - A desktop study and literature review;
    - Obtaining historical borehole data and resource information;
    - Feasibility studies;
    - Geophysical site visit and survey will be conducted by a field geologist and a geophysics team; and
    - Data will be extracted and plotted into geological maps. Areas for invasive prospecting will be identified for resource determination.

- Invasive prospecting:

Core drilling will then be targeted for areas identified through the non-invasive techniques described above for reserve determination and mine planning. Each borehole will disturb an area of approximately 10m^2; however, the number of boreholes required can only be finalised once the non-invasive prospecting as detailed above is completed; however, preliminary positions have been proposed in **Figure 3** above:

    - Cores will be sampled and assessed by the on-site geologists and core logs will be maintained.
    - Casing will be removed from the borehole on completion thereof and the borehole sealed in accordance with "Standard Borehole Sealing Procedure" i.e.: each borehole certificated in terms of this procedure. Sealing will include:
        - Removing casing- if casing is to be removed, a specialist borehole contractor will advise on appropriate techniques and associated risks.
        - Backfilling- boreholes should be backfilled with clean uncontaminated material. Backfilled hole should be similar to surrounding strata
        - Seal top of borehole- backfilled borehole should be compiled with an impermeable plug to prevent entry of potentially contaminated surface run-off or other liquids.
        - Record details- the depths and position of each layer of backfilling and sealing material.
    - Existing farm roads and tracks will be utilised as far as possible.
    - The proposed timeframe associated with the invasive prospecting is expected to be no more than 3 years.
    -

- Analytical assessment of prospecting data:
    - Data will be assessed in a pre-feasibility study to determine resource estimates to commence with prefeasibility and feasibility assessments

for mine planning and Mining Right Application processes.

(d)Policy and Legislative Context

This prospecting application is being sought by Thikho Resources as an initial application for exploration and any future mining activities over the listed farm for the extraction of Coal and Pseudo Coal. The legislative summary below is specific for the proposed prospecting activities to which this application relates.

Table 3: Summary of Applicable Legislation

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
National Environmental Management Act, Act 107 of 1998 (NEMA) NEMA Regulation GNR982 – EIA Regulations NEMA Regulation GNR983 – Listing Notice 1 NEMA Regulation GNR807 – PPP guideline NEMA Regulation –GNR 1147 – Financial Provision for Prospecting, Mining, Exploration and Production Operations	This entire report has been compiled in terms of NEMA Basic Assessment (BA) requirements as only GNR983 scheduled activities are triggered – Part A Section 3(c) (i). PPP completed in terms of NEMA regulation – Part A Section 3(g) (ii) and Table 1.	This report forms the BA and EMP Report as required for a BA process under NEMA for an application for EA.
Mineral and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA) and associated Regulation GNR 527.	EMP section of this report (Part B) has included regulation requirements where relevant.	The application for EA is being done in terms of a Prospecting Right (PR) application already submitted to the DMR.
Mine Health and Safety Act, Act 29 of 1996 (MHSA) and associated Regulations	Although not directly addressed in the EMP section of the report, protecting the environment contributes to a safe working environment.	The company will employ a SHE officer to ensure regulation is enforced during prospecting as well as adherence to COP and SOPs. Where these procedures apply to prospecting contractors this will be communicated through induction training.
National Environmental Management: Waste Act (NEM: WA), Act 59 of 2008 as amended and its associated regulations In terms of the Act, all mine residues are listed under the hazardous category in schedule 3 of NEM: WA. NEM: WA Regulation GNR921 – List of Waste Management Activities – consulted but no activities relevant NEM: WA Regulation GN926 – National Norms and Standards for the Storage of Waste NEM: WA Regulation GN 1005 – Proposed regulations regarding the planning and management of residue stockpiles and residue deposits from a prospecting, mining, exploration or production operation	General waste management has been incorporated into Part B, the EMP report. No landfills will be established on site. No mine residue deposits are applicable to this application.	Implement management measures as per the EMP. No Waste Management License required.
National Water Act (NWA), Act 36 of 1998 as amended and its associated regulations GNR704 has been incorporated into storm water management on site where relevant.	The water management plan has been incorporated into Part B, the EMP report.	GN704 regulations will apply, including remaining outside wetlands and their 100m buffer zones and outside river and river buffer zones (100m or 1:100-

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT
		year flood line, whichever is greatest). Applications will be made and approved prior to any activity in these areas.
National Environmental Management: Air Quality Act. Act 39 of 2004 (NEM: AQA) Also deals with noise levels – to be read with Environment Conservation Act, Act 73 of 1989 (ECA) South African National Standard: SANS 10103:2004 – The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication	N/A. Prospecting does not trigger the need for an AEL. Noise management has been incorporated into Part B, the EMP report.	AEL is not applicable. Noise levels will be maintained within baseline levels in the area or to the SANS standards.
National Environmental Management: Biodiversity Act, Act 10 OF 2004 (NEM:BA) Various regulations pertaining to protected species Various regulations pertaining to alien and invasive species – to be read with CARA and regulations NEM:BA Regulation GNR1002 – National list of ecosystems that are threatened and in need of protection Northern Cape Nature Conservation Act, Act 9 of 2009 National Forest Act, Act 84 of 1998	General management regarding protected species and alien and invasive species has been incorporated into Part B, the EMP report.	No listed activities under GNR 985 applicable – no EA required. The company will implement alien invasive management with regards to preventing spread of alien invasive species over areas disturbed by prospecting activities. Protected species will be preserved *in situ* and invasive prospecting will maintain 50m buffer from protected species, or the relevant permits will be applied for destruction or relocation of said species.
National Veld and Forest Fire Act, Act 101 of 1998	General management regarding the training, preparedness and control of fires.	The company will implement firefighting management protocols as stipulated by the NVFFA
National Heritage Resources Act, Act (NHRA), 1999 (Act No. 25 of 1999)	Management measures regarding archaeological artefacts	A desktop heritage assessment has been performed and potential heritage areas have been delineated and buffered. Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and SAHRA KZN province notified in order for an investigation and evaluation of the finding(s) to take place.

(e) Need and desirability of the proposed activities

Whilst the activity of prospecting itself will not directly benefit the surrounding communities or create employment, it will confirm the geology and feasibility of future mining prospects in line with the MPRDA.

Creating employment opportunities and improving social infrastructure are key goals set out in the Emalahleni Local Municipality Integrated Development Plan ("IDP") and the establishment of any future mine would provide job opportunities for unskilled, and potentially skilled, labour from the surrounding areas.

During the prospecting activities, local services (drilling company, laboratory etc.) will be utilised as far as possible.

(f) Motivation for the overall preferred site, activities and technology alternative.

The proposed site was selected based on extensive research on the geology of the area. Furthermore, the proposed site was also available for prospecting (i.e. not held by another company). The preliminary positions of the proposed prospecting boreholes have been sited to give a representative sample for the project area. The positions of these have considered the various water resources, SANBI Critical Biodiversity Areas ("CBA'") and Ecological Support Areas ("ESA"), and any potential heritage buildings, as well as their applicable buffers. Alternatives may be considered based on the findings of the geophysical investigations. In instances where boreholes will have to be situated inside these buffers, the requisite authorisations will be obtained from the DWS.

No activity alternatives are considered. Drilling is still the most effective way and an industry norm to complete resource evaluation as required for the mine works programme to be submitted in terms of a Mining Right Application ("MRA").

The use of aerial geological mapping as an initial non-invasive technique to delimit areas for invasive drilling is seen as the most responsible method to reduce needless surface disturbance and reduce environmental impact footprint. Technological alternatives are therefore also not assessed further.

(g) Full description of the process followed to reach the proposed preferred alternatives within the site.

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

(i) Details of the development footprint alternatives considered.

a) The property on which or location where it is proposed to undertake the activity;

Not applicable. Properties are delimited by the properties available for prospecting (i.e. not held by another company); and the geology of the area.

b) The type of activity to be undertaken;

No activity alternatives are considered. Prospecting is a pre-requisite to mining and is governed by legislative requirements for mining.

c) The design or layout of the activity;

It is possible that no site camp will be erected within the Prospecting area in order to minimise disturbance to the land. The Prospecting Area is approximately 14km South East

of Ogies, therefore accommodation will be sought for in town and land owners will be consulted/negotiated with to use existing barns as storage areas. Areas comprising of shade and seating for meals may be established.

Should a site camp need to be erected it will be positioned near an existing road as it increases accessibility as well as reduce any environmental disturbance associated with the need to create new access roads. Existing farm roads and tracks will be utilised. No additional roads will be constructed. The site camp will consist of storage for drilling equipment and portable ablution facilities.

The preliminary positions of the proposed prospecting boreholes have been sited to give a representative sample for the project area. The positions of these have considered the various water resources, and SANBI Critical Biodiversity Areas ("CBA'"), and Ecological Support Areas ("ESA") and any potential heritage buildings, as well as their applicable buffers. In instances where boreholes will have to be situated inside these buffers, the requisite authorisations will be obtained from the DWS.

d) The technology to be used in the activity;

The use of desktop studies and literature reviews are viewed as an initial non-invasive technique to delimit areas for invasive drilling prospecting and is seen as the most responsible method to reduce needless surface disturbance and reduce the environmental impact footprint. Technology alternatives are therefore also not assessed further.

e) The operational aspects of the activity; and

Drilling is still the most effective way as well as an industry norm to complete resource evaluation as required for the mine works programme to be submitted in terms of a MRA. No further alternatives are relevant.

f) The option of not implementing the activity.

Should the prospecting activities not be granted then the potential reserves may not be defined and ultimately utilised and the opportunity of future economic opportunities and job creation lost.

(ii) Details of the Public Participation Process Followed

The PPP is being conducted in terms of Chapter 6 of the NEMA as well as GNR 807 PP guidelines and has included the following:

1) Identification of key Interested and Affected Parties ("I&APs") (affected and adjacent landowners) and other stakeholders (organs of state and other parties)

2) Placement of site notices on farms, and within a 100m radius

3) Formal notification of the application to key Interested and Affected Parties (all adjacent landowners) and other stakeholders;

4) Consultation and correspondence with I&AP's and Stakeholders and the addressing of their comments;

5) Public meetings at a central accessible location identified by interested and affected parties;

6) Newspaper adverts;

Identification of key Interested and Affected Parties

The principal objective of public participation is to inform and enrich decision-making. This is also a key phase in this Environmental Impact Assessment ("EIA") process.

Land owners (affected and adjacent) were identified through a search conducted via online search engines accessing the Title Deed office database. In addition to land owners, other relevant organisations where identified and notified of the application. This includes Municipal and Government Departments with jurisdiction in the project area and Non-Governmental Organisations (NGOs) with an interest. I&AP's representing the following sectors of society were identified:

- National, provincial and local government;
- Agriculture, including local landowners;
- Community Based Organisations
- Non-Governmental Organisations;
- Department of Water and Sanitation
- Industry and Mining;
- Other stakeholders

(iii) Summary of issues raised by I&APs

(Section will be filled in upon completion of Public Participation)

(iv) The Environmental attributes associated with the sites

(1) Baseline Environment

The following information was obtained from the Nooitgedacht PWP, the NEMA application, and a general desktop assessment of the site and surrounding areas. Spatial information was obtained from the Emalahleni Local Municipality's IDP and SDF. Statistical data was obtained from the StatsSA website. SANBI GIS tool was used to look into the sensitivities of the site. A site visit confirmed the findings of the desktop assessment.

a) Type of environment affected by the proposed activity.

Geology:

The Witbank coalfield is, historically, the most important coal-producing region in South Africa. Bituminous coal is hosted in the Permian Vryheid Formation (Karoo Supergroup) and five coal seams exist in the region, although not all are economically exploitable.

The coal seams are numbered from 1 at the bottom to5 at the top. The distribution of the Nos. 1 and 2 Seams is determined by the pre-Karoo topography, while the Nos. 4 and 5 Seams extent is controlled by the present-day surface. Dykes and sills devolatilize the coal and displace the seams if present.

The basin is a multiple seam deposit type with the development of five major seam horizons which may in places be composite seams. The major controls for the development of the coal are proximity to undulations of the "basement" topography, through erosion channeling and sediment influx into swamp beds and finally erosion of the current erosion surface. The primary economic coal seams have been the No. 2 Seam and No. 4 Lower Seam and, in places, the No. 5 Seam. Structurally, the coal horizons are un-deformed with each displaying a very slight dip to the south east of less. There are a number of active coal mines surrounding the prospecting area which is a good indication that the selected properties will be prospective.

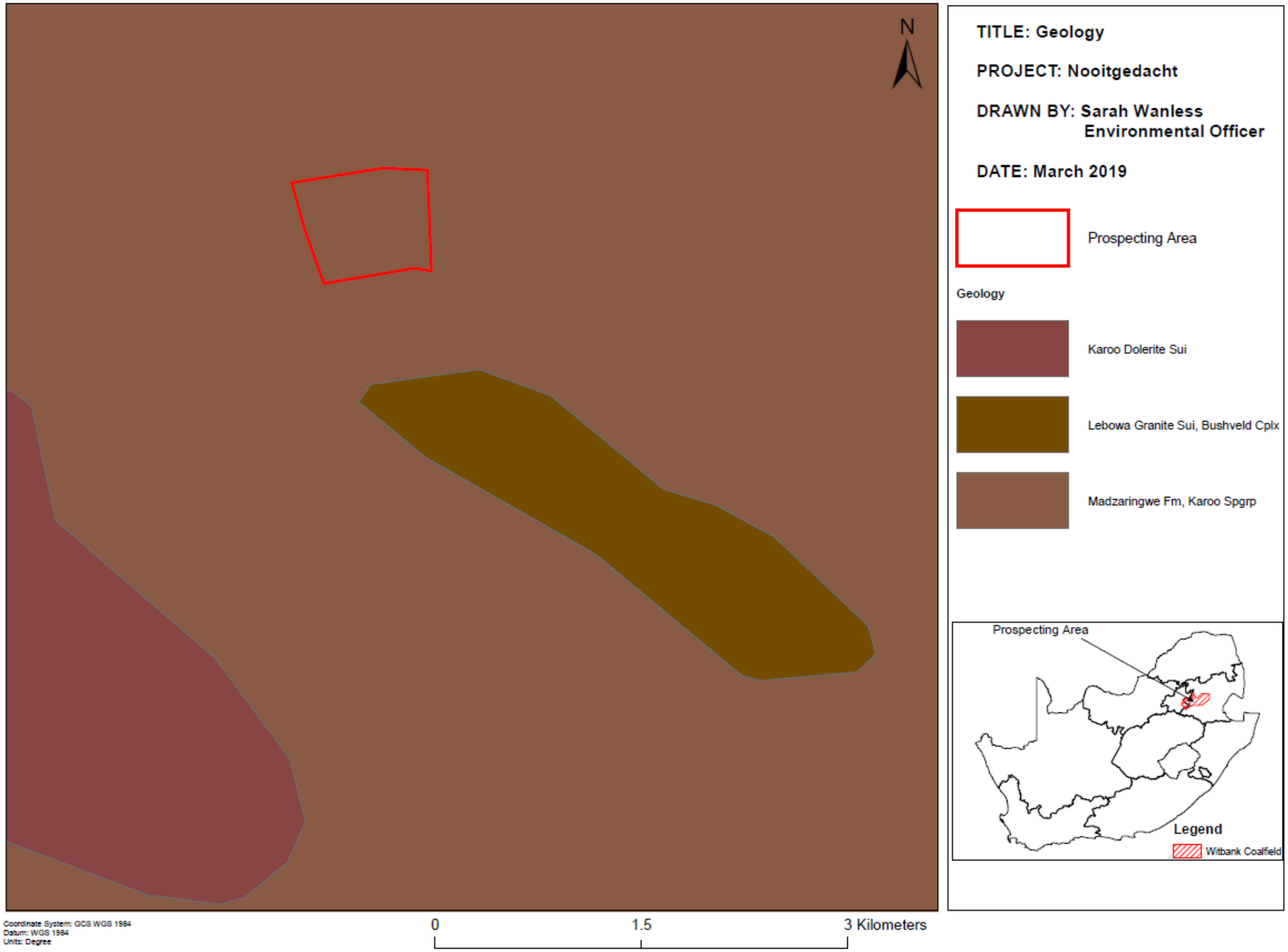


Figure 4 Geology Map

Climate:

In Ogies, the climate is warm and temperate. When compared with winter, the summers have much more rainfall. The climate here is classified as Cwb, Temperate with cold, dry winters and warm, wet summers, by the Köppen-Geiger climate classification system. The average annual temperature is 15.5 °C. About 693 mm of precipitation falls annually. The driest month is June. There is 7 mm of precipitation in June. In January, the precipitation reaches its peak, with an average of 124 mm

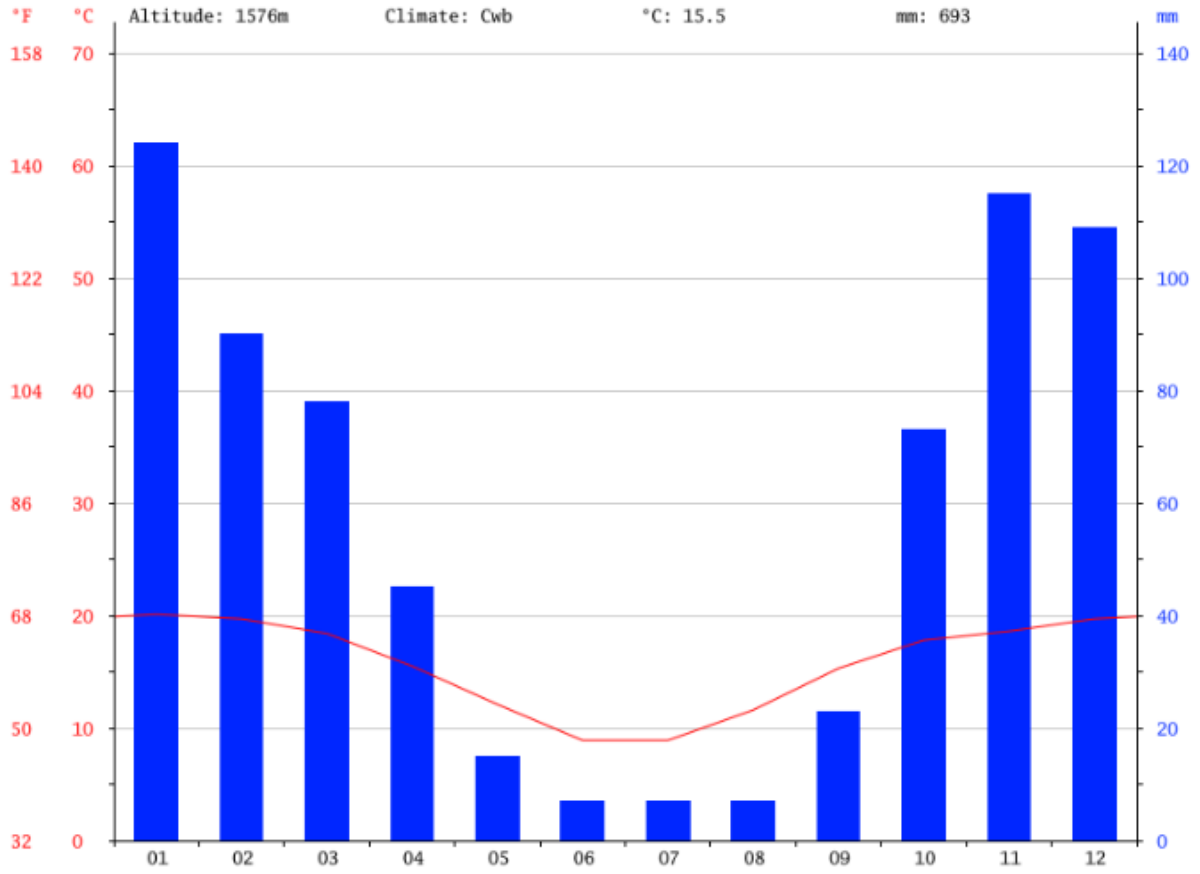


Figure 5 Climate Graph for Ogies

Topography:

The area associated with the proposed prospecting area is characterized as having flat/slightly undulating areas. There are no extreme and/or extraordinary topographical features present as seen in **Figure 6** below.

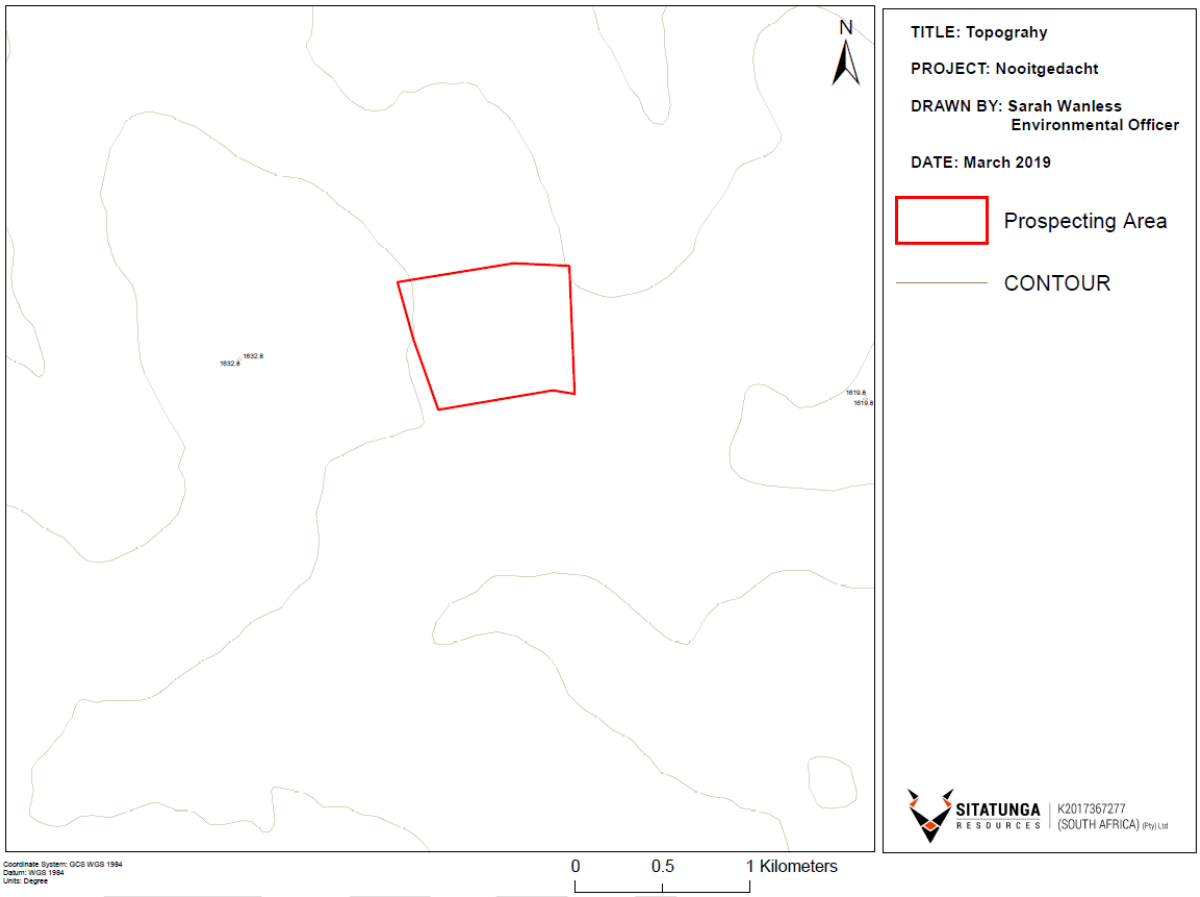


Figure 6 Topographical Profile of Site

Soils & Land Capability:

The land capability has not been described specifically for the area as the impact of prospecting will not significantly affect the land capability of the area. Land use in and around the prospecting area is mainly cultivation and natural lands. The proposed prospecting area is associated with grasslands and agricultural activities.

The land Capability for the Prospecting Area was determined using the EIA Screening Tool and is characterized as being “High” in terms of Agriculture Theme Sensitivity (**Figure 6** and **Table 4** below).

Figure 7 Agriculture Combined Sensitivity (EIA Screening Report)

Table 4 Agricultural Sensitivity

Sensitivity	Feature(s)
High	Land capability;09. Moderate-High/10. Moderate-High
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
High	Annual Crop Cultivation / Planted Pastures Rotation;Land capability;09. Moderate-High/10. Moderate-High
High	Old Fields;Land capability;09. Moderate-High/10. Moderate-High
High	Old Fields;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
High	Old Fields;Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
High	Subsistence Farming 1;Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
High	Subsistence Farming 1;Land capability;09. Moderate-High/10. Moderate-High
High	Subsistence Farming 1;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
Very High	Pivot Irrigation;Land capability;09. Moderate-High/10. Moderate-High
Very High	Pivot Irrigation;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

Natural vegetation:

The prospecting area is situated in the grassland biome. The grassland biome, occupying 26% of South Africa, is centrally located in the country. Environmental gradients exist, causing the floristic composition, vegetation dynamics and ecosystem functioning to vary

considerably across this biome, despite the relatively uniform vegetation structure. These gradients include a rainfall gradient ranging from 400 to >1200 mm per year, a temperature gradient from frost free to snow in winter and altitude ranging from sea level to 3300 m (O'Connor & Bredenkamp 2003). Grasslands are important to the livestock industry, and agricultural scientists historically produced considerable research on this biome

Fauna:

The fauna expected observed in the study area are, for the most part, typical grassland species and representative of grassland animal communities that are widespread in the regional areas. Protected mammal species such as Serval (*Felis serval*) and other small mammals are highly likely to occur within the project area and surrounds. Faunal Species of Conservation Concern ("SCC") are expected to occur within the region in and around the study area, therefore should any prospecting activities take place, care should be taken to minimise habitat disturbance and avoid collision with this specie during invasive prospecting activities.

Surface water:

The proposed project site is situated within the Olifants Catchment Area, within the B11F quaternary catchment area. According to NFEPA wetland Data there is surface water within the prospecting area. This will be verified during the site visit.

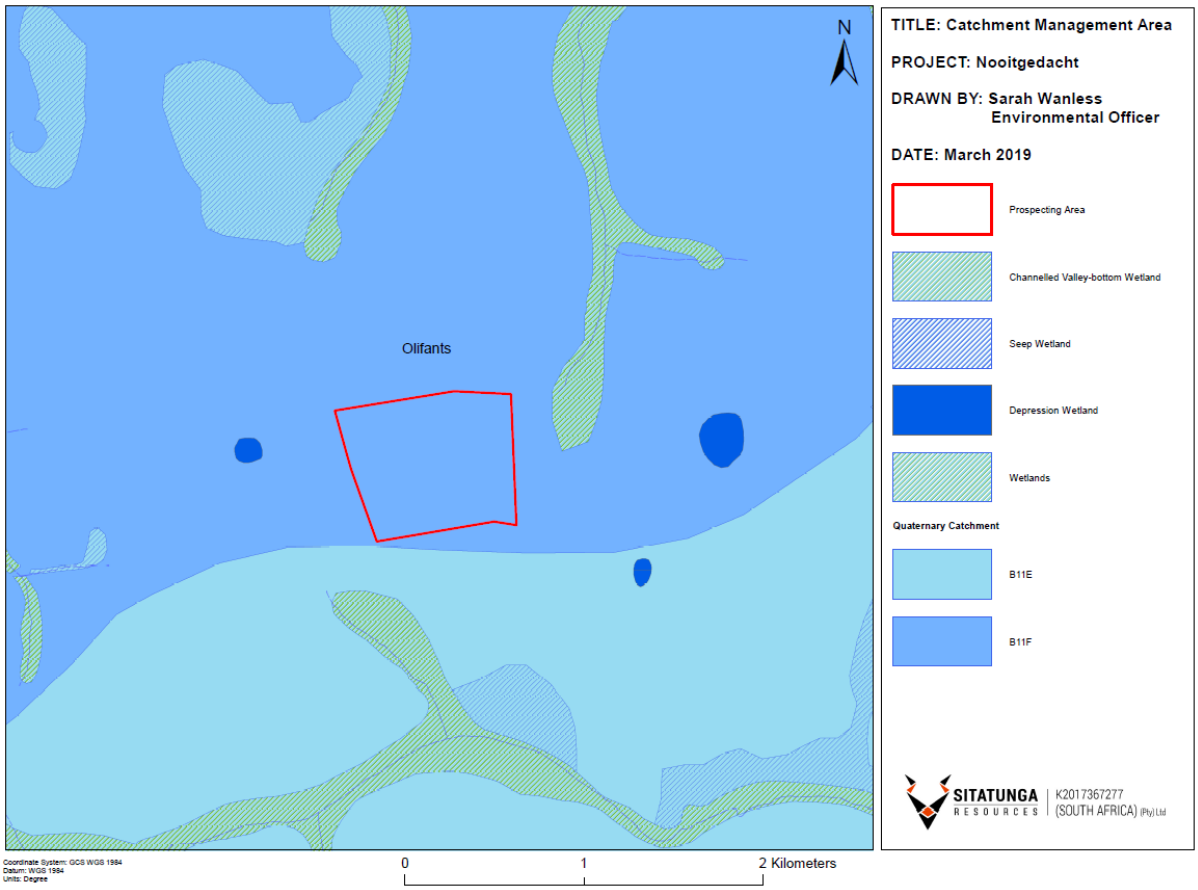


Figure 8 Catchment Management Area

Groundwater:

There is a data deficiency for groundwater studies in the area, therefore the exact status of groundwater availability is not known. Groundwater is an essential resource for rural and farming communities for consumption, agriculture and other domestic purposes.

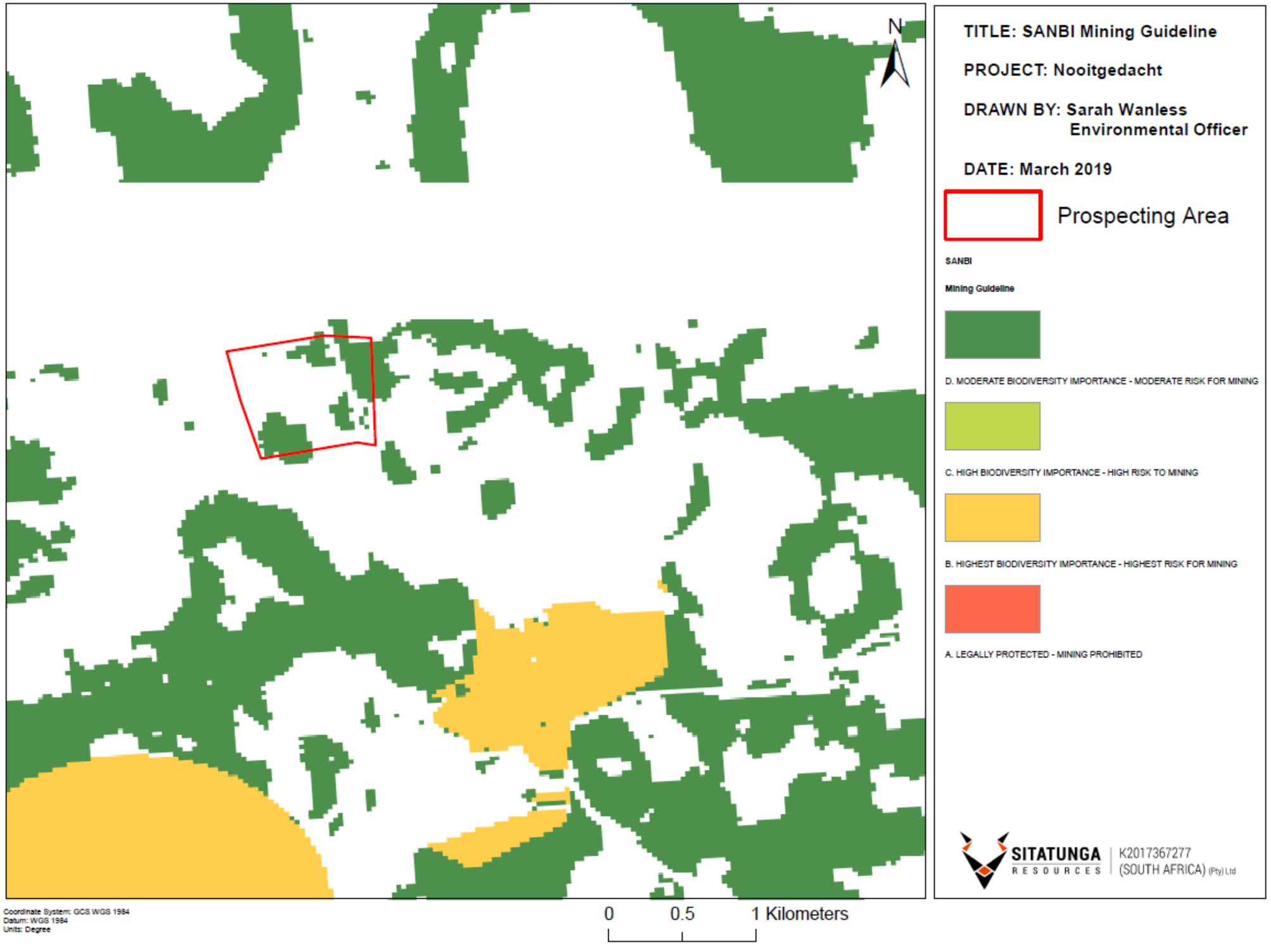


Figure 9 SANBI Mining Guidelines

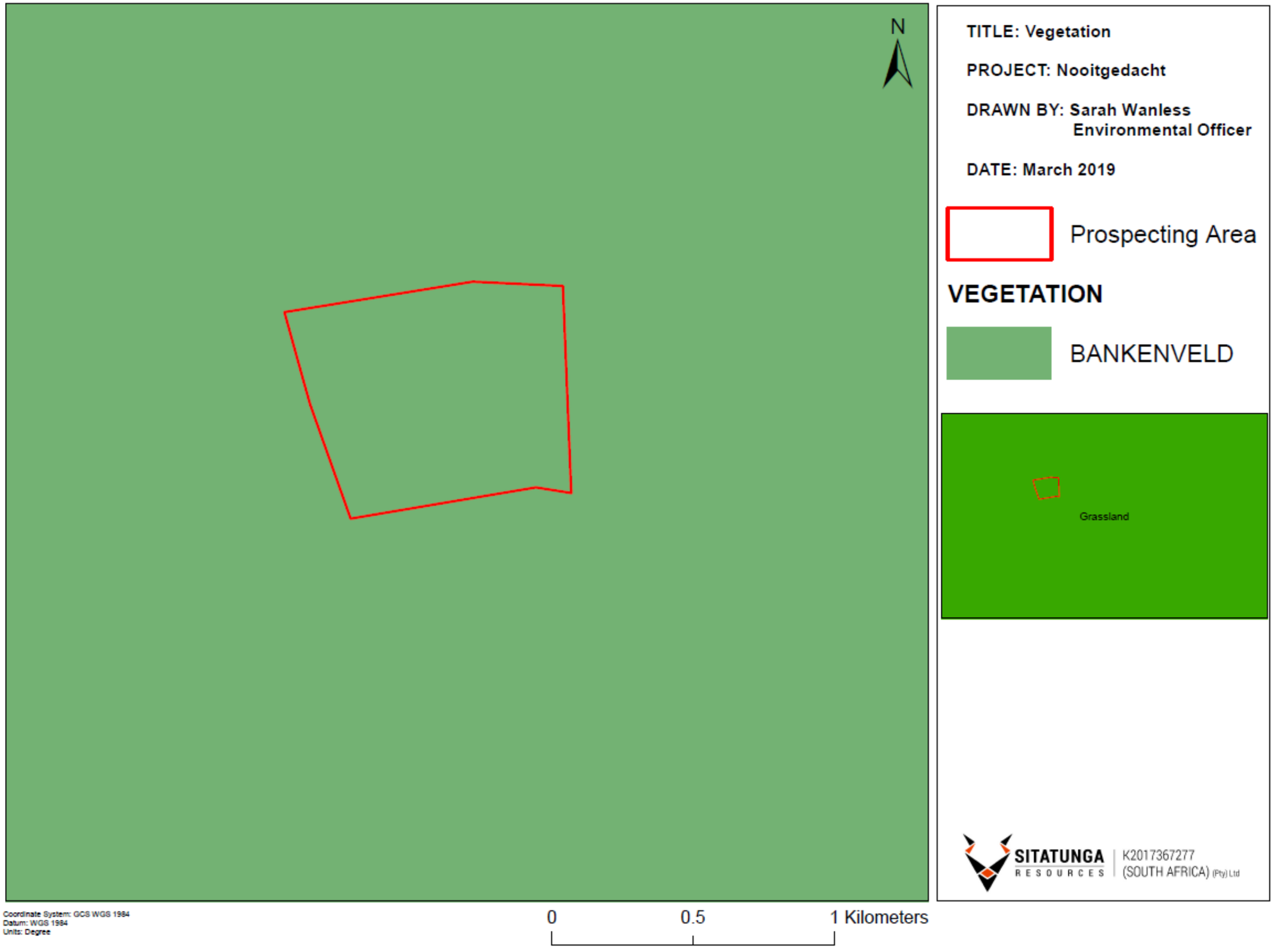


Figure 10 Vegetation Map

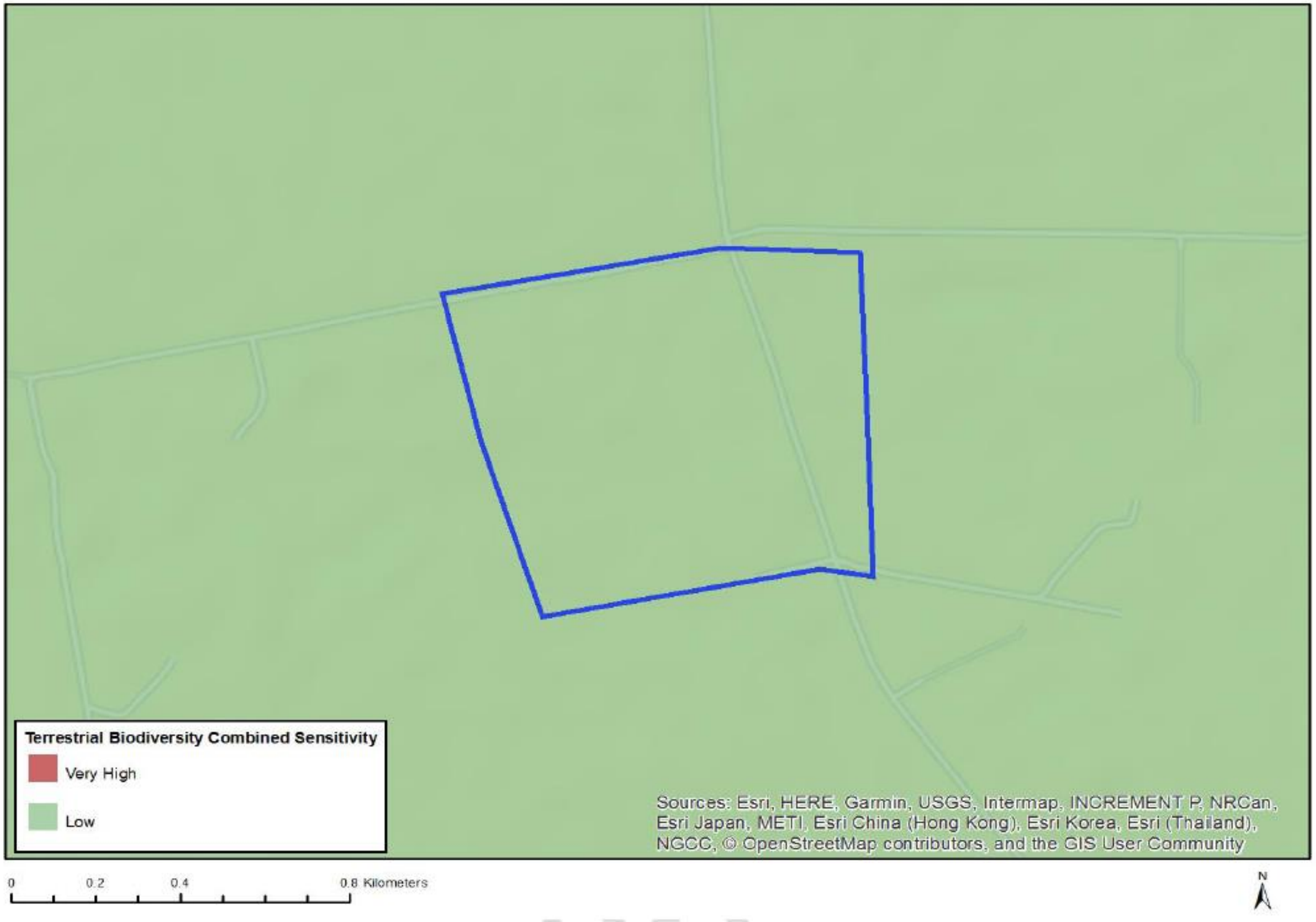


Figure 11 MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

Sites of archaeological and cultural interest:

According to the DEA screening tool the sites archaeological and cultural heritage combined sensitivity is medium. Should any heritage sites be found or noted during the prospecting activities, a 50m buffer will be applied and no invasive prospecting will occur within these buffer zones unless a permit is obtained to do so.

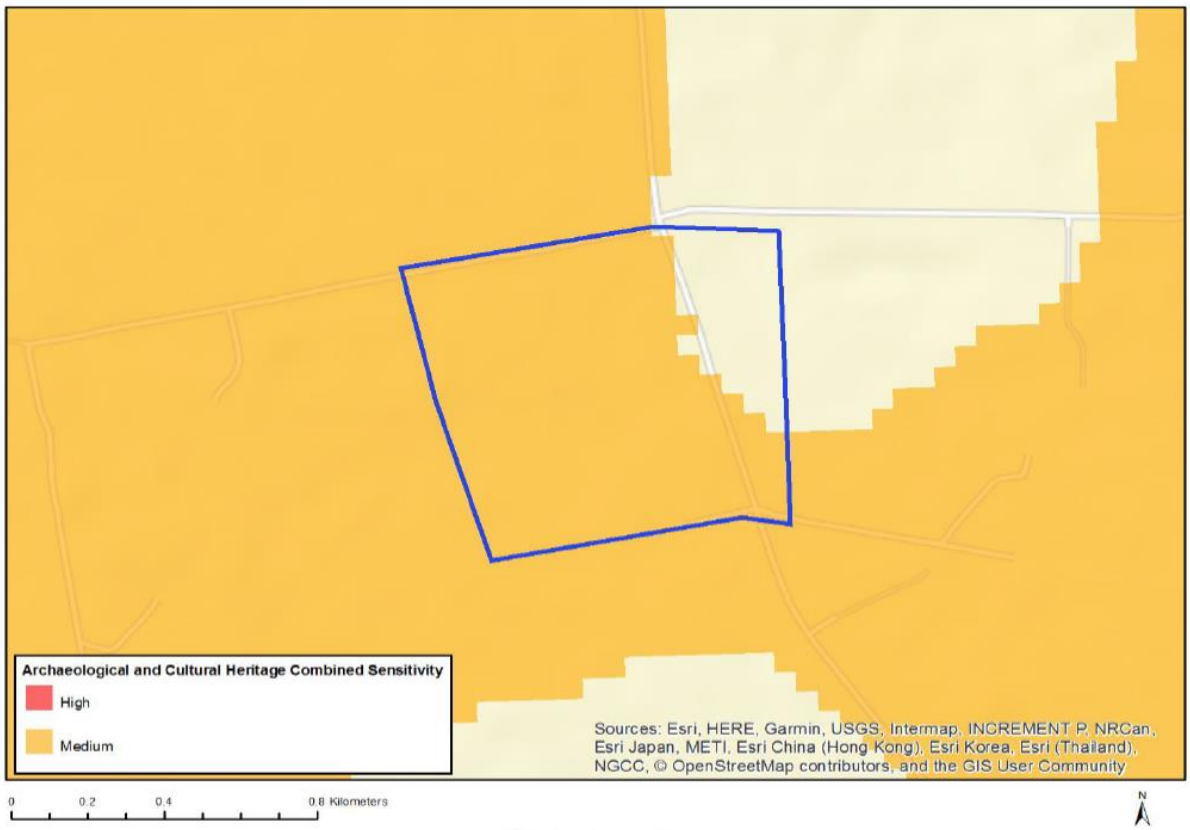


Figure 13 Archaeological and Cultural Heritage Combined Sensitivity

Regional Context:

Emalahleni Municipality (MP305) is one of three local municipalities within Nkangala District Municipality. eMalahleni is a Nguni name meaning place of coal. The Emalahleni Municipality is strategically located in terms of the provincial context and transport network. It is situated in close proximity to the City of Ekurhuleni, City of Johannesburg and City of Tshwane Metropolitan Municipalities in Gauteng, and is connected to these areas by the N4 and N12 freeways. These freeways converge at eMalahleni (previously Witbank) in Emalahleni, from where the N4 extends to Mbombela (previously Nelspruit), the provincial capital, and ultimately Maputo in Mozambique. The N4 freeway, along with the railway line that runs adjacent to the freeway from Gauteng to Mozambique, constitute the Maputo Corridor.

The southern areas of the Emalahleni Municipality form part of the region referred to as the Energy Mecca of South Africa, due to its rich deposits of coal reserves and power stations. eMalahleni and Middelburg (situated in the adjacent Steve Tshwete Municipality)

are the highest order settlements in the Nkangala District. These towns offer the full spectrum of business and social activities, and both towns have large industrial areas. The towns fulfil the function of service centres to the smaller towns and settlements, as well as farms in the district.

Location, Population and distribution:

In 2011, Emalahleni's population was approximated at a total 395 466 people. According to the 2016 community survey, the total population in the municipality was recorded at approximately 455 227 people. According to the Census 2011 data, the number of households in Emalahleni was 119,874, which increased by 30 545 households to 150 419 households in 2016. This indicates that as the number of households increase so does the average number of households. This is could be a result of in migration into the area due to job transfers or a new dwelling for the household.

According to the Statistics South Africa 2016 Community Survey data, the age structure of the population reveals a generally young population (**Figure 12**) with a large portion falling below the age of 39. The needs of this generally young population thus become important and it has implications on the provision of educational facilities, social welfare and the stimulation of the economy to provide job opportunities and economic development for the economically active portion of the population.

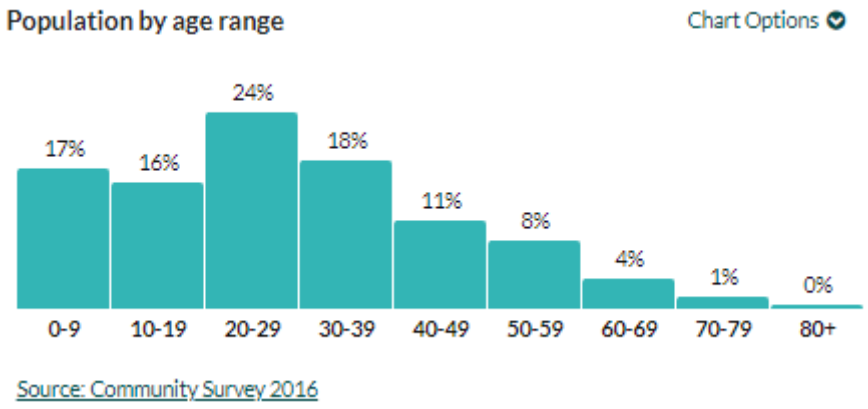


Figure 12 Age Distribution (2016 community survey)

Major economic activities and sources of employment:

A socio-economic profile of the municipality is very critical in assisting a municipality with how to plan and properly utilise its resources. It also assists developers in identifying gaps in the local municipality and where their focus should be in terms of social responsibility projects. A socio-economic profile is an important tool that provides data on three primary areas of concern, ie. Social Services, Economic Services and Spatial/Development. The major economic activities for the local municipality are as follows; Mining, power generation,

coal, steel, vanadium and chrome

Employment

Emalahleni's economically inactive population contributes approximately 27.3% of the total population within the municipality. The Census 2011 data further reveals that a large portion, approximately 190 662 people, of the municipality's population is employed. Unemployment within the municipality was recorded at 27%. This indicates that municipality is facing challenges in the generation of employment opportunities and a possible lack of necessary skills and education to participate in the economy may be lacking within the municipality

b) Description of the current land uses.

The proposed prospecting site and its surroundings are predominately rural, with undisturbed natural areas and agricultural, dryland irrigation. There are lots of waterbodies on site consisting of natural and artificial wetlands as well as the sand spruit River The current land uses will not be altered during prospecting, and these can continue alongside exploration activities.

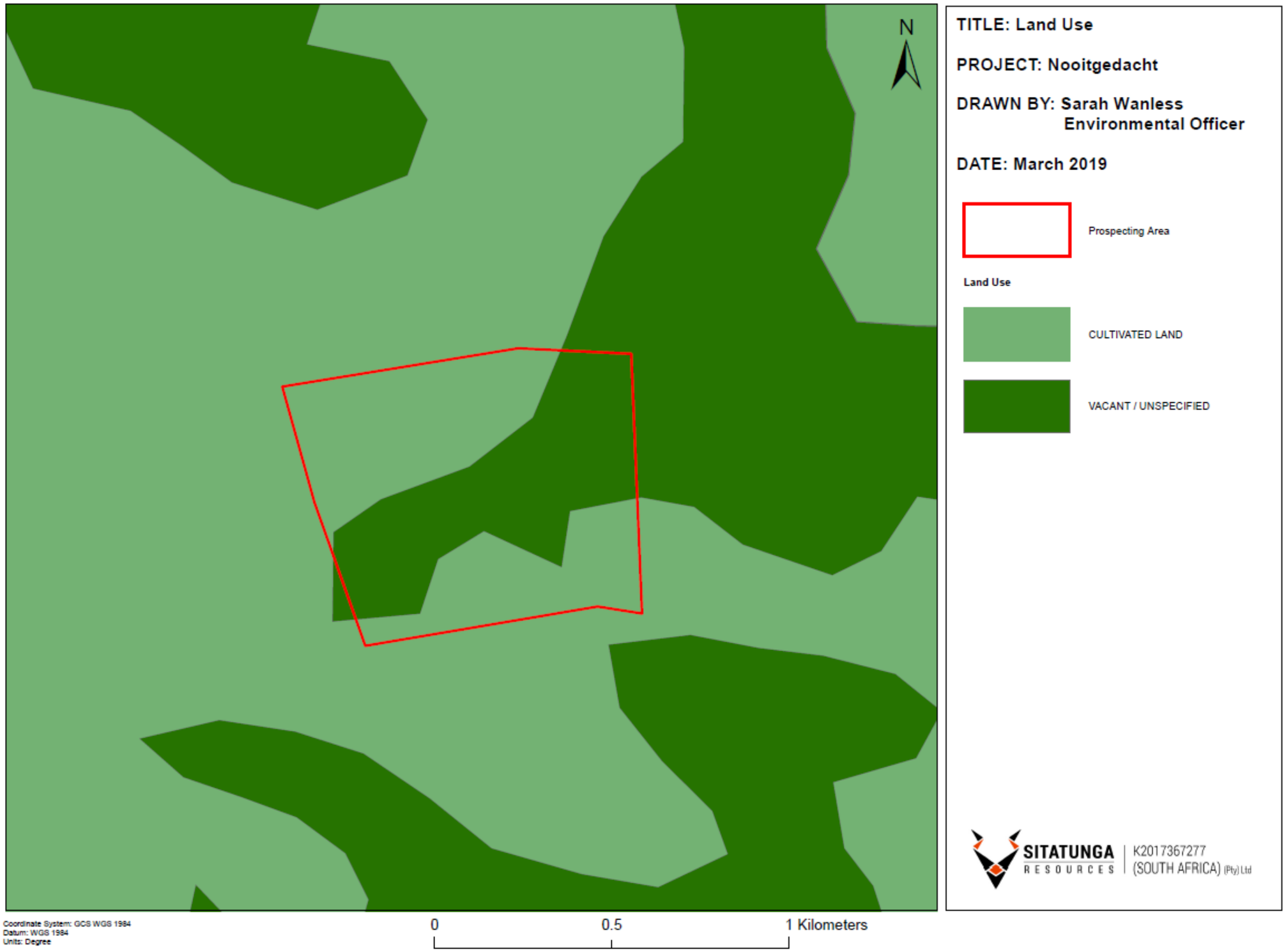
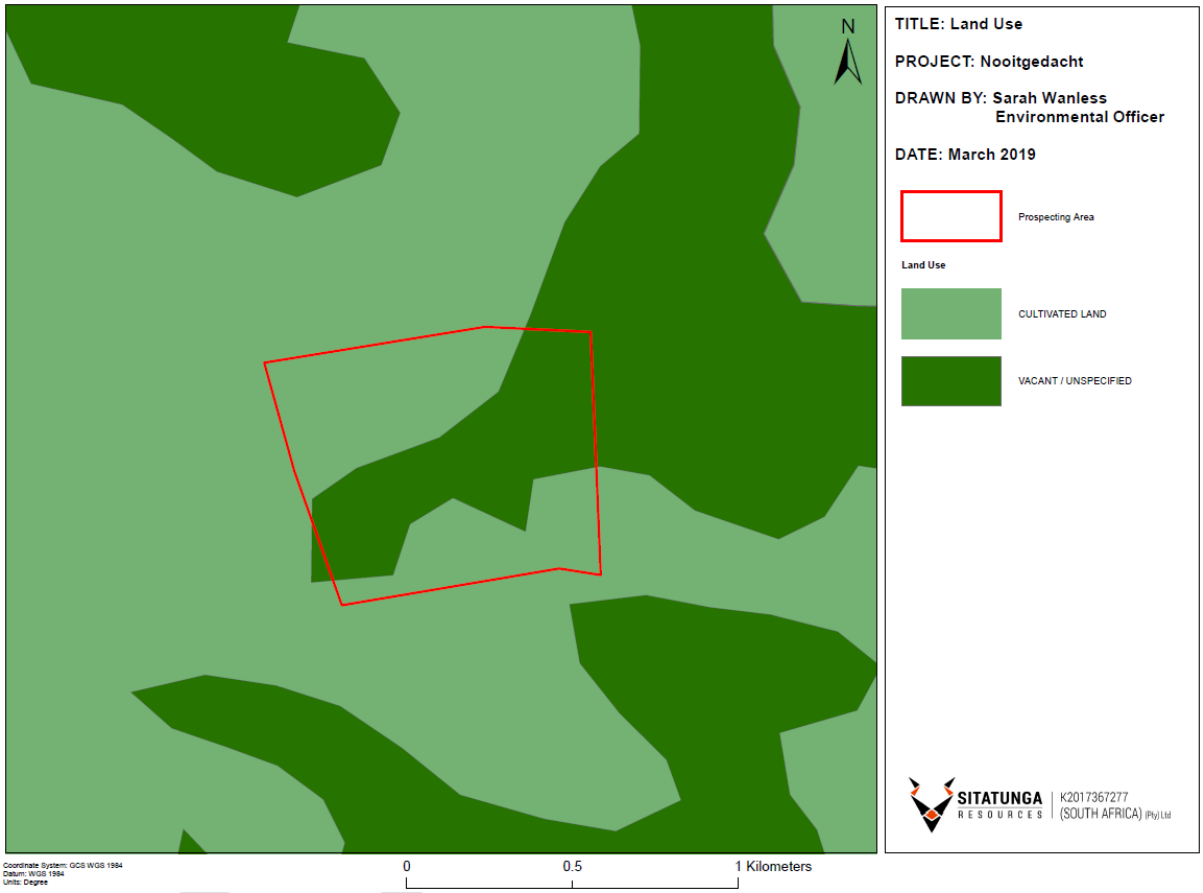


Figure 13 Land Use Map

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

Prospecting will allow for enough flexibility in drilling to avoid sensitive landscapes such as rivers, wetlands and associated buffer zones. If there is a need to conduct activities in any of these areas then the necessary applications will be sought and approved prior to conducting activities in these areas. In instances where boreholes will have to be situated inside these buffers, the requisite authorisations will be obtained from the DWS.

d) Environmental and current land use map.



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

See Appendix 3 for Impact Table

(vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

The full methodology utilised is described below. Impact assessment methods were developed to: (1) identify the potential impacts of a proposed development on the social and natural environment; (2) predict the probability of these impacts and (3) evaluate the significance of the potential impacts. The methodology used is as follows:

The status of the impact	
Status	Description
Positive:	a benefit to the holistic environment
Negative:	a cost to the holistic environment
Neutral:	no cost or benefit

The duration of the impact		
Score	Duration	Description
1	Short term	Less than 2 years
2	Short to medium term	2 – 5 years
3	Medium term	6 – 25 years
4	Long term	26 – 45 years
5	Permanent	46 years or more

The extent of the impact		
Score	Extent	Description
1	Site specific	Within the site boundary
2	Local	Affects immediate surrounding areas
3	Regional	Extends substantially beyond the site boundary
4	Provincial	Extends to almost entire province or larger region
5	National	Affects country or possibly world

The reversibility of the impact		
Score	Reversibility	Description
1	Completely reversible	Reverses with minimal rehabilitation & negligible residual affects
3	Reversible	Requires mitigation and rehabilitation to ensure reversibility
5	Irreversible	Cannot be rehabilitated completely/rehabilitation not viable

The magnitude (severe or beneficial) of the impact		
Score	Severe/beneficial effect	Description
1	Slight	Little effect - negligible disturbance/benefit
2	Slight to moderate	Effects observable - environmental impacts reversible with time
3	Moderate	Effects observable - impacts reversible with rehabilitation
4	Moderate to high	Extensive effects - irreversible alteration to the environment
5	High	Extensive permanent effects with irreversible alteration

The probability of the impact		
Score	Rating	Description
1	Unlikely	Less than 15% sure of an impact occurring

2	Possible	Between 15% and 40% sure of an impact occurring
3	Probable	Between 40% and 60% sure that the impact will occur
4	Highly Probable	Between 60% and 85% sure that the impact will occur
5	Definite	Over 85% sure that the impact will occur
The Consequence		= Magnitude + Spatial Scale + Duration + Reversibility.
The Significance		= Consequence x Probability.

The rating is described as follows:

Score out of 100	Significance
1 to 20	Low
21 to 40	Moderate to Low
41 to 60	Moderate
61 to 80	Moderate to high
81 to 100	High

Will mitigation be possible (yes or no)?

Finally, the negative impacts are rated according to the degree of loss of a resource due to the particular impact. This is only assessed from the pre-mitigation perspective of the impact. The degree of loss of a resource is evaluated in terms of:

- Low degree of loss: where the resource will recover on its own with no/limited rehabilitation over an observable period of time;
- Moderate degree of loss: where the resource will recover over extended period or with rehabilitation or remedial measures to assist recovery of resource; and
- High degree of loss: Where the resource cannot be recovered, or the resource will recover over extended time periods.

Final Impact Tables are attached as ***Appendix 3.***

(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

Table 5 Advantages and Disadvantages of Alternatives

	Location A	*Location B*
Disadvantages:	1. A 100m buffer is allocated to the national road that runs through sire and no drilling will	

	occur within this buffer	
Advantages:	1. Existing Farm roads will be utilized as far as possible. 2. Contractor accommodation will be sought offsite as Ogies is only 14km away 3. Existing farm buildings may be utilized for storage. 4. From google earth areas within the project site look like they have already been largely degraded	
Site Motivation:		No site alternatives have been considered. This is the only site that is available to the applicant and no other prospecting right applications have been lodged for the site. As this application is only at prospecting phase and any phase one studies have yet to be conducted, the placement of the boreholes is yet to be finalized. Prospecting activities are limited to the Prospecting Area and, as such, location alternatives are limited. Any areas that are of biodiversity importance will be avoided where possible and rehabilitated where avoidance is not an option. As this application is only at the prospecting stage the impacts will be small scale, are generally well known and will be rehabilitated back to its initial condition as far as possible.

a) Location A Map:

(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).

Table 6 Proposed project Layout and Advantages and Disadvantages of Alternatives Suggested by I&APs

Alternatives	Advantages	Disadvantages
Final proposed project layout		
There are currently no suggested alternative layouts by Interested and Affected Parties		
Other alternatives proposed by I&APs		

Table 7 Possible Mitigation measures to issues raised by I&APs

Issue raised	Mitigation measures considered including alternatives	Risks associated with proposed mitigation measure
No Issues have been raised as yet	No Issues have been raised as yet	N/A

(ix) Motivation where no alternative sites were considered.

With regard to location, the prospecting activities are delimited by the properties available for prospecting (i.e. not held by another company) and the geology of the surrounding area.

The preliminary positions of the proposed prospecting boreholes have been sited to give a representative sample for the project area. The positions of these have considered the various water resources and their applicable buffers. Alternatives may be considered based on the findings of the geophysical investigations. In instances where boreholes will have to be situated inside these buffers, the requisite authorisations will be obtained from the DWS.

No activity alternatives are considered. Drilling is still the most effective way and an industry norm to complete resource evaluation as required for the mine works programme to be submitted in terms of a MRA.

The use of desktop study and literature review as an initial non-invasive technique to delimit areas for invasive drilling is seen as the most responsible method to reduce needless surface disturbance and reduce environmental impact footprint. Technology alternatives are

therefore also not assessed further.

(x) Statement motivating the alternative development location within the overall site.

The final layout of the drilling can only be completed once the non-invasive activities have been undertaken. It can only be stated that invasive prospecting (drilling) will avoid wetlands and, rivers and 100m buffer zones / 1:100-year floodlines (whichever is greatest), where possible, boreholes will be placed outside of ESAs and CBAs, 50m buffer zones from potential historical sites, graves and identified protected plants. In instances where boreholes will have to be situated inside these buffers, the requisite authorisations will be obtained from the DWS.

(h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

(Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

The impact identification process commenced by identifying all environmental aspects on site, whether sensitive or not. General environmental aspects that were considered include:

- Topography
- Geology
- Soil & Associated Land Capability
- Surface Water, Associated Wetlands and Aquatic Ecosystems
- Groundwater
- Floral and Faunal Ecosystems
- Air Quality
- Ambient Environmental Noise
- Archaeological and Cultural Sites
- Local Traffic and Safety
- Socio-Economics
- Health and Safety

All potential impacts that may occur to the various environmental aspects as a result of the activities listed in Part A Section 3(c) (i) of this report were listed for each of the aspects.

To keep, as far as possible, water of differing qualities separates within the prospecting area, so as to minimise the contamination of clean run-off and surface water.

Through the PPP, any issues or potential impacts identified by the I&APs will be added to the list of potential impacts.

All these impacts will then be assessed as per the methodology described above and their significance determined.

Impact identification has therefore been a consolidated approach based on professional experience, desktop studies and I&AP (including organs of state involved in the PPP) input.

(i) Assessment of each identified potentially significant impact and risk

Table 8 Assessment of each identified significant impact risk

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Access routes	Potential for compaction of soils. Potential hydrocarbon contamination of soil. Potential for damage of any red data flora or heritage sites via the use of unauthorised off road routes Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately. Potential hydrocarbon contamination through contaminated runoff. Potential hydrocarbon contamination seeping to the groundwater environment. Generation of dust on gravel roads. Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles. Increased noise levels. Increased potential for road incidences. Road degradation. Road Accidents	Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems Groundwater Air Quality Noise Traffic & Safety Flora Heritage sites Community	Operation, Decommissioning	Mostly impacts are of moderate to low significance. Most significant impact would be to wetlands if routes are not properly planned and assessed. The impact is of moderate significance.	REMEDY THROUGH: Ripping compacted soils. Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. Surveying any off-road routes prior to use to prevent damage to red data plants and heritage sites CONTROL THROUGH: Remaining in designated roads / routes / activity areas. Maintaining all vehicles, equipment, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubrication Equipping vehicles on site with drip trays to place under leaky equipment. Dust alleviation by spraying and limiting speeds on dirt roads Noise control measures on noisy equipment. Regular communication with nearby I&APs. Surveying any off-road routes prior to use to prevent damage to red data plants and heritage sites STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Traffic control measures to be implemented to limit possibilities of road accidents.	Significance can mostly be reduced to low; or moderate to low through proposed mitigation measures.
Drilling	Localised dips in topography if boreholes collapse after material is replaced. Cracks and disruption to geological layers. Potential for compaction of soils. Potential hydrocarbon contamination of soils. Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately. Potential hydrocarbon contamination through contaminated runoff. Irresponsible use of water and water wastage. Cracks and disruption to aquifers. Potential hydrocarbon contamination seeping to the groundwater environment. Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles. Increased noise levels. Loss of and disturbance to archaeological / heritage / grave sites that may be encountered	Topography Geology Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems Groundwater Air Quality Noise Archaeological/Cultural Sites	Operation, Decommissioning, Closure	Mostly impacts are of low significance. Most significant impact would be to wetlands (moderate to high significance) if sites are not properly planned to avoid these sites.	REMEDY THROUGH: Ripping compacted soils. Lining sumps with the appropriate lining system. Using biodegradable fluids/polymers. Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. Isolate porous or highly transmissive groundwater zones through capping or grouting to prevent clean groundwater ingress or recharge of contaminated water. CONTROL THROUGH: Planning invasive prospecting sites properly to avoid sensitive features. Remaining in designated roads / routes / prospecting areas. Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubricant Placing drip trays under leaky equipment. Dust alleviation by spraying and limiting speeds on dirt roads. Noise control measures on noisy equipment. Responsible water use. Regular communication with nearby I&APs. Contracting necessary specialists as needed. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Limit development to target rocks and reduce exposure of aquifer rocks. Preventing activities near potential heritage sites unless necessary permits are obtained to do so. Maintaining a buffer around the ruins/graves at all times during the prospecting activities	Significance can mostly be reduced to low or moderate to low through proposed mitigation measures.
Casing of boreholes	Localised dips in topography if boreholes collapse after material is replaced.	Topography		Impact significance is moderate to low.	REMEDY THROUGH: Rehabilitating and repairing any damage.	Impact significance is low.

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
					Inspection and immediate action.	
Ablution facility (portable toilets)	Potential contamination of soil with sewage. Potential contamination of surface water bodies with sewage.	Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems	Operation	Impact significance is low.	REMEDY THROUGH: Inspection and repair / replacement of damaged toilets. CONTROL THROUGH: Toilets will not be placed within 100m from any surface water body Contracting necessary reputable contractor to manage portable toilets. Proper housekeeping and hygienic practices. Inspection and immediate action.	Impact significance is low.
Temporary core/equipment store and site office; comprising of shade and seating for meals may be established. Staff will be accommodated in town.	Potential of compaction of soils Potential hydrocarbon contamination of soil. Potential hydrocarbon contamination through contaminated runoff. Potential hydrocarbon contamination seeping to the groundwater environment Alienation of, and disturbance to, animals. Potential contamination of soil with indiscriminately dumped waste or littering. Potential contamination of surface water features with indiscriminately dumped waste or littering. Disturbance/damage to vegetation	Soil & Land Capability Surface Water & Associated Wetlands and Aquatic Ecosystems Groundwater Fauna Flora	Operation, Decommissioning, Closure	Impact significance is generally low to moderate	REMEDY THROUGH: Ripping up of compacted soils Clearing all litter and waste. Removal of alien and invasive species that may establish around prospecting sites. Relocating protected species for which permits are obtained rather than destroying species. Reporting any non-compliant incidences to the relevant authorities and following their requirements. Inspection and immediate action. CONTROL THROUGH: Collecting waste for disposal to the relevant waste stream at the PA. Clear all vehicles coming to site of any vegetative material. Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm or trap animals. Noise control measures. Visually surveying prospecting sites for any protected species or heritage sites. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, audits, entrances or any other openings. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so. Correct Storm Water Management	Impact significance is low
Hydrocarbon Storage	Potential hydrocarbon contamination of soil. Potential hydrocarbon contamination through contaminated runoff. Potential hydrocarbon contamination seeping to the groundwater environment	Soil & Land Capability Surface Water & Associated Wetlands and Aquatic Ecosystems Groundwater	Operation, Decommissioning, Closure	Mostly impacts are of low significance. Most significant impact would be to wetlands (moderate to high significance) if sites are not properly planned to avoid these sites.	REMEDY THROUGH: Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubricant Placing drip trays under leaky equipment. The area is less than 80m^2 Plastic lining will be used Spill kits will be on hand in the event of a spillage Safe work procedure will be adhered to when refuelling vehicles and machinery Every person in control of the prospecting activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into prospecting works, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings.	Impact significance is low
Rehabilitation of boreholes	Topographical nature of the area will be restored through rehabilitation.	Topography Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems	Operation, Decommissioning, Closure	Impact significance is moderate to low.	No mitigation necessary. Impact is positive.	Impact significance is moderate to low.
General overall prospecting	Potential contamination of soil with indiscriminately	Soil & Land Capability	Operation,	Impact significance	REMEDY THROUGH:	Impact significance

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
activities	dumped waste or littering. Potential contamination of surface water features with indiscriminately dumped waste or littering. Potential contamination of groundwater through seepage from indiscriminately dumped waste or litter. Alien invasive encroachment. Alienation of, and disturbance to, animals.	Surface Water & Associated Wetlands & Aquatic Ecosystems Groundwater Flora & Fauna	Decommissioning, Closure	is generally low	Clearing all litter and waste. Removal of alien and invasive species that may establish around prospecting sites. Relocating protected species for which permits are obtained rather than destroying species. Reporting any non-compliant incidences to the relevant authorities and following their requirements. Inspection and immediate action. CONTROL THROUGH: Collecting waste for disposal to the relevant waste stream at the PA. Clear all vehicles coming to site of any vegetative material. Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm or trap animals. Noise control measures. Visually surveying prospecting sites and proposed routes for any protected species or heritage sites before bringing drill rigs to drilling sites. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so.	can be mitigated to be of low significance.
General overall prospecting activities	Potential for more employment & multiplier effect. Fire hazards which could destroy vegetation and fragment habitat for fauna	Socio-economic, Health & Safety Flora and Fauna	Operation	Impact significance is moderate to low.	CONTROL THROUGH: Ensuring fire extinguishers are available on site and staff members are trained on their use. STOP: No open fires should be allowed on site. Designate smoking areas.	Impact significance is moderate to low.
General overall prospecting activities	Theft and safety risks to surrounding landowners	Socio-economic and Health & Safety	Operation	Impact significance is moderate to high	CONTROL THROUGH: Ensuring farm gates are closed at all times. STOP: No employees will be allowed to stay over on site after working hours. No employee will be allowed to loiter around farms	Impact significance is moderate to low.

(j) Summary of specialist reports

Table 9 Summary of Specialists Reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

(k) Environmental impact statement

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

Due to the location of the Prospecting Area the cumulative noise and visual impacts are rated with a moderate to low significance.

The significance of ground water contamination is low to moderate and overuse/irresponsible use of water in an area with low groundwater recharge rates and groundwater extractions would raise the significance of the impact to moderate to high.

Other impacts were rated to be of either moderate to low significance or of low significance.

All mitigation measures will maintain impacts to acceptable and recoverable levels and no impacts expected to exceed a significance of moderate to low with implementation of proposed mitigation measures.

(ii) Final Site Map

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

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

The majority of the negative implications associated with the Prospecting Application are

related to access and drilling, contamination of surface and groundwater from drilling activities as well as from portable ablution facilities, impacts on wetlands by general prospecting activities and their associated impacts on the surrounding environment.

Positive impact is associated with the brief creation of jobs and is considered of moderate to low significance. This has been assessed in terms of the prospecting operation on its own; however, should this prospecting right be converted into a MR then the social benefits will be of moderate to high significance.

Other positive impacts are associated with rehabilitation once the prospecting activity has been concluded. This is especially true for areas of land that have been degraded due to overgrazing and soil erosion.

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

The objectives of impact mitigation and management are to:

- Primarily pre-empt impacts and prevent the realisation of these impacts – PREVENTION.
- To ensure activities that are expected to impact on the environment are undertaken and controlled in such a way so as to minimise their impacts – MODIFY and/or CONTROL.
- To ensure a system is in place for treating and/or rectifying any significant impacts that will occur due to the proposed activity – REMEDY.
- Implement an adequate monitoring programme to:
    - Ensure that mitigation and management measure are effective.
    - Allow quick detection of potential impacts, which in turn will allow for quick response to issue/impacts.
    - Reduce duration of any potential negative impacts.

Environmental impact management outcomes are:

- Conduct prospecting activities responsibly and ensure operation is compliant with legislative requirements.
- Protect the biophysical environment as far as possible, specifically wetlands and riverine areas and any protected species observed on site.
- To keep, as far as possible, water of differing qualities separates within a prospecting area, so as to minimise contamination of clean run-off and surface water
- Protect the water resources in the area as far as possible.
- Ensure atmospheric pollution is kept to a minimum:
- Ensure adequate rehabilitation to allow continued land use.
- Ensure socially responsible activities.

- Protect historical and cultural sites if they are observed on site.

(m) Aspects for inclusion as conditions of Authorisation.

No activity is to occur within wetlands and their 100m buffer zones or within rivers and their 100m buffer zone / 1:100-year flood line without the necessary authorisation under NEMA and NWA. DWS will need to be consulted and any necessary authorisation will need to be obtained to drill within the 500m NFEPA wetland buffer zones. Protected species must remain *in situ* until the necessary permits are obtained under NEM:BA, NFA, NCNCA and CITES.

Heritage sites and 50m buffer zones will be preserved at all times unless the necessary permits are obtained under SAHRA.

Planning before carrying out prospecting activities in a particular area, and surveying the area before conducting invasive prospecting, is critical to ensure any sensitive areas are preserved and to ensure prospecting proceeds in a manner compliant with national legislation.

Rehabilitation must be applied on an on-going basis and no sites must be left exposed for more time than necessary to obtain the necessary data.

(n) Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

The preliminary positions of the proposed prospecting boreholes have been sited, these may however vary based on the findings of the geotechnical investigations. This is not seen as a major gap as the lack of this knowledge has been worked into the EMP as well as the proposed conditions stipulated above. In general, the approach will be as follows for invasive prospecting:

- As the some of the Land Cover in the Prospecting area is natural the area must be surveyed by a specialist for potential protected species relevant to the region prior to commencing invasive prospecting. Any protected species identified must be avoided or the necessary permits applied for (to destroy / remove / relocate).
- Areas will be visually surveyed for heritage sites prior to commencing with invasive prospecting. These must then be avoided with appropriate buffer zones or the necessary permits applied for.
- Activities must remain outside all wetland areas until authorisation has been obtained under NEMA and NEM: WA.

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

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

Authorisation of the activity should be granted.

The risks of the particular prospecting activity are minimal and can be mitigated by following the EMP, which will reduce impacts significantly to acceptable levels and which should recover.

(ii) Conditions that must be included in the authorisation

No activity is to occur within the NFEPA wetlands and their 100m buffer zones, within rivers and their 100m buffer zone / 1:100-year flood line without the necessary authorisation under NEMA and NWA. DWS will need to be consulted and any necessary authorisation will need to be obtained to drill within the 500m NFEPA wetland buffer zones

Protected species must remain in situ until the necessary permits are obtained under NEM:BA.

No activity is to occur within the Critical Biodiversity Areas and the Ecological Support Areas and their 100m buffer zones.

Heritage sites and 50m buffer zones will be preserved at all times unless the necessary permits are obtained under SAHRA.

Rehabilitation must be applied on an on-going basis and no sites must be left exposed for more time than necessary to obtain the necessary data.

(p) Period for which the Environmental Authorisation is required.

Prospecting activities are likely to require 3 years, including initial data assessment. The EA is requested for a period of 5 years in the event that additional permits or authorisations may be required once invasive prospecting activities commence.

(q) Undertaking

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

Undertaking at the end of the BA and EMP has been fully completed and signed.

(r) Financial Provision

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

The financial provision of R89690.41 has been budgeted for the rehabilitation of the environment after prospecting has taken place and the amount of R16,760,000.00 has been allocated to the prospecting programme over the three-year period.

(i) Explain how the aforesaid amount was derived.

The financial provision required for all the additional environmental management requirements are obtained as follows:

- The budget allocated for prospecting rehabilitation is R89690.41 (See **Table 11)** for calculations).

- Environmental management and monitoring, as per the EMP will be conducted by Thikho Resources where needed, and will form part of their operational running costs.
  - The financial guarantee for rehabilitation costs was calculated using the DMR's rules-based quantum for financial provision and has factored in inflation.
  - The total disturbed area will amount to less than 0.5 Ha and was calculated using the Ariel Extent of activities specified in section g above.

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

Thikho Resources confirms that a financial provision of R89690.41 has been allocated and is available for the rehabilitation of the environment after prospecting has taken place. This will be provided by means of a cash deposit to the DMR.

Table 10 Financial provision for Rehabilitation

No.:	Description:	Unit:	A Quantity	B Master rate	C Multiplication Factor	D Weighing factor 1	E=A*B*C*D Amount (Rands)
			Step 4.5	**Step 4.3**	**Step 4.3**	**Step 4.4**	
3	Temporary Access Roads	m^2	0	R34.05	1	1.1	R0.00
10	General Surface Rehabilitation	ha	0.5	R110 697.13	1	1.1	R60883.41
		Subtotal 1	**Weighing factor 2** (step 4.4) According to Peri-urban			**1.05**	**R63927.59**
		(Sum of total items 3 and 10 multiplied by **weighing factors**)					
1	Preliminary and General	Add 12% of Subtotal 1 if Subtotal 1 is less than R100,000,000.00					R7671.31
2	Contingencies	10% of Subtotal 1					R6392.76
		Subtotal 2					**R77991.66**
		VAT (15%)					R11698.75
		(Subtotal plus VAT)				**GRAND TOTAL**	**R89690.41**

(s) Specific Information required by the competent Authority

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

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

Impact is seen as minimal if EMP is applied to prospecting activities and prospecting sites. Impacts such as veld fires, safety and security of land owners and occupants are envisaged to be minimal. No open fires will be allowed on the prospecting site, no site camps will be established as local people will be used for any manual labour. Skilled personnel from outside Standerton will be housed in town. Traffic control measures will be implemented to minimise any potentials of road accidents. It is not anticipated that the drilling activities will impact on the socio-economic conditions of the landowner / occupier, as the current land use can continue alongside the prospecting.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

No specialist studies were deemed necessary at this phase of the project as the project sensitivity is seen to be Moderate to Low. The management plan has made allowance for mitigation measures to ensure avoidance of these sites should they be encountered, as the prospecting locations will have some degree of flexibility. Where unavoidable, the EMP stipulates that the permits must be obtained under SAHRA.

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

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

Section 24(4)(b)(i) of the Act specifies “investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity.”

This has been addressed in Part A Section 3(f) above. As stipulated, the site is delimited by the prospecting rights area and the extent of the resource. Invasive prospecting area will be delimited by the data from non-invasive techniques. The approach to prospecting is environmentally responsible (by completing non-invasive techniques first) and an industrial norm (drilling is still an acceptable means for resource evaluation as required for the MRA).

PART B
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1 DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME.

(a) Details of the EAP,

This reported was written by Sarah Wanless, Environmental Officer at Sitatunga Resources. The document was then sent to an external, independent EAP for the purposes of review and sign off.

Name: Sarah Wanless

Tel No: 011 783 7996

Fax No: 011 594 9159

E-mail address: sw@sitatunga.com

Summary of Qualifications:

- BA in Geography and Law
- Bachelor of Laws
- BSc Honours in Geography

Summary of Experience:

Sarah has 2 years' experience in Prospecting and drafting BARs and EMP reports. As part of her duties as an environmental officer she is tasked with assessing the social, environmental and heritage components of potential new projects, stakeholder management, GIS mapping and analysis and environmental management reporting for BARs and EMPs.

CVs attached as Appendix 1.

Details of the external EAP (review of the report)

Name: Ruan Mostert

Tel No: 0716913310

E-mail address: ruan@wesst.co.za

Summary of Experience:

Summary of Qualifications

- Masters in Environmental Management
- BSc Honours in Conservation Ecology

Summary of Experience:

Ruan has participated in the completion of variety environmental projects throughout South Africa, including BAR's, EIAs and EMPR's for construction projects, mining houses, industrial developments as well as infrastructure and has more than 11 years' experience as an Environmental Assessment Practitioner. His experience also includes the completion of Section 24G applications, Environmental Management Plans, EMPR's for prospecting and mining right applications, environmental audit reports, acting as an Environmental Control Officer (ECO) compiling monthly environmental compliance audits for construction sites, implementing and maintaining ISO 14 001 Environmental Management Systems and acting as an external ISO 14001 auditor.

CVs attached as ***Appendix 1***.

(b) Description of the Aspects of the Activity

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

A description of the project and associated activities is detailed in Part A: Section 3b-d, and has been further summarised below:

The proposed site is located approximately 14km South East of Ogies, under the Emalahleni Local Municipality, in the Mpumalanga Province. The prospecting area is made up of the remaining extent of Nooitgedacht 37 (as seen in Table 1 below) and the total area that will be affected is approximately 371.337173 Ha

Name:	Nooitgedacht 37 – Remaining Extent
Application area (Ha)	371.33 Ha
Magisterial district:	Emalahleni Local Municipality
Distance and direction from nearest town	~14km South East of Ogies
21-digit Surveyor General Code for each farm portion	T0IS00000000003700000

Thikho Resources wishes to conduct exploration drilling within the proposed prospecting right area (please refer to **Figures** below) for coal and pseudo coal and anthracite. The proposed activities on site will be approached in phases, and will include:

- Non-invasive prospecting, which will consist of:
    - A desktop study and literature review;
    - Obtaining historical borehole data and resource information;
    - Feasibility studies;
    - Geophysical site visit and survey will be conducted by a field geologist

and a geophysics team; and
    - Data will be extracted and plotted into geological maps. Areas for invasive prospecting will be identified for resource determination.

- Invasive prospecting:

Core drilling will then be targeted for areas identified through the non-invasive techniques described above for reserve determination and mine planning. Each borehole will disturb an area of approximately 10m^2; however, the number of boreholes required can only be finalised once the non-invasive prospecting as detailed above is completed; however, preliminary positions have been proposed in **Figure 20 below**:

    - Cores will be sampled and assessed by the on-site geologists and core logs will be maintained.
    - Casing will be removed from the borehole on completion thereof and the borehole sealed in accordance with "Standard Borehole Sealing Procedure" i.e.: each borehole certificated in terms of this procedure.
    - Sealing will include:
        - Removing casing- if casing is to be removed, a specialist borehole contractor will advise on appropriate techniques and associated risks.
        - Backfilling- boreholes should be backfilled with clean uncontaminated material. Backfilled hole should be similar to surrounding strata
        - Seal top of borehole- back filled borehole should be compiled with an impermeable plug to prevent entry of potentially contaminated surface run-off or other liquids.
        - Record details- the depths and position of each layer of backfilling and sealing material.
    - Existing farm roads and tracks will be utilised as far as possible.
    - The proposed timeframe associated with the invasive prospecting is expected to be no more than 3 years.

- Analytical assessment of prospecting data:
    - Data will be assessed in a pre-feasibility study to determine resource estimates to commence with prefeasibility and feasibility assessments for mine planning and Mining Right Application processes.

In terms of NEMA and its EIA Regulations the abovementioned activities trigger Activity 20 of GNR 983 (see **Table 12** below) and is thus subject to a Basic Assessment ("BA") and EMP.

(c) Composite Map

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

Please refer to **Figure** - **Composite Map** below.

Table 11 Listed and Specified Activities

NAME OF ACTIVITY (**E.g. For prospecting** - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc…etc…etc. **E.g. for mining, -** excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
Access routes	Farm roads will be used as far as possible. No additional roads will be constructed.		
Drilling	10m^2 per borehole. It is anticipated that 20 boreholes will be drilled.	X	GNR 983 Activity 20
Casing of boreholes	10m^2 per borehole. It is anticipated that 20 boreholes will be drilled.		
Ablution facility (portable toilets)	Portable toilets will be used		
Temporary core/equipment store and site office; comprising of shade and seating for meals may be established. Staff will be accommodated in town.	0.05 Ha		
Hydrocarbon Storage	Less than 80m^2		
Rehabilitation of boreholes	See above		

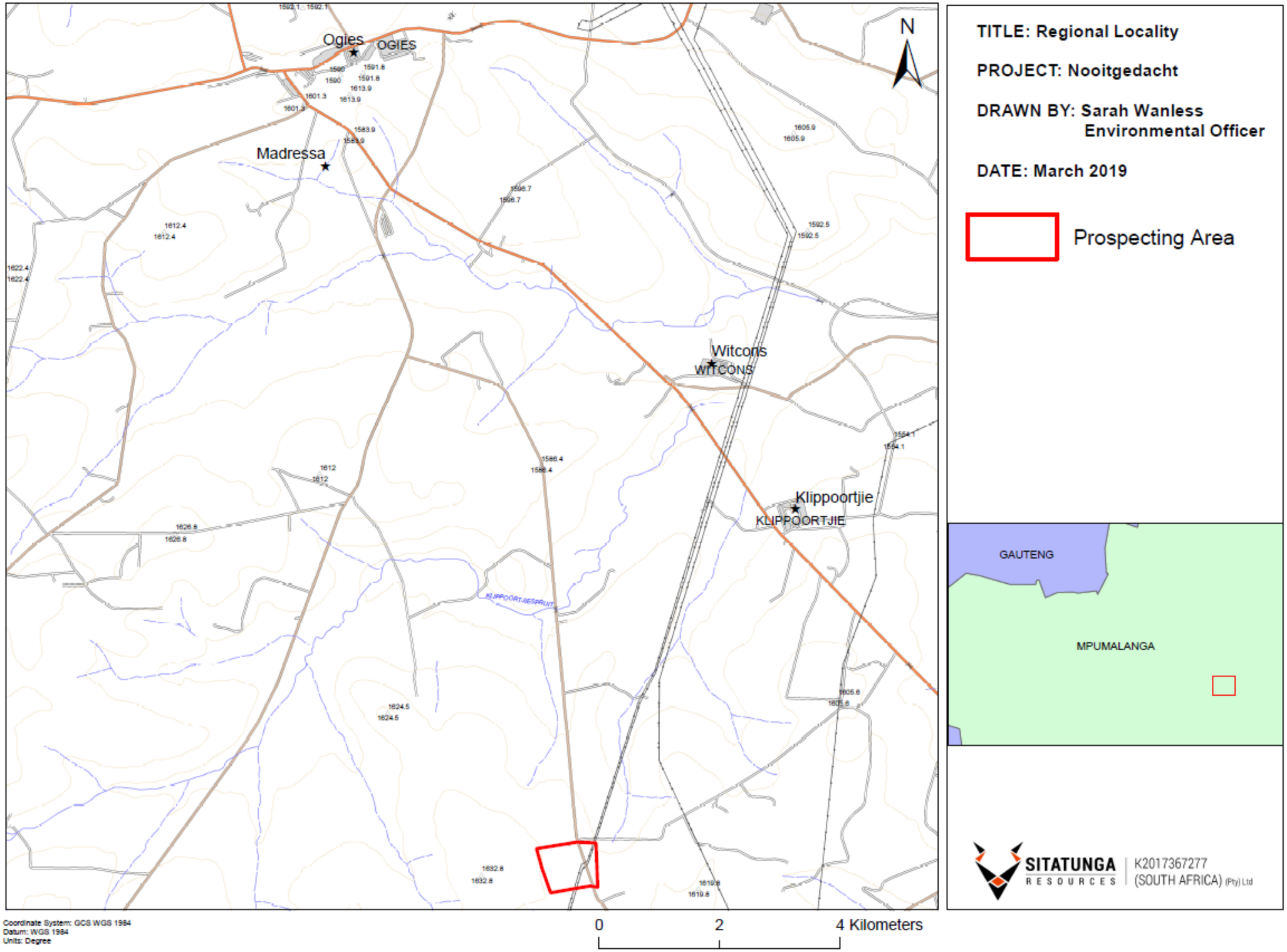


Figure 14 Site Locality

Figure 15 Site Plan

(d) Description of Impact management objectives including management statements

The objectives of impact mitigation and management are to:

- Primarily pre-empt impacts and prevent the realisation of these impacts - PREVENTION.
    - Plan prospecting routes and sites to prevent impact to wetlands and rivers and the appropriate buffer zones, or obtain relevant authorisation / licence under NEMA / NWA.
    - Survey proposed routes and prospecting sites to prevent impact to heritage sites that may be discovered whilst prospecting on site, or obtain relevant permit under SAHRA.
    - Survey proposed routes and prospecting sites to prevent impact to protected species that may occur in prospecting areas, or obtain relevant permit under NEM:BA.
- To ensure activities that are expected to impact on the environment are undertaken and controlled in such a way so as to minimise their impacts – MODIFY and/or CONTROL.
    - Reduce risk of contamination to the environment from vehicles, machinery, drill rigs and equipment (emissions, hydrocarbon spills, and excessive noise) by ensuring regular maintenance and keeping drip pans available at all times.
    - Collect all litter, sort and store according to the appropriate waste stream and dispose of at a licensed facility.
    - Inspect and maintain portable toilets to reduce risk of contamination through sewage spills.
    - To keep, as far as possible, water of differing qualities separate within a prospecting area, so as to minimise contamination of clean run-off and surface water
    - Spray route and areas of activity with water when dry to reduce fugitive dust emissions.
    - Regularly communicate prospecting intentions to local land owners / users.
    - Keep vehicles and machinery free from plant matter to reduce risk of introduction and spread of alien and invasive species.
    - Establish and enforce speed limits on all roads.
- To ensure a system is in place for treating and/or rectifying any significant impacts that will occur due to the proposed activity – REMEDY.
    - Keep hydrocarbon spill kits on site at all times to clear any spills that occur.
    - Implement the inspection and monitoring plan stipulated in the EMP

and take the necessary action for any issues observed on site.

- Implement an adequate monitoring programme to:
    - Ensure that mitigation and management measure are effective.
    - Allow quick detection of potential impacts, which in turn will allow for quick response to issue/impacts.
    - Reduce duration of any potential negative impacts.

(i) Determination of closure objectives.

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

Closure objectives must be met with regards to:

Topography

- To ensure that the final elevation of drilled areas is free draining.

Soil and Land Capability

- To ensure that top soil (with vegetation clods where applicable) is replaced to the surface of rehabilitated areas to restore vegetation growth and reduce risk of erosion.

Surface Water

- To ensure no sedimentation or contamination of the surrounding surface water systems.

Ground Water

- To ensure no contamination of the local ground water systems.

Flora and Fauna

- To ensure that alien invasive establishment and spread on areas disturbed by prospecting is prevented and controlled.
- To preserve protected species in situ as far as possible.

Wetlands

- To prevent disturbance to wetlands and maintain current wetland status and maintain ecological corridors associated with rivers and wetlands.

(ii) Volumes and rate of water use required for the operation.

No processing water requirements. Water will be brought onto site for potable use; this is estimated at 5 litres per person/day. Groundwater will be used in conjunction with the water brought onto site for any drilling requirements.

(iii) Has a water use licence has been applied for?

No application for water use has been made to date. It is assumed that any water use will fall under a general authorisation.

(iv) Impacts to be mitigated in their respective phase

ACTIVITY Whether listed or not listed.	PHASE In which impact is anticipated	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Access routes	Operation, construction Decommissioning	Farm roads will be used as far as possible. No additional roads will be constructed.	REMEDY THROUGH: Ripping compacted soils. Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Remaining in designated roads / routes / activity areas. Survey any off road routes to prevent damage to red data plants and heritage sites. Maintaining all vehicles, equipment, machinery and equipment and discontinuing use of faulty equipment. Equipping vehicles on site with drip trays to place under leaky equipment. Dust alleviation by spraying and limiting speeds on dirt roads Noise control measures on noisy equipment. Regular communication with nearby I&APs. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so.	CARA, NEMA and MPRDA regulations regarding soil amelioration. General duty of care in terms of NEMA NWA will be complied with to ensure that the quantity, quality and reliability of water required to maintain the ecological function on which human depends is maintained.	1. Once-off sign-off of route plans or amendments to these plans before any activities take place for the duration of prospecting operations. 2. Once off inspection of routes and prospecting sites after activity in the area has ceased.
Drilling	Operation, Decommissioning, Closure	$10m^2$ per borehole. 20 Boreholes have been provisionally sited	REMEDY THROUGH: Ripping compacted soils. Clearing any spills. Lining sumps with the appropriate lining system. Using biodegradable fluids/polymers. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Planning drill sites properly to avoid sensitive features. Remaining in designated roads / routes / prospecting areas. Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubricant. Placing drip trays under leaky equipment. Dust alleviation by spraying and limiting speeds on dirt roads. Noise control measures on noisy equipment. Responsible water use. Regular communication with nearby I&APs. Contracting necessary specialists as needed. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so. Should any graves/ruins be found during prospecting a buffer will be established and maintained around these areas.	NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation. SAHRA will be complied with regarding permits for destruction and relocation or management of heritage sites; and applicable buffers. NWA will be complied with to ensure that the quantity, quality and reliability of water required to maintain the ecological function on which human depends is maintained.	1. Once-off sign-off of route plans or amendments to these plans before any activities take place for the duration of prospecting operations. 2. Once off inspection of rehabilitated areas.
Casing of boreholes	Operation, Decommissioning, Closure	$10m^2$ per borehole.20 boreholes have been provisionally sited	REMEDY THROUGH: Rehabilitating and repairing any damage. Inspection and immediate action.	NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation requirements.	1. Once-off inspection of drilled boreholes after substantial rainfall

Ablution facility (portable toilets)	Operation	Portable toilets will be used	REMEDY THROUGH: Inspection and repair / replacement of damaged toilets. CONTROL THROUGH: Contracting necessary reputable contractor to manage portable toilets. Proper housekeeping and hygienic practices. Inspection and immediate action.	General duty of care in terms of NEMA & NWA.	1. Weekly inspections of portable toilet facilities for the duration of prospecting activities.
Temporary core/equipment store and site office; comprising of shade and seating for meals may be established. Staff will be accommodated in town.	Operation	0.05 Ha	REMEDY THROUGH: Ripping up of compacted soils Inspect and clear all litter and waste. Removal of alien and invasive species that may establish around prospecting sites. Relocating protected species for which permits are obtained rather than destroying species. Reporting any non-compliant incidences to the relevant authorities and following their requirements. Inspection and immediate action. CONTROL THROUGH: Providing bins on site. Contracting necessary reputable contractors for the removal and disposal of general waste at a licensed facility. Clear all vehicles coming to site of any vegetative material. Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm or trap animals. Noise control measures. Visually surveying prospecting sites for any protected species or heritage sites. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so.	General duty of care in terms of NEMA, NWA, NFA and NCNCA and must be applied when necessary.	1. Weekly inspections of the site camp and surrounding area for the duration of prospecting activities.
Hydrocarbon Storage	Operation	80m^2	REMEDY THROUGH: Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubricant Placing drip trays under leaky equipment. The area is less than 80m^2 Plastic lining will be used Spill kits will be on hand in the event of a spillage Safe work procedure will be adhered to when refuelling vehicles and machinery Storing hydrocarbons within portable bund tanks. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings.	General duty of care in terms of NEMA & NWA.	1. Weekly inspections of the vehicles and storage area for the duration of prospecting activities.

Rehabilitation of boreholes	Operation, Decommissioning, Closure	10m^2 per borehole.20 boreholes have been provisionally sited.	REMEDY THROUGH Rehabilitation must be on-going as soon as drilling results are completed.	General duty of care in terms of NEMA. MPRDA rehabilitation standards.	1. Monthly once invasive prospecting commences for the duration of prospecting. 2. Once-off inspection of rehabilitated sites after substantial rainfall.
General overall prospecting activities	Operation, Decommissioning, Closure	The general prospecting activities will be 620m^2 (the combined total of all the aforementioned activities	REMEDY THROUGH: Inspect and clear all litter and waste. Removal of alien and invasive species that may establish around prospecting sites. Relocating protected species for which permits are obtained rather than destroying species. Reporting any non-compliant incidences to the relevant authorities and following their requirements. Inspection and immediate action. CONTROL THROUGH: Providing bins on site. Contracting necessary reputable contractors for the removal and disposal of general waste at a licensed facility. . Clear all vehicles coming to site of any vegetative material. Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm or trap animals. Noise control measures. Visually surveying prospecting sites and proposed routes for any protected species or heritage sites before bringing drill rigs to drilling sites. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so.	MPRDA requirement and standards regarding prospecting and rehabilitation of prospecting areas.	1. Monthly visual inspection of the active prospecting areas.2. Once-off inspection of rehabilitated sites after substantial rainfall.

(e) Impact Management Outcomes

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

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Access routes	Potential for compaction of soils. Potential hydrocarbon contamination of soil. Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately. Potential hydrocarbon contamination through contaminated runoff. Potential hydrocarbon contamination seeping to the groundwater environment. Generation of dust on gravel roads. Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles. Increased noise levels. Increased potential for road incidences. Road degradation.	Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems Groundwater Air Quality Noise Traffic & Safety	Operation, Decommissioning	REMEDY THROUGH: Ripping compacted soils. Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Remaining in designated roads / routes / activity areas. Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Equipping vehicles on site with drip trays to place under leaky equipment. Dust alleviation by spraying and limiting speeds on dirt roads Noise control measures on noisy equipment. Regular communication with nearby I&APs. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so.	Reduce compaction of soil and maintain existing land capability. Vehicles, machinery and equipment maintained within operational specification and legislative requirements. Prevent disturbance to surface water features. Dust fallout will be managed to not exceed 600mg/m^2/day. Keep equipment, machinery and vehicles operating within their manufacturing specifications. Prevent nuisance noise to nearby land owners / users. High safety standards on site with reduced safety risks. To keep, as far as possible, water of differing qualities separate within a prospecting area, so as to minimise contamination of clean run-off and surface water
Drilling	Localised dips in topography if boreholes collapse after material is replaced. Cracks and disruption to geological layers. Potential for compaction of soils. Potential hydrocarbon contamination of soils. Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately. Potential hydrocarbon contamination of surface water through contaminated runoff. Irresponsible use of water and water wastage. Cracks and disruption to aquifers. Potential hydrocarbon contamination seeping to the groundwater environment. Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles. Increased noise levels. Loss of and disturbance to archaeological / heritage / grave sites that may be encountered.	Topography Geology Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems Groundwater Air Quality Noise Archaeological/Cultural Sites	Operation, Decommissioning, Closure	REMEDY THROUGH: Ripping compacted soils. Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Planning invasive prospecting sites properly to avoid sensitive features. Remaining in designated roads / routes / prospecting areas. Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Equipping vehicles on site with drip trays to place under leaky equipment. Dust alleviation by spraying and limiting speeds on dirt roads Noise control measures on noisy equipment. Responsible water use. Regular communication with nearby I&APs. Contracting necessary specialists as needed. Maintaining a buffer around the ruins/graves at all times during Prospecting Activities Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so.	Restore natural catchment drainage patterns as far as possible. Reduce compaction of soil and maintain existing arable land capability. Vehicles, machinery and equipment maintained within operational specification and legislative requirements. Prevent disturbance to surface water features. Utilise water responsibly. Keep equipment, machinery and vehicles operating within their manufacturing specifications. Prevent nuisance noise to nearby land owners / users Preservation of heritage sites. To keep, as far as possible, water of differing qualities separate within a prospecting area, so as to minimise the contamination of clean run-off and surface water
Casing of boreholes	Localised dips in topography if boreholes collapse after material is replaced.	Topography	Operation, Decommissioning,	REMEDY THROUGH: Rehabilitating and repairing any damage.	Restore natural catchment drainage patterns as far as possible.

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
			Closure	Inspection and immediate action.	
Ablution facility (portable toilets)	Potential contamination of soil with sewage. Potential contamination of surface water bodies with sewage.	Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems	Operation	REMEDY THROUGH: Inspection and repair / replacement of damaged toilets. CONTROL THROUGH: Contracting necessary reputable contractor to manage portable toilets. Proper housekeeping and hygienic practices. Inspection and immediate action.	Reduced bacterial contamination and associated health effects on neighbouring areas.
Temporary camp/equipment store and site office; comprising of shade and seating for meals may be established. Staff will be accommodated in town.	Potential of compaction of soils Potential hydrocarbon contamination of soil. Potential hydrocarbon contamination through contaminated runoff. Potential hydrocarbon contamination seeping to the groundwater environment Alienation of, and disturbance to, animals. Potential contamination of soil with indiscriminately dumped waste or littering. Potential contamination of surface water features with indiscriminately dumped waste or littering. Disturbance/damage to vegetation	Soil & Land Capability Surface Water & Associated Wetlands and Aquatic Ecosystems Groundwater Fauna Flora	Operation, Decommissioning, Closure	REMEDY THROUGH: Ripping up of compacted soils Clearing all litter and waste. Removal of alien and invasive species that may establish around prospecting sites. Relocating protected species for which permits are obtained rather than destroying species. Reporting any non-compliant incidences to the relevant authorities and following their requirements. Inspection and immediate action. CONTROL THROUGH: Collecting waste for disposal at a licensed facility. Clear all vehicles coming to site of any vegetative material. Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm or trap animals. Noise control measures. Visually surveying prospecting sites for any protected species or heritage sites. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so.	Maintain existing land capability. Reduce impact to neighbouring areas and surface water features, which will provide refuge for animals and provide ecological corridors. Preservation of protected species. Attain "cradle to grave" management of waste on site. To keep, as far as possible, water of differing qualities separate within a prospecting area, so as to minimise the contamination of clean run-off and surface water
Hydrocarbon Storage	Potential hydrocarbon contamination of soil. Potential hydrocarbon contamination through contaminated runoff. Potential hydrocarbon contamination seeping to the groundwater environment Potential Fire outbreaks	Soil & Land Capability Surface Water & Associated Wetlands and Aquatic Ecosystems Groundwater	Operation, Decommissioning, Closure	REMEDY THROUGH: Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubricant Placing drip trays under leaky equipment. Storing all hydrocarbons within portable bunding. Spill kits will be on hand in the event of a spillage Safe work procedure will be adhered to when refuelling vehicles and machinery Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings.	SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. To keep, as far as possible, water of differing qualities separate within a prospecting area, so as to minimise the contamination of clean run-off and surface water

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Rehabilitation of boreholes	Topographical nature of the area will be restored through rehabilitation. Soil replacement and revegetation through rehabilitation of drill sites.	Topography Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems	Operation, Decommissioning, Closure	No mitigation necessary. Impact is positive	Restore natural catchment drainage patterns as far as possible. Restore land to arable land use.
General overall prospecting activities	Potential contamination of soil with indiscriminately dumped waste or littering. Potential contamination of surface water features with indiscriminately dumped waste or littering. Potential contamination of groundwater through seepage from indiscriminately dumped waste or litter. Alien invasive encroachment. Alienation of, and disturbance to, animals. Destruction of natural vegetation and protected species.	Soil & Land Capability Surface Water & Associated Wetlands & Aquatic Ecosystems Groundwater Flora & Fauna	Operation, Decommissioning, Closure	REMEDY THROUGH: Clearing all litter and waste. Removal of alien and invasive species that may establish around prospecting sites. Relocating protected species for which permits are obtained rather than destroying species. Reporting any non-compliant incidences to the relevant authorities and following their requirements. Inspection and immediate action. CONTROL THROUGH: Collecting waste for disposal at a licensed facility. Clear all vehicles coming to site of any vegetative material. Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm and trap animals. Noise control measures. Visually surveying prospecting sites and proposed routes for any protected species or heritage sites before bringing drill rigs to drilling sites. Every person in control of prospecting activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into prospecting workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so.	Attain "cradle to grave" management of waste on site. Alien and invasive species managed with the view to eradicate species in disturbed areas. Reduce impact to neighbouring areas and surface water features, which will provide refuge for animals and provide ecological corridors. Preservation of protected species. To keep, as far as possible, water of differing qualities separate within a prospecting area, so as to minimise the contamination of clean run-off and surface water
General overall prospecting activities	Theft and safety risks to surrounding landowners	Socio-economic and Health & Safety	Operation	CONTROL THROUGH: Ensuring farm gates are closed at all times. STOP: No employees will be allowed to stay over on site after working hours. No employee will be allowed to loiter around farms	To leave site without any incidents safety risks and theft to surrounding farmers.

(f) Impact Management Actions

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

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Access routes	Potential for compaction of soils. Potential hydrocarbon contamination of soil. Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately. Potential hydrocarbon contamination through contaminated runoff. Potential hydrocarbon contamination seeping to the groundwater environment. Generation of dust on gravel roads. Emissions into the atmosphere through use of diesel-powered equipment, machinery and vehicles. Increased noise levels. Increased potential for road incidences. Road degradation.	REMEDY THROUGH: Ripping compacted soils. Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Remaining in designated roads / routes / activity areas. Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Equipping vehicles on site with drip trays to place under leaky equipment. Dust alleviation by spraying and limiting speeds on dirt roads Noise control measures on noisy equipment. Regular communication with nearby I&APs. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so.	Operation, Decommissioning	CARA, NEMA and MPRDA regulations regarding soil amelioration. General duty of care in terms of NEMA. SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA. NWA will be complied with to ensure that the quantity, quality and reliability of water required to maintain the ecological function on which human depends is maintained.
Drilling	Localised dips in topography if boreholes collapse after material is replaced. Cracks and disruption to geological layers. Potential for compaction of soils. Potential hydrocarbon contamination of soils. Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately. Potential hydrocarbon contamination through contaminated runoff. Irresponsible use of water and water wastage. Cracks and disruption to aquifers. Potential hydrocarbon contamination seeping to the groundwater environment. Emissions into the atmosphere through use of diesel-powered equipment, machinery and vehicles. Increased noise levels. Loss of and disturbance to archaeological / heritage / grave sites that may be encountered.	REMEDY THROUGH: Ripping compacted soils. Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. Isolate porous or highly transmissive groundwater zones through capping or grouting to prevent clean groundwater ingress or recharge of contaminated water. CONTROL THROUGH: Planning invasive prospecting sites properly to avoid sensitive features. Remaining in designated roads / routes / prospecting areas. Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Equipping vehicles on site with drip trays to place under leaky equipment. Dust alleviation by spraying and limiting speeds on dirt roads	Operation, Decommissioning, Closure	NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation requirements. NWA will be complied with to ensure that the quantity, quality and reliability of water required to maintain the ecological function on which human depends is maintained.

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		Noise control measures on noisy equipment. Responsible water use. Regular communication with nearby I&APs. Contracting necessary specialists as needed. Maintaining a buffer around the ruins/graves at all times during Prospecting Activities Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. Limit development to target rocks and reduce exposure of aquifer rocks. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so.		
Casing of boreholes	Localised dips in topography if boreholes collapse after material is replaced.	REMEDY THROUGH: Rehabilitating and repairing any damage. Inspection and immediate action	Operation, Decommissioning and Closure	NEMA & MPRDA principals and regulations regarding environmental protection and rehabilitation requirements. .
Ablution facility (portable toilets)	Potential contamination of soil with sewage. Potential contamination of surface water bodies with sewage.	REMEDY THROUGH: Inspection and repair / replacement of damaged toilets. CONTROL THROUGH: Contracting necessary reputable contractor to manage portable toilets. Proper housekeeping and hygienic practices. Inspection and immediate action.	Operation	General duty of care in terms of NEMA & NWA.
Temporary core/equipment store and site office; comprising of shade and seating for meals may be established. Staff will be accommodated in town.	Potential of compaction of soils Potential hydrocarbon contamination of soil. Potential hydrocarbon contamination through contaminated runoff. Potential hydrocarbon contamination seeping to the groundwater environment Alienation of, and disturbance to, animals. Potential contamination of soil with indiscriminately dumped waste or littering. Potential contamination of surface water features with indiscriminately dumped waste or littering. Disturbance/damage to vegetation	REMEDY THROUGH: Ripping up of compacted soils Clearing all litter and waste Soil & Removal of alien and invasive species that may establish Land Capability around prospecting sites. Relocating protected species for which permits are obtained rather than destroying species. Reporting any non-compliant incidences to the relevant authorities and following their requirements. Inspection and immediate action. CONTROL THROUGH: Collecting waste in bins for disposal at a licensed facility. Clear all vehicles coming to site of any vegetative material. Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm or trap animals.	Operation, Decommissioning,	General duty of care in terms of NEMA & NWA.

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		Noise control measures. Visually surveying prospecting sites for any protected species or heritage sites. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. STOP THROUGH: Preventing activities within 100m of streams and wetlands obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so.		
Hydrocarbon Storage	Potential hydrocarbon contamination of soil. Potential hydrocarbon contamination through contaminated runoff. Potential hydrocarbon contamination seeping to the groundwater environment	REMEDY THROUGH: Clearing any spills. Ceasing and rehabilitating any illegal activity. Rehabilitating and repairing any damage. Inspection and immediate action. CONTROL THROUGH: Maintaining all vehicles, machinery and equipment and discontinuing use of faulty equipment. Using biodegradable lubricant Placing drip trays under leaky equipment. The area is less than $80m^2$ Storing all hydrocarbons within portable bunding. Spill kits will be on hand in the event of a spillage Safe work procedure will be adhered to when refuelling vehicles and machinery Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings.	Operation	General duty of care in terms of NEMA & NWA. SANS / SABS / SA legislative requirements regarding vehicle and equipment maintenance and operating requirements. General duty of care in terms of NEMA.
Rehabilitation of boreholes	Topographical nature of the area will be restored through rehabilitation. Soil replacement and revegetation through rehabilitation of drill sites.	No mitigation necessary. Impact is positive	Operation, Decommissioning, Closure	Best Practice Guidelines Restore natural catchment drainage patterns as far as possible. Restore land to arable land use.
General overall prospecting activities	Potential contamination of soil with indiscriminately dumped waste or littering. Potential contamination of surface water features with indiscriminately dumped waste or littering. Potential contamination of groundwater through seepage from indiscriminately dumped waste or litter. Alien invasive encroachment.	REMEDY THROUGH: Clearing all litter and waste. Removal of alien and invasive species that may establish around prospecting sites. Relocating protected species for which permits are obtained rather than destroying species. Reporting any non-compliant incidences to	Operation, Decommissioning, Closure	General Practice Guidelines Attain "cradle to grave" management of waste on site. Alien and invasive species managed with the view to eradicate species. Reduce impact to neighbouring areas and surface water features, which will provide refuge for animals and provide ecological corridors. Preservation of protected species.

ACTIVITY Whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	Alienation of, and disturbance to, animals. Destruction of natural vegetation and protected species.	the relevant authorities and following their requirements. Inspection and immediate action. CONTROL THROUGH: Clear all vehicles coming to site of any vegetative material. Maintaining wetlands and buffer zones as ecological corridors and refuges. Do not hinder, harm and trap animals. Noise control measures. Visually surveying prospecting sites and proposed routes for any protected species or heritage sites before bringing drill rigs to drilling sites. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. STOP THROUGH: Preventing activities within 100m of streams and wetlands unless authorisation is obtained to do so. Preventing activities near potential heritage sites unless necessary permits are obtained to do so.		

(i) Financial Provision

(1) Determination of the amount of Financial Provision.

a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

Closure objectives identified include:

Topography

- To ensure that the final elevation of rehabilitated areas is free draining.
  - The localised nature of the prospecting activities means that attaining objective will result in restoration of baseline conditions.

Soil and Land Capability

- To ensure that top soil (with vegetation clods where applicable) are replaced to the surface of rehabilitated drilled sites to maintain arable land capability and reduce risk of erosion.
  - By removing soil clods with vegetation, the baseline conditions will be minimally altered and will recover fully to baseline condition over a short to medium term duration.

Surface Water

- To ensure no sedimentation of the surrounding surface water systems.
- To ensure no chemical contamination of any present surrounding surface water systems

Ground Water

- To ensure no contamination of ground water or disturbance to ground water aquifers.

Flora and Fauna

- To ensure that alien invasive establishment and spread in all disturbed areas is prevented and controlled.
  - The aim is to reduce introduction of new species or spread of existing species. The baseline conditions are not expected to vary greatly but EMP measures, inspection and action must be implemented.
- To preserve protected species in situ as far as possible.
  - Baseline conditions are not expected to change as prospecting locations will allow for some flexibility to avoid such species. Where unavoidable, EMP measures, inspection and action must be implemented.

Wetlands

- To prevent disturbance to wetlands and maintain current wetland status and maintain ecological corridors associated with rivers and wetlands.

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

To be completed.

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

This application is for a prospecting application. Please refer to **Figure 19** for the preliminary position of the prospecting boreholes (please note that these are subject to change following the outcome of the Geophysics survey). Each individual drill site will impact a maximum footprint of 10m^2, which will be rehabilitated as soon as the necessary data is obtained.

The rehabilitation plan is as follows:

Drilling: Cores will be removed, logged and where necessary samples taken for laboratory analysis.

- On rehabilitation, cores will be replaced into boreholes, casings removed and area levelled.
- Area will be inspected and graded if dips in topography are noted from collapsed boreholes.

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

Rehabilitation plan has aimed to:

- Restore topography and drainage and prevent topographical dips and pooling of water.
- Retain topsoil and associated vegetative component to maintain the current land use.
- Prevent risk of sedimentation of downstream water bodies.
- Prevent contamination of ground water resources.
- Preserve local flora as vegetation with topsoil clods and reduce risk of alien infestation on disturbed areas.

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

The financial provision was calculated using the DMR's rule-based assessment (**Table 13)** and is estimated to be R85 375.86. Currently it is expected that the disturbed area will be

limited to a maximum of 0.5ha. A site camp will be established on site; and existing farm roads and tracks will be utilised as far as possible. Environmental management and monitoring, as per the EMP will be conducted where needed by in-house Environmental Managers.

Table 12 Financial Provision for Rehabilitation

No.:	Description:	Unit:	A Quantity	B Master rate	C Multiplication Factor	D Weighing factor 1	E=A*B*C*D Amount (Rands)
			Step 4.5	**Step 4.3**	**Step 4.3**	**Step 4.4**	
3	Temporary Access Roads	m^2	0	R34.05	1	1.1	R0.00
10	General Surface Rehabilitation	ha	0.5	R110 697.13	1	1.1	R60883.41
		Subtotal 1	**Weighing factor 2** (step 4.4) According to Peri-urban			**1.05**	**R63927.59**
		(Sum of total items 3 and 10 multiplied by **weighing factors**)					
1	Preliminary and General	Add 12% of Subtotal 1 if Subtotal 1 is less than R100,000,000.00					R7671.31
2	Contingencies	10% of Subtotal 1					R6392.76
		Subtotal 2					**R77991.66**
		VAT (15%)					R11698.75
		(Subtotal plus VAT)				**GRAND TOTAL**	**R89690.41**

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

Thikho Resources confirms that a financial provision of R89690.41 has been allocated and is available for the rehabilitation of the environment after prospecting has taken place. This will be provided by means of a cash deposit to DMR.

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

(g) Monitoring of Impact Management Actions

(h) Monitoring and reporting frequency

(i) Responsible persons

(j) Time period for implementing impact management actions

(k) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Access routes	Increased potential for road incidences. Road degradation.	1. Maintain roads and intersections with public roads to reduce road incidences. 2. Ensure that on-site speed limits are enforced to reduce dust generation and road incidences.	1. Site manager 2. Site manager	1. Monthly inspections of all farm roads and intersections from the onset of operations for the duration of prospecting operations. 2. Sporadic speed inspections for the duration of prospecting operations.
Access routes, Drilling	Cracks and disruption to geological layers. Potential for disturbance to wetlands and buffer zones if activity proceeds indiscriminately.	1. Ensure sensitive sites are avoided or that necessary authorisations / permits are obtained where these cannot be avoided through sign-off of all onsite activity plans.	1. Environmental manager and site manager	1. Once-off sign-off of drilling plans or amendments to these plans before any activities take place for the duration of prospecting operations.
Access routes, Drilling	Potential for compaction of soils, alteration to soil characteristics and potential loss of soil. Potential silt loading of surface water features.	1. Ensure sensitive sites are avoided or that necessary authorisations / permits are obtained where these cannot be avoided through sign-off of all onsite activity plans. 2. Inspect all routes and prospecting sites for compacted soils. 3. Ensure responsible material and soil handling and replacement. 4. Inspect all routes and prospecting sites for soil erosion or degradation.	1. Environmental manager and site manager 2. Environmental manager 3. Environmental manager with the contracting prospecting manager 4. Environmental manager	1. Once-off sign-off of route plans or amendments to these plans before any activities take place for the duration of prospecting operations. 2. Once off inspection of rehabilitated areas after substantial rainfall. 3. Monthly inspection once invasive prospecting commences for the duration of prospecting. 4. Monthly inspection once invasive prospecting commences for the duration of prospecting.
Access routes, Drilling	Potential hydrocarbon contamination to soil, surface water and associated wetlands, to groundwater.	1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks. 2. Ensure area is clear of hydrocarbon spills. 3. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. 4. Lining sumps with the appropriate lining system. 5. Using biodegradable fluids/polymers.	1. Site manager in conjunction with prospecting manager 2. Site manager	1. Weekly inspection of all vehicle and equipment service and maintenance log books for the duration of prospecting operations. 2. Daily inspection of active routes and drilling areas.
Access routes, Drilling	Generation of dust on gravel roads.	1. Visual inspection for billowing dust clouds.	1. Environmental manager	1. Sporadic visual inspection of billowing dust clouds from prospecting areas throughout prospecting operations.
Access routes, Drilling	Emissions into the atmosphere through use of diesel powered equipment, machinery and vehicles.	1. Ensure vehicles are within operation specifications to prevent excessive noise, emission and reduce risks of leaks.	1. Site manager in conjunction with prospecting manager	1. Weekly inspection of all vehicle and equipment service and maintenance log books for the duration of prospecting operations.
Drilling & borehole casings.	Dips in topography at prospecting sites and associated potential for pooling of water. Potential contamination of ground water resources.	1. Inspect drilled sites for localised dipping in topography or pooling of water prevent any oil spills or leaks into borehole.	1. Environmental manager	1. Once-off inspection of drilled boreholes after substantial rainfall. 2. Daily check of oil leaks
Drilling	Irresponsible use of water and water wastage.	1. Reduce water wastage.	1. Environmental manager	1. Include water conservation in the environmental awareness / induction training.
Access routes, Drilling	Loss of and disturbance to archaeological / heritage / grave	1. Preserve any heritage and cultural sites encountered.	1. Social manager	1. Once-off survey for heritage sites on areas targeted for travel and / or drilling prior to activity in the area.

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
	sites that may be encountered			
Ablution facility (portable toilets)	Potential contamination of soil, surface water and associated wetlands, and groundwater with sewage	1. Ensure portable toilet facilities are in proper working condition, not overflowing or leaking and hygienic. 2. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings.	1. Prospecting manager	1. Weekly inspections of portable toilet facilities for the duration of prospecting activities.
Temporary core/equipment store and site office; comprising of shade and seating for meals may be established. Staff will be accommodated in town.	Potential of compaction of soils Potential hydrocarbon contamination of soil. Potential hydrocarbon contamination through contaminated runoff. Potential hydrocarbon contamination seeping to the groundwater environment Alienation of, and disturbance to, animals. Potential contamination of soil with indiscriminately dumped waste or littering. Potential contamination of surface water features with indiscriminately dumped waste or littering. Disturbance/damage to vegetation Potential theft of equipment	1. Reduce overall impacts associated with the activities carried out at the temporary store / office site 2. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. 3. Security measures should be put in place to safe guard equipment on site.	Site Manager in conjunction with Environmental Manager	1. Weekly inspections of the store / office site and surrounding areas for the duration of the prospecting activities
Hydrocarbon Storage	Potential hydrocarbon contamination of soil. Potential hydrocarbon contamination through contaminated runoff. Potential hydrocarbon contamination seeping to the groundwater environment Potential of fire outbreaks, should hydrocarbons be exposed to open fires.	1. Ensure that all machinery and vehicles are in proper working condition with no leaking and are fully equipped with portable bunding and drip trays with a spill kits on site. 2. Every person in control of a mine or activity must take reasonable measures to take effective measures to minimise the flow of any surface water or floodwater into mine workings, opencast workings, other workings or subterranean caverns, through cracked or fissured formations, subsided ground, sinkholes, outcrop excavations, adits, entrances or any other openings. 3. No open fires should be allowed on site and serviced fire extinguishers should be provided on site.	1. Prospecting Manager in conjunction with Environmental Manager	1. Weekly inspections will be conducted during the duration of the prospecting activities

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

An annual performance assessment (or at a frequency stipulated in the EA) will be conducted by an external consultant throughout the life of prospecting as required under NEMA. This is conducted to assess the adequacy and compliance to the EMP, EA and the relevant legislation.

(i) Environmental Awareness Plan

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

The Environmental Manager, Site Manager and Prospecting Manager must be conversant in environmental legislation, with special reference to the MPRDA, NEMA, NFA, NCNCA and the NWA.

The contractor / driller will be responsible for training its staff in terms of general environmental awareness. This will include basic training on the contents of this EMP; and will be conducted prior to commencement of prospecting activities. The aim of the environmental awareness training will be to highlight the potential impacts of the prospecting activities, and to highlight no-go areas.

The contractor / driller will ensure that records are kept of all training sessions / inductions. The Environmental Manager will monitor these records and undertake regular follow ups.

Appendix 5 includes a hand-out to be made available to all personnel / labourers on site.

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

Training, as detailed above, will address the specific measures and actions as listed in the EMP and also conditions of the EA. In this way, the prospecting team will be provided the knowledge required to conduct the prospecting activities without resulting in environmental non-compliance, the liability of which would lie with Thikho Resources. Secondly, informing the prospecting team of the EMP will also assist the team in identifying if an impact is likely to occur / has occurred and communicate this appropriately to the Environmental Manager.

In order for appropriate action to be taken, proper communications network and reporting protocol must be established, with the prospecting team and the site manager reporting all environmental and social issues to the Environmental.

(m) Specific information required by the Competent Authority

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

Any requirements made by the authority or under the conditions of the EA will be attended to.

The financial provision will be reviewed annually.

2) UNDERTAKING

The EAP herewith confirms

a) The correctness of the information provided in the reports ☐
b) The inclusion of comments and inputs from stakeholders and I&APs;☐
c) The inclusion of inputs and recommendations from the specialists reports where relevant;☐ and
d) That the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein. ☐

Signature of the environmental assessment practitioner.

Name of company

Date

- END -