BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

Prospecting Right Application on portion of portion 1 of the farm Simdlangentsha No. 16956 HU

and the whole extent of the farm Bongaspoort 16930 HU

DMRE Reference Number: KZN 30/5/1/1/2/11230 PR

PREPARED FOR:

ULIBO RESOURCES (Pty) Ltd
Reg Nr: 2013/099506/07

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mineral resources & energy
Department:
Mineral Resources and Energy
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: Ulibo Resources (Pty) Ltd

ULIBO RESOURCES (Pty) Ltd
Reg Nr: 2013/099506/07

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FILE REFERENCE NUMBER SAMRAD: KZN 30/5/1/1/2/11230 PR

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

a. 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;
b. identify the alternatives considered, including the activity, location, and technology alternatives;
c. describe the need and desirability of the proposed alternatives,
d. 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 the these aspects to determine:
    i. the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
    ii. the degree to which these impacts—
        (aa) can be reversed;
        (bb) may cause irreplaceable loss of resources; and
        (cc) can be managed, avoided or mitigated;
e. 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—
    i. identify and motivate a preferred site, activity and technology alternative;
    ii. identify suitable measures to manage, avoid or mitigate identified impacts; and
    iii. identify residual risks that need to be managed and monitored.

DOCUMENT CONTROL			
Document Title	Basic Assessment Report and Environmental Management Programme report for Prospecting Right Application for prospecting right for Cobalt, Iron Ore, Nickel Ore and Manganese Ore on portion of portion 1 of the farm Simdlangentsha No. 16956 HU and the whole extent of the farm Bongaspoort 16930 HU situated within the Local Municipality of uPhongolo, under Zululand District Municipality, Kwa-Zulu Natal Province **DMRE REF: KZN 30/5/1/1/2/11230 PR.**		
Version	Version 1:	Draft Basic Assessment Report and Environmental Management Programme (15 July 2022 - 14 August 2022)	
	Version 2:	Final Basic Assessment Report and Environmental Management Programme (August 2022)	
QUALITY CONTROL			
	Compiled By	**Reviewed By**	**Distribution**
Name	N Nkosi	Dr NK Singo	**DMRE Submission**
Designation	Consultant	Principal EAP	

DISCLAIMER

The opinion expressed in this and associated reports are based on the information provided by [CLIENT] to Singo Consulting (Pty) Ltd ("Singo Consulting") and is specific to the scope of work agreed with CLIENT.

Singo Consulting acts as an advisor to the CLIENT and exercises all reasonable skill and care in the provision of its professional services in a manner consistent with the level of care and expertise exercised by members of the environmental profession. Except where expressly stated, Singo Consulting has not verified the validity, accuracy or comprehensiveness of any information supplied for its reports. Singo Consulting shall not be held liable for any errors or omissions in the information given or any consequential loss resulting from commercial decisions or acts arising from them.

Where site inspections, testing or fieldwork have taken place, the report is based on the information made available by the CLIENT or their nominees during the visit, visual observations and any subsequent discussions with regulatory authorities. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Singo Consulting is both complete and accurate. It is further assumed that normal activities were being undertaken at the site on the day of the site visit(s), unless explicitly stated otherwise.

These views do not generally refer to circumstances and features that may occur after the date of this study, which were not previously known to Singo Consulting (Pty) Ltd or had the opportunity to assess.

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ABBREVIATIONS

CA	Competent Authority
CBA	Critical Biodiversity Area
DAFF	Department of Agriculture, Forestry and Fisheries
DEFF	Department of Environmental, Forestry and Fisheries
DMRE	Department of Mineral Resources & Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPR	Environmental Management Programme report
ESA	Ecological Support Area
ESM	Environmental Site Manager
GDP	Gross Domestic Product
GN	Government Notice
GIS	Geographic Information System
GPS	Global Positioning System
GVA	Gross Value Added
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
Mamsl	Meters above mean sea level
MHSA	Mine Health and Safety Act (Act No. 29 of 1996) [as amended]
MPRDA	Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (as amended)
NEMA	National Environmental Management Act, 1998 (Act no 107 of 1998) (as amended)

NEMAQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004) (as amended)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act (Act No. 59 of 2008) (as amended)
NHRA	National Heritage Resource Act, 1999 (Act No. 25 of 1999)
NVFFA	National Veld and Forest Fire Act (Act No. 101 of 1998)
NWA	National Water Act, 1998 (Act No. 36 of 1998) (as amended)
PM	Public Meeting
PPE	Personal Protective Equipment
PPP	Public Participation Process
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards
SAWS	South African Weather Service
SDF	Spatial Development Framework
SLP	Social and Labour Plan
SM	Site Manager
VAC	Visual Absorption Capacity

PART A:

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1. INTRODUCTION

Singo Consulting (Pty) Ltd on behalf of Ulibo Resources (Pty) Ltd submitted an application for a Prospecting Right subject to Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) and an application for an Environmental Authorisation in terms to Chapter 6 of GNR 982 enacted under the National Environmental Management Act (Act 107 of 1998) (NEMA) for Cobalt, Iron Ore, Nickel Ore and Manganese Ore.

The proposed project will aim to ascertain if economically viable mineral deposits exist within the application area. In order to undertake the proposed prospecting activities, Ulibo Resources (Pty) Ltd will require a Prospecting Right in terms of the Mineral and Petroleum Resources Development Act (MPRDA, Act No.28 of 2002). The Applicant is also required to obtain an Environmental Authorisation (EA) in terms of the National Environmental Management Act (NEMA, Act No. 107 of 1998) which involves the submission of a Basic Assessment Report and Environmental Management Programme report (BAR & EMPr).

Singo Consulting (Pty) Ltd has been appointed by Ulibo Resources (Pty) Ltd to manage the Environmental Authorisation process by conducting Environmental Impact Assessment, Public Participation for the proposed project and to compile the Basic Assessment Report and Environmental Management Programme report in support of the Prospecting Right application which in turn will be submitted to the Department of Mineral Resources and Energy for adjudication. This BAR & EMPr has been designed to meet the specifications as set out in the NEMA's 2014 EIA Regulations. Feedback received from stakeholders will form basis of this BAR & EMPr.

Locality Description: The proposed Prospecting Right Application covers portion of Portion 1 and the whole extent of Bongaspoort 16930 HU, encircling a total of 3 410.61 ha. The proposed project area is situated under the jurisdiction of uPhongolo Local Municipality under the Magisterial District of Simdlangentsha. The area of interest is situated approximately 18.13 km north of Louwburg and roughly 32.9 km west of Pongola. It can be accessed from the N2 and join secondary roads which run throughout the project area.

1. Details of the Environmental Assessment Practitioner

Singo Consulting (Pty) Ltd was appointed by Chipo Holdings (Pty) Ltd as an independent EAP to compile this report. The contact details of the consultants who compiled this report are as follows:

Table 1: Details of the Consultant

Name of the Consultant	**Nokuthula Nkosi**
Designation	Consultant
Tel No.	+27 13 692 0041
Cell No.	+27 81 386 8589
Fax No.	+27 86 515 4103
Email	nokuthula@singoconsulting.co.za

Table 2: Details of the EAP who reviewed the report

Name of Practitioner	**: Mr Ndinannyi Kenneth Singo**
Designation	Principal EAP
Tel No.	+27 13 692 0041
Mobile	+27 78 2727 839
Fax	+27 86 5144 103
E-mail	kenneth@singoconsulting.co.za

i) Expertise of the EAP

Please refer to **Error! Reference source not found.** for the Curriculum Vitae.

2. Summary of the EAP's past experience

(In carrying out the Environmental Impact Assessment Procedure)

In the year 2008, Singo Consulting (Pty) Ltd was established as an Independent Consulting Company focused to create opportunities within the Mining and Environmental Industry. With time, Singo Consulting (Pty) Ltd has diversified its services, providing high value Geological, Hydrological, Environmental, Cleaning and Rehabilitation specialized services to clients across a range of industries that are primarily natural resource based.

The company aims to be a consulting firm that communicates sound environmental services solutions. Singo Consulting (Pty) Ltd takes pride in the fact that it holds no equity in any project which in turn permits it to offer clients objective support on crucial issues.

2. Location of the overall Activity

The following table presents the location and associated cadastral details associated with the area in question.

Table 3: Location Details

Farm Name:	**Simdlangentsha No. 16956 HU and Bongaspoort 16930 HU**
Application area (Ha)	3,410.61 ha in extent
Magisterial district:	Simdlangentsha
Distance and direction from nearest town	approximately 18.13 km north of Louwburg and roughly 32.9 km west of Pongola.
21-digit Surveyor General Code for each farm portion	Please refer to the following page for the list of farms and associated SG digit Surveyor General Codes.

Table 4: SG Digit Surveyor General Codes for the Prospecting Area

Farm Name	**Farm Number**	**Portion**	**SG Code**
Simdlangentsha HU	16956 HU	Portion of portion 1	N0HU00000001695600000
Bongaspoort	16930 HU	Entire extent	N0HU00000001693000000

2.1 Regulation & Locality Map (show nearest town, scale not smaller than 1:250,000)

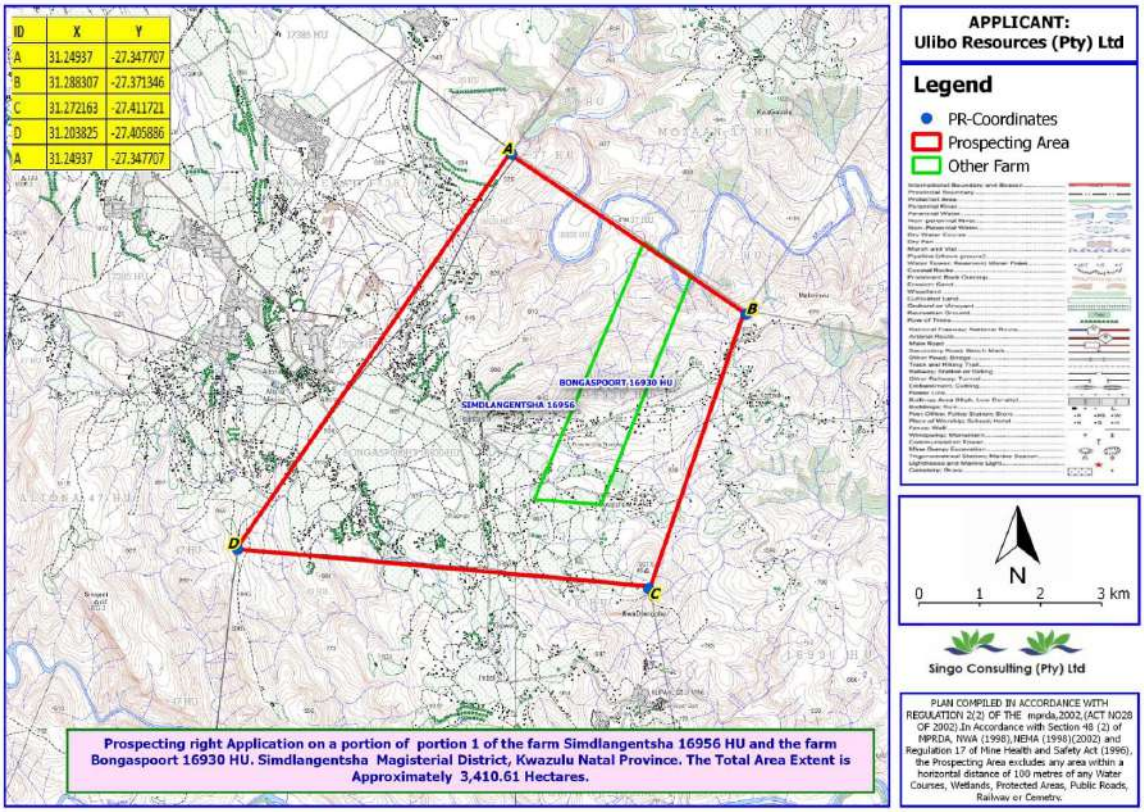


Figure 1: Regulation Map

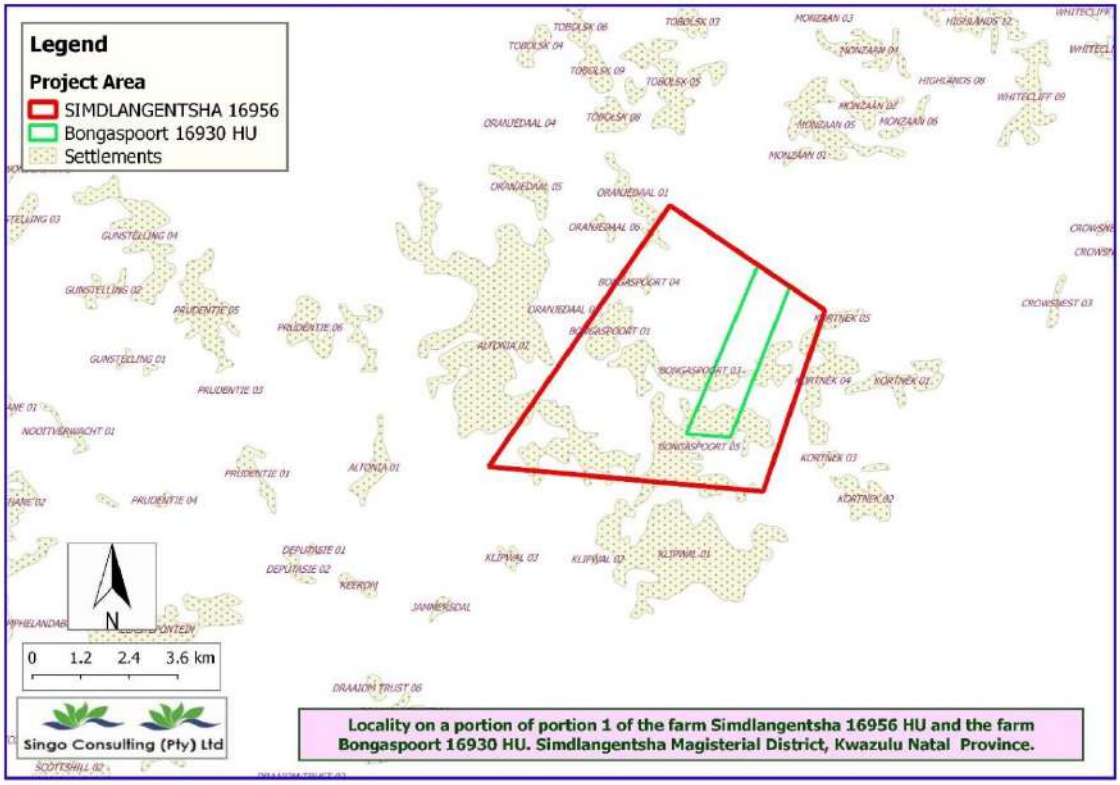


Figure 2: Locality of proposed site project (proposed properties are mapped in red).

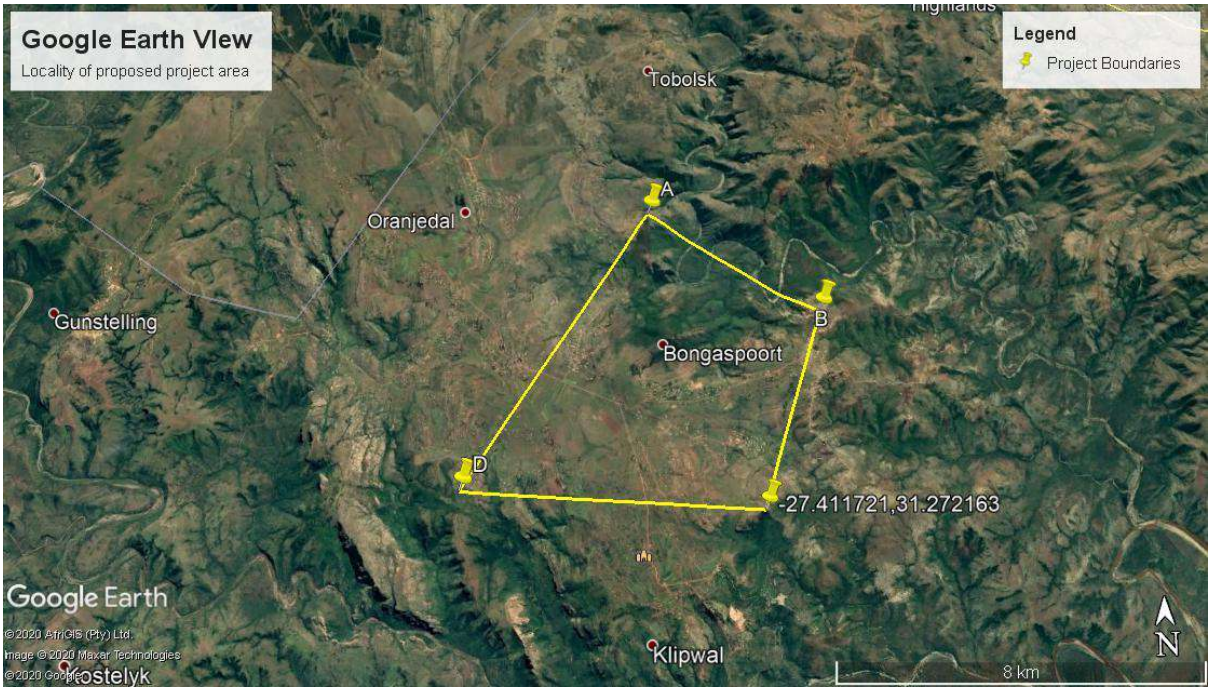


Figure 3: Satellite View of Project Area

Pongola (also known in Zulu as uPhongolo) is a town on the left bank of the Phongolo River, in a fertile valley on the N2, near the Lubombo Mountains, in the valleys of Zululand, easily accessible to the Swaziland border posts. It was part of the Transvaal panhandle between the Phongolo (Natal) and Swaziland (now Eswatini) until 1994, when it was transferred to KwaZulu-Natal.

It is a unique and tranquil subtropical environment. It has more than 50 km² of sugarcane and subtropical fruit plantations surrounding it. During the Depression years of the 1930s, drastic irrigation systems were started in Pongola. The town thrived as a result of the canal system and a sugar mill that was built. Today it is part of the uPhongolo Local Municipality.

Pongolapoort Dam and Pongola Game Reserve is to the east. It is the only dam in South Africa where you can catch African tigerfish (family Alestidœ). Pongola is surrounded by hunting lodges and several have even the Big Five. Some farms specialize in biltong hunting and others concentrate on trophy hunting.

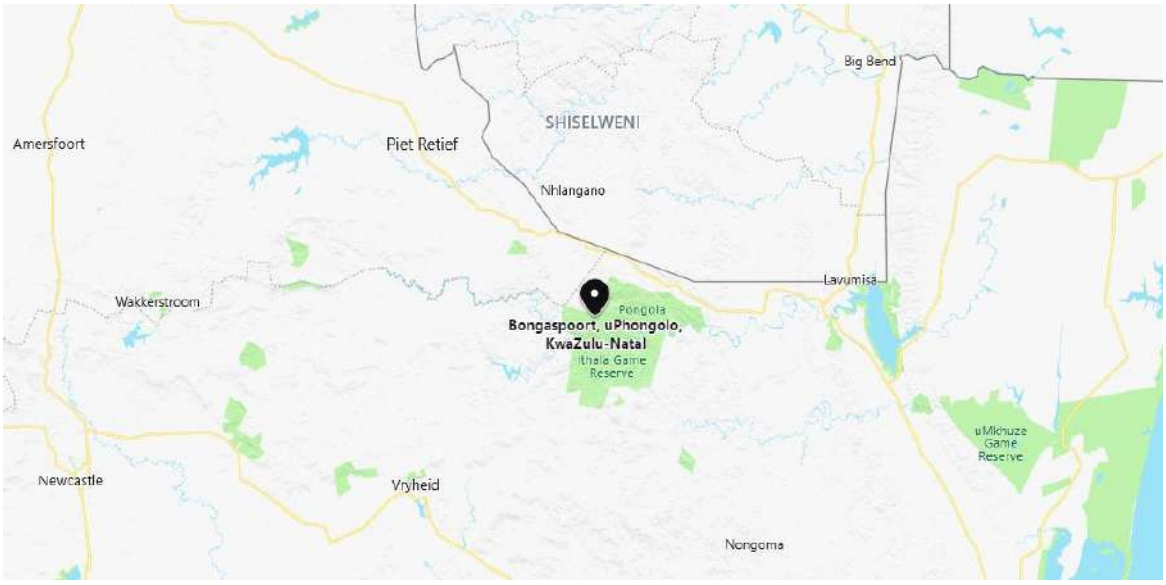


Figure 4: Towns, provinces and countries surrounding proposed project area.

The project is located within the Magisterial District of Simdlangentsha, under the jurisdiction of the uPhongolo Local Municipality, located within Zululand District Municipality. The uPhongolo Local Municipality is a Category B municipality located in the north of the Zululand District in KwaZulu-Natal. It lies adjacent to the Swaziland Border and the Mpumalanga Province Border. It is one of five municipalities in the district. The main access to the municipality is via the N2 from Gauteng in the north-west and Durban in the south. The municipality provides regional access to a wide range of tourist activities outside its own boundaries. There are two main rivers within the municipality namely the Mkuze River in the south and the Pongola River in the north, the latter feeding the Pongolapoort Dam located on the eastern boundary of the municipality.

Figure 5: Road network around proposed project area

The proposed project area is near the provincial boarder of Mpumalanga and may be accessed using the N2 embarking from Piet Retief, Mpumalanga. Secondary roads and farm roads are then used to further navigate to the proposed project area.

3. Description of the scope of the proposed overall activity

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

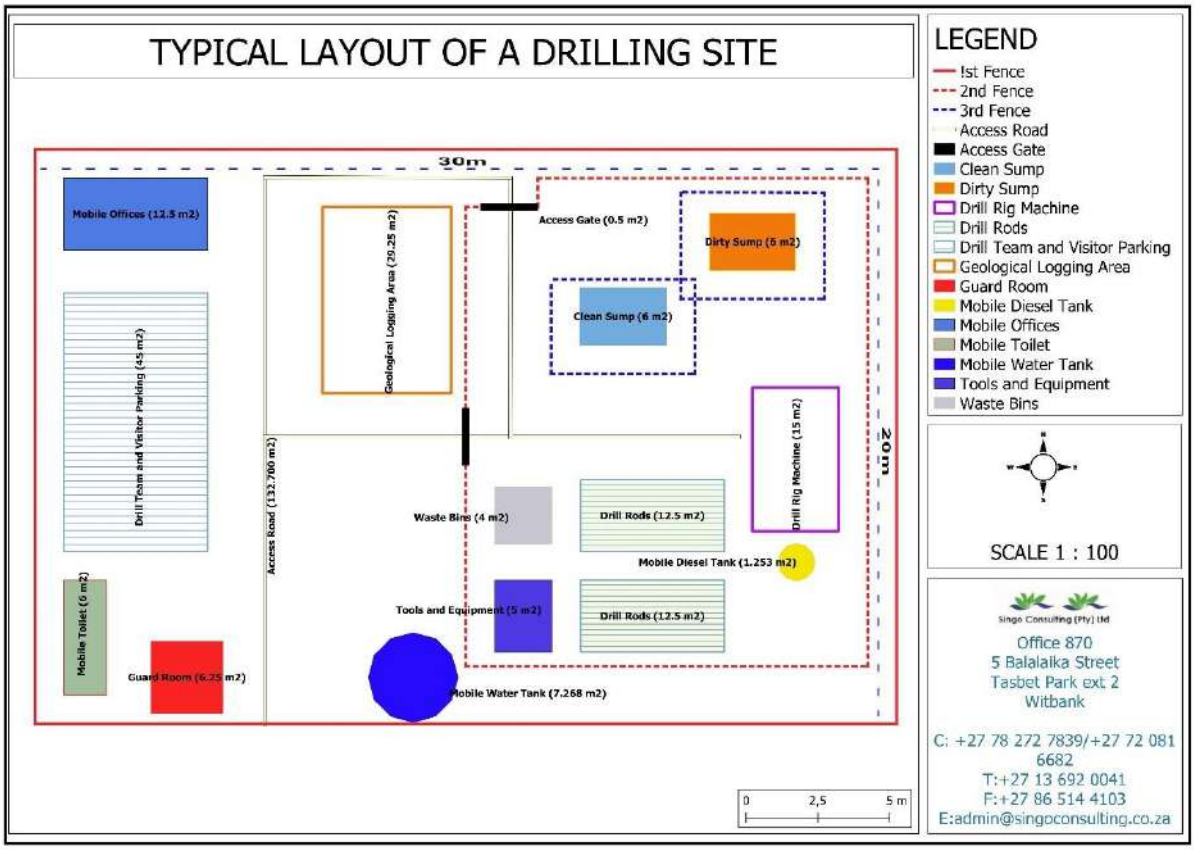


Figure 6: General layout of prospecting site and activities

1. Description of the Activities to be Undertaken

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

Activities for the prospecting of Ulibo Resources (Pty) Ltd will be done in three phases. The Proposed Prospecting area as depicted above clearly showing the areas of interest.

A total number of proposed boreholes to be drilled for the operation is fifteen (15). Vegetation will be cleared at each drilling site and progressing rehabilitation will take place after each drill site. The total vegetation clearing for the overall activities is 0.9 ha. The Proposed project area will be accessed through the currently existing roads and only where necessary and with the agreement of the landowner. Access within the farm will be communicated with the respective Landowner.

As part of the proposed Prospecting Work Program (PWP), both non-invasive and invasive prospecting activities will be conducted. The framework will adopt a staggered strategy, where the work program for prospecting is split into several sequential phases.

There will be a brief period at the end of each phase to compile and review outcomes. The findings will decide not only whether prospecting progresses but also how it will proceed. The applicant will only take action over the next prospecting phase once satisfied with the results obtained in the previous phases. Moreover, if need arises, smaller, non-core parts of the prospecting work program will be undertaken. A detailed descriptive of the invasive and non-invasive activities planned is presented below.

Site establishment

This is the mobilisation of all project equipment to the site or a nearby location in order to conduct efficient prospecting. There is very little environmental impact with regards to this. Rehabilitation will take place progressively per drill site. Site Establishment includes:

Access Roads

Access to the site will be required during pegging of holes, and drilling activities (Phase 2 and 3). Several existing roads and tracks already traverse the proposed prospecting site and where practicable, these roads will be used. During pegging activities, vehicle access will have gained to site through the veld and the establishment of a track to gain repeated access to a borehole site will not be required. Once drill sites have been identified, temporary access roads may be established for repeated access to the drill site if the identified drill site cannot be accessed via existing roads and tracks.

Water Supply

Water tanks /portable water will have to be brought on site from nearby suppliers.

Photo 1: Typical example of water storage

Ablution

Ablution facilities at the drill site will involve the installation of drum or tank type portable toilets.

Photo 2: Typical example of a mobile toilet to be adopted

Temporary Office Area

A temporary site office shaded area will be erected at the drill sites. No on-site electricity generation using generators will be undertaken. Meals will be provided to the staff and workers as no heating and / or cold storage facilities will be available. A shaded eating area will be provided.

Photo 3: Typical example of shaded office area

Accommodation

No accommodation for staff and workers will be provided on-site and all persons will be accommodated in nearby towns (i.e. Pongola, Simdlangetsha). Workers will be transported to and from the prospecting site daily. Night security staff will be employed once equipment has been established on site.

Blasting

As the Prospecting Works Programme for this particular application does not allow for bulk sampling, no blasting will take place.

Storage of Dangerous Goods

During the drilling activities limited quantities of diesel fuel, oil and lubricants will be stored on site. The only dangerous goods that will be stored in any significant quantity is diesel fuel. A maximum amount of 60 m^3 will be stored in above ground diesel storage tanks.

Photo 4: Typical example of diesel storage

The detailed geology and cobalt, iron ore, nickel ore and manganese ore potential of the area is relatively known, and as such exploration work will commence from a very advanced level. The Prospecting Work Programme is designed in phases and the prospecting activities will be conducted over a period of five years. Each phase is conditional on the success of the previous phase and will include:

Phase 1: Data acquisition and a Desktop study

A desktop study of all available data for the area will be undertaken to accumulate as much regional and historical data around the area as possible. This includes published geological reports, infrastructure mapping, satellite imagery and existing geophysical information (if available).

Phase 2: Drilling

Targets that have been prioritised through detailed desktops will be tested by initial diamond or percussion drilling.

It should be noted that no bulk sampling will be undertaken as part of this Prospecting Works Programme. Should the initial evaluation of the deposit indicate a sufficient size and grade, bulk sampling may be required. In this event, the Prospecting Works Programme will be amended, and a new Environmental Authorisation Process will be required for submission to the DMR.

Phase 3: Drilling and Reconnaissance Resource Generation

If the present application is approved and areas with possible targets for the minerals applied for, this identified prospective target will require further subsurface investigation. Diamond drilling of the prospective areas will commence to establish presence of mineralization. Geological borehole logging, down the hole logging and sampling will also be carried out. Whole rock analysis of all the potential intersections will be carried out. For budgeting purposes, it is assumed that every meter of the initial holes will be analysed. It is anticipated that initially approximately 15 boreholes will be drilled. Drill holes could vary in depth from 25m to 110m. The total amount of drilling to be budgeted for at this stage is 110 meters.

Table 5: Summary of Drilling Activity

Drilling method	Diamond core drilling
Number of boreholes	15
Depth of boreholes	110m
Duration of drilling	A borehole takes about 2 days to complete; 15 boreholes will take at least 30 days.
Demarcated working area	0.09 ha for all 15 drilling sites
Total area to be disturbed	0.09 ha of 3 410.61 ha

Phase 4: Resource Drilling, Sampling and Analysis, Resource Estimation and Prefeasibility Study

Dependent on the results of Phase 3 drilling further 2 drill-holes totalling between 100-700 meters may be required. The geological information generated will be used to model and estimate resource. The resources will at least be expected to be in the Indicated Category according to the appropriate reporting standard (SAMREC, JORC, or NI43 -101).

Phase 5: Feasibility Study

The final phase of the prospecting programme would involve preparation of a Feasibility study. This would include:

- Resource drilling
- Geological Modelling
- Initial conceptual Mine Planning.
- Planning the infrastructure requirements
- Environmental management planning
- Financial modelling
- Market analysis
- Analysis of transport logistics to markets
- Assessment of personal and training requirements
- Assessment of socio-economic factors

A feasibility study is multidisciplinary in nature and requires the highest levels of expertise available. Such studies are both costly and time consuming

All listed activities will be done or performance within the radius of 30m*20m=600m²

The activities associated with the Prospecting Work Programme will be scheduled over a period of five years as is detailed in the following table:

Table 6: Prospecting Timeframes and Activities

Phase	Activity (What are the activities that are planned to achieve optimal prospecting)	Skill(s) required (Refers to the competent personnel that will be employed to achieve the required results)	Timeframe (In months) for the activity)	Outcome (What is the expected deliverable, e.g., Geological report, analytical results, feasibility study, etc.)	Timeframe for outcome ((deadline for the expected outcome to be delivered)	What technical expert will sign off on the outcome? (e.g., geologist, mining engineer, surveyor, economist, etc)
Phase1: Invasive Prospecting						
	Diamond drilling (5 boreholes) Sampling	Exploration Geologist Exploration Geologist	Month 1 (30 days)	Borehole core data ore samples Rock core samples Core analyses Rock core analyses	Month 1 Month 2 – 3	Exploration Geologist Laboratory analyst
Phase 1: Non-invasive Prospecting						
	Consultations with landowners	Land Tenure Specialist	Month 1	Legal Access Agreement	Month 1	Land Tenure Specialist
	Data processing and validation	Exploration Geologist	Month 7-8	Stratigraphic correct borehole data Analytical correct borehole data	Month 8 – 10 Month 8 - 10	Exploration Geologist /Database administrator Exploration Geologist /Database administrator
	Lithofacies and ore quality modelling	Exploration Geologist	Month 10-12	Contour maps Reserve breakdown	Month 10-12	Exploration Geologist /Modeller
	Inspection/Consultation with landowners	Land Tenure Specialist /Drilling contractor	Month 5-6	Rehabilitation clearance certificate	Month 5 - 6	Land Tenure Specialist / Environmental officer
Phase 2: Invasive Prospecting						

	Diamond drilling (5 borehole)	Exploration Geologist	Month 13	Borehole core data core samples Rock core samples Core analyses Rock core analyses	Month 13 Month 13-14	Exploration Geologist Laboratory analyst
	Geophysical survey (Optional)	Geophysicist Exploration Geologist	Month 13-15	Lithology data Structural data	Month 13-14	Geophysicist
	Geohydrological survey (Optional)	Geohydrologist Exploration Geologist	Month 13-14	Borehole water yield Water samples	Month 17-20	Geohydrologist
Phase 2: Non-invasive Prospecting						
	Consultation with landowners	Mining Rights officer	Month 12	Legal Access Agreement	Month 12	Land Tenure Specialist
Phase	**Activity**	**Skill(s) required**	**Timeframe**	**Outcome**	**Timeframe for outcome**	**What technical expert will sign off on the outcome?**
	Data processing and validation	Exploration Geologist	Month 17-18	Stratigraphic correct borehole data Analytical correct borehole data	Month 20 – 22 Month 20 - 22	Exploration Geologist /Database administrator Exploration Geologist /Database administrator
	Lithofacies and ore quality modelling	Exploration Geologist	Month 22-24	Contour maps Reserve breakdown	Month 22-24	Exploration Geologist /Modeler
	Inspection/Consultation with landowners	Mining Rights officer	Month 16-17	Rehabilitation clearance certificate	Month 16 - 17	Land Tenure Specialist / Environmental officer
Phase 3: Invasive Prospecting						

	Diamond drilling (5 borehole)	Exploration Geologist	Month 25	Borehole core data core samples Rock core samples core analyses Rock core analyses	Month 25 Month 25-60	Exploration Geologist Laboratory analyst
	Directional drilling (Optional)	Exploration Geologist	Month 24-30	Lithological data	Month 24-60	Exploration Geologist
	Geophysical survey (Optional)	Geophysicist Exploration Geologist	Month 25-27	Lithology data Structural data	Month 25-60	Geophysicist
	Geohydrological survey (Optional)	Geohydrologist Exploration Geologist	Month 25-26	Borehole water yield Water samples	Month 29-60	Geohydrologist
Phase 3: Non-invasive Prospecting						
	Consultation with landowners	Mining Rights officer	Month 24	Legal agreement	Month 24	Land Tenure Specialist
	Data processing and validation	Exploration Geologist	Month 29-30	Stratigraphic correct borehole data Analytical correct borehole data	Month 32 – 60 Month 32 - 60	Exploration Geologist /Database administrator Exploration Geologist /Database administrator
	Lithofacies and Ore	Exploration Geologist	Month 34-36	Contour maps Reserve breakdown	Month 34-60	Exploration Geologist /Modeler
	Inspection/consultation with landowners	Land Tenure Specialist	Month 28-29	Rehabilitation clearance certificate	Month 28 - 60	Land Tenure Specialist / Environmental officer

As is clear from the information provided above, each of the phases is dependent on the results of the preceding phase. The location and extent of drill sites, and possible diamond drilling can therefore not be determined at this stage. Mapping of the prospecting activities could thus not be undertaken. In the subsequent sections (Section ii) more details are provided in terms of each of the prospecting activities.

The applicant must submit a plan indicating the location of drilling activities, once these areas have been finalized to at all landowners, as well as the Department of Mineral Resources and Energy and the Department of Water and Sanitation.

Figure 7: Typical examples of drill rig site

2. Listed and specified activities

Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) requires, upon request by the Minister that an Environmental Management Plan be submitted, and that the applicant must notify and consult with Interested and Affected Parties (I&APs). Section 24 of the NEMA requires that activities, which may impact on the environment must obtain an environmental authorisation from a relevant authority before commencing with the activities. Such activities are listed under Regulations Listing Notice 1 GNR 517. The proposed prospecting activity triggers:

NEMA Government Notice 517: Listing Notice 1:

Activity 20: "Any activity including the operation of that activity which requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource…"

Please refer to the following table for the details in terms of the listed activities.

Table 7: 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, 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 517, June 2021	**WASTE MANAGEMENT AUTHORISATION** (Indicate whether an authorisation is required in terms of the Waste Management Act). **(Mark with an X)**
Prospecting application	3 410.61 ha	**X**	GNR 517, Listing Notice 1, Activity 20.	Not required
Vegetation clearing	20*30=600 m² *15 boreholes=9 000m² 9 000 m²÷10000=0.9 ha Less than 20 ha		Not listed	
Site camp	600 m²		Not Listed	
Drilling	0.9 ha to be disturbed per site			
Temporary road creation	300 m²	**X**	GNR 517, Listing Notice 1, Activity 20.	

The above calculations resemble that, drilling 15 boreholes will only disturb 0.9 ha of the applied area (3 410.61 ha). The areas will be rehabilitated immediately.

4. Policy and Legislative Context

Table 8: Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT
National Heritage Resources Act, 1999	Management measures	Should archaeological artefacts or skeletal material be revealed in the area during development activities, such activities should be halted, and SAHRA notified in order for an investigation and evaluation of the find(s) to take place.
National Environmental Management (No. 107 of 1998) (NEMA)	This entire report is prepared as part of the prospecting right application under the NEMA, section 24	The application is for a prospecting right and therefore all regulations pertaining to the application process of a prospecting right and environmental management are applicable to this application. DMRE REF: KZN 30/5/1/1/2/ 11230 PR
National Water Act (No. 36 of 1998) (NWA): Water may not be used without prior authorisation by the DWS. Section 21 of the National Water Act (No.36 of 1996) the NWA water uses for which authorisation is required.	No Water Use Licence has been applied for this prospecting project.	No water use license is required for this Application. The water required will be bought from the municipality or licensed water supplier that sells potable water or treated industrial water for which a water sale agreement will be drawn and agreed upon before work commences. Appropriate dust extractions /suppression

		equipment will be a condition imposed on the drill contractor for their drill rigs
Mineral and Petroleum Resources Development Act (No. 28 of 2008)	This entire report is prepared as part of the Prospecting Right Application under the MPRDA, section 16(2).	The application is for a prospecting right and therefore all regulations pertaining to the application process of a prospecting right and environmental management are applicable to this application. DMRE REF: KZN 30/5/1/1/2/ 11230 PR
The National Environmental Management: Biodiversity Act (Act No. 10 of 2004 – NEMBA) Section 57 and 87	Regulations published under NEMBA provides a list of protected species (flora and fauna), according to the Act (GN R. 151 dated 23 February 2007, as amended in GN R. 1187 dated 14 December 2007) which require a permit in order to be disturbed or destroyed	No applications have been submitted in terms of the National Environmental Management: Biodiversity Act.
Constitution of South Africa, Specifically, everyone has the right: a) to an environment that is not harmful to their health or wellbeing; and	BAR & EMPr	Prospecting activities will only proceed after effective consultation. All activities will be conducted in a manner that

b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that i) prevent pollution and ecological degradation; ii) promote conservation; and iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.		does not violate the Constitution of the Republic of South Africa.
Municipality By-Laws: Waste Management by-law Act 59 of 2008, Air Quality Management By-law Act 39 of 2004, Noise control by-law, Spatial Planning and Land Use Management act no 16 of 2013 (SPLUMA).	Environmental Management measures awareness plan	Best practice guidelines will be followed for any by-law's management and the development of the mine environmental and other legislative management.
uPhongolo Local Municipality Integrated Development Plan (IDP) SDC: Record & Information Management Unit Department of Rural Development and Land Reform: Kwa-Zulu Natal Email: LYNN BOUCHER lynn.boucher@drdlr.gov.za	Need and desirability socio – economic needs	Incorporated in Section ***

Strategic Development Framework (SDF)	Land Use	In terms with the SDF of the uPhongolo Local Municipality, looks to create a spatial structure with integrated and functional nodal areas, which promotes the sustainable utilisation of rural and agricultural land, biophysical and infrastructural resources for the economic and social growth of the uPhongolo Local municipality. The municipality aims to: • Provide strategic guidance for the future development of the uPhongolo Municipality and a planning base for the coordination and integration of all future activities aimed at improving the situation within the uPhongolo Municipality Focuses on effective, optimised land usage within the broader context of protecting the existing values of the Municipality environs, i.e. as a tourism destination and a rich historical and cultural area • The land use management system aims to provide a secure environment for investment and ensure the appropriate and effective use of land through spatial planning initiatives and the implementation of the outcomes thereof

5. Need and desirability of the proposed activities

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

Mining in South Africa directly contributed to the establishment of the Johannesburg Stock Exchange in the late 19th century, and today it still accounts for a large portion of its market capitalization. From this, it is clear that mining in South Africa has shaped the country politically, culturally, and economically and that the South African mining sector has provided the critical mass for a number of industries that are either suppliers to the mining industry, or users of its products. These include, but are not limited to, energy, financial services, water and engineering services, and specialist seismic geological and metallurgical services. The proposed cobalt, iron ore, nickel ore and manganese ore prospecting right will not only contribute directly to the South African economy but will also contribute to the development and growth of other industries supporting the mining sector.

The definition of Prospecting in terms of the MPRDA states: "intentionally searching for any mineral by means of any method which disturbs the surface or subsurface of the earth, including any portion of the earth that is under the sea or under other water…".

The proposed prospecting right in search for cobalt, iron ore, nickel ore and manganese ore resources that is prior to mining project, will contribute to favourable economic impacts on a local, regional, and national scale. This will result in numerous job creation, skills development opportunities and provide an economic injection in the region. If the project does not proceed; the additional economic activity, skills development and available jobs will not be created, and the mineral reserves would remain unutilized and unknown.

The above-mentioned minerals, which are being prospected, are important in numerous industries and have a number of uses of which all are beneficial to people. Some of the most important uses are as follows:

- Cobalt
    - A magnetic metallic element that is used especially in alloys, in batteries, and as a pigment in paint and glass
    - Can be magnetised and so is used to make magnets. It is alloyed with aluminium and nickel to make particularly powerful magnets.
    - Other alloys of cobalt are used in jet turbines and gas turbine generators, where high-temperature strength is important.
    - Sometimes it can be used in electroplating because of its attractive appearance, hardness and resistance to corrosion.

- Cobalt salts have been used for centuries to produce brilliant blue colours in paint, porcelain, glass, pottery and enamels.
- Radioactive cobalt-60 is used to treat cancer and, in some countries, to irradiate food to preserve it.

- Iron Ore
  - A silver-white malleable ductile magnetic heavy metallic element that readily rusts in moist air, occurs in pure form in meteorites and combined in most igneous rocks, is the most abundant element on Earth by mass, and is vital to biological processes
  - It is an enigma – it rusts easily, yet it is the most important of all metals. 90% of all metal that is refined today is iron.
  - Most is used to manufacture steel, used in civil engineering (reinforced concrete, girders etc) and in manufacturing.
  - There are many different types of steel with different properties and uses. Ordinary carbon steel is an alloy of iron with carbon (from 0.1% for mild steel up to 2% for high carbon steels), with small amounts of other elements.
  - Alloy steels are carbon steels with other additives such as nickel, chromium, vanadium, tungsten and manganese. These are stronger and tougher than carbon steels and have a huge variety of applications including bridges, electricity pylons, bicycle chains, cutting tools and rifle barrels.
  - Stainless steel is very resistant to corrosion. It contains at least 10.5% chromium. Other metals such as nickel, molybdenum, titanium and copper are added to enhance its strength and workability. It is used in architecture, bearings, cutlery, surgical instruments and jewellery.
  - Cast iron contains 3–5% carbon. It is used for pipes, valves and pumps. It is not as tough as steel but it is cheaper. Magnets can be made of iron and its alloys and compounds.
  - Iron catalysts are used in the Haber process for producing ammonia, and in the Fischer–Tropsch process for converting syngas (hydrogen and carbon monoxide) into liquid fuels.
- Nickel Ore
  - a silver-white hard malleable ductile metallic element capable of a high polish and resistant to corrosion that is used chiefly in alloys and as a catalyst
  - Nickel resists corrosion and is used to plate other metals to protect them. It is, however, mainly used in making alloys such as stainless steel. Nichrome is an alloy of nickel and chromium with small amounts of silicon, manganese and

iron. It resists corrosion, even when red hot, so is used in toasters and electric ovens. A copper-nickel alloy is commonly used in desalination plants, which convert seawater into fresh water. Nickel steel is used for armour plating. Other alloys of nickel are used in boat propeller shafts and turbine blades.

- Nickel is used in batteries, including rechargeable nickel-cadmium batteries and nickel-metal hydride batteries used in hybrid vehicles.
- Nickel has a long history of being used in coins. The US five-cent piece (known as a 'nickel') is 25% nickel and 75% copper.
- Finely divided nickel is used as a catalyst for hydrogenating vegetable oils. Adding nickel to glass gives it a green colour.

- Manganese Ore
  - A grayish-white usually hard and brittle metallic element that resembles iron but is not magnetic and is used especially in alloys, batteries, and plant fertilizers
  - It is too brittle to be of much use as a pure metal. It is mainly used in alloys, such as steel.
  - Steel contains about 1% manganese, to increase the strength and also improve workability and resistance to wear.
  - Manganese steel contains about 13% manganese. This is extremely strong and is used for railway tracks, safes, rifle barrels and prison bars.
  - Cans for drinks are made of an alloy of aluminium with 1.5% manganese, to improve resistance to corrosion. With aluminium, antimony and copper it forms highly magnetic alloys.
  - Manganese(IV) oxide is used as a catalyst, a rubber additive and to decolourise glass that is coloured green by iron impurities. Manganese sulfate is used to make a fungicide. Manganese(II) oxide is a powerful oxidising agent and is used in quantitative analysis. It is also used to make fertilisers and ceramics.

The minerals that are being prospected have the potential to supply local & regional markets. After prospecting activities, which is the thorough search of a mineral through core drilling, it will be accessed if mining the above minerals will be viable not only for the company but also for the community. The success of the project will contribute to the economic development in the local municipal area.

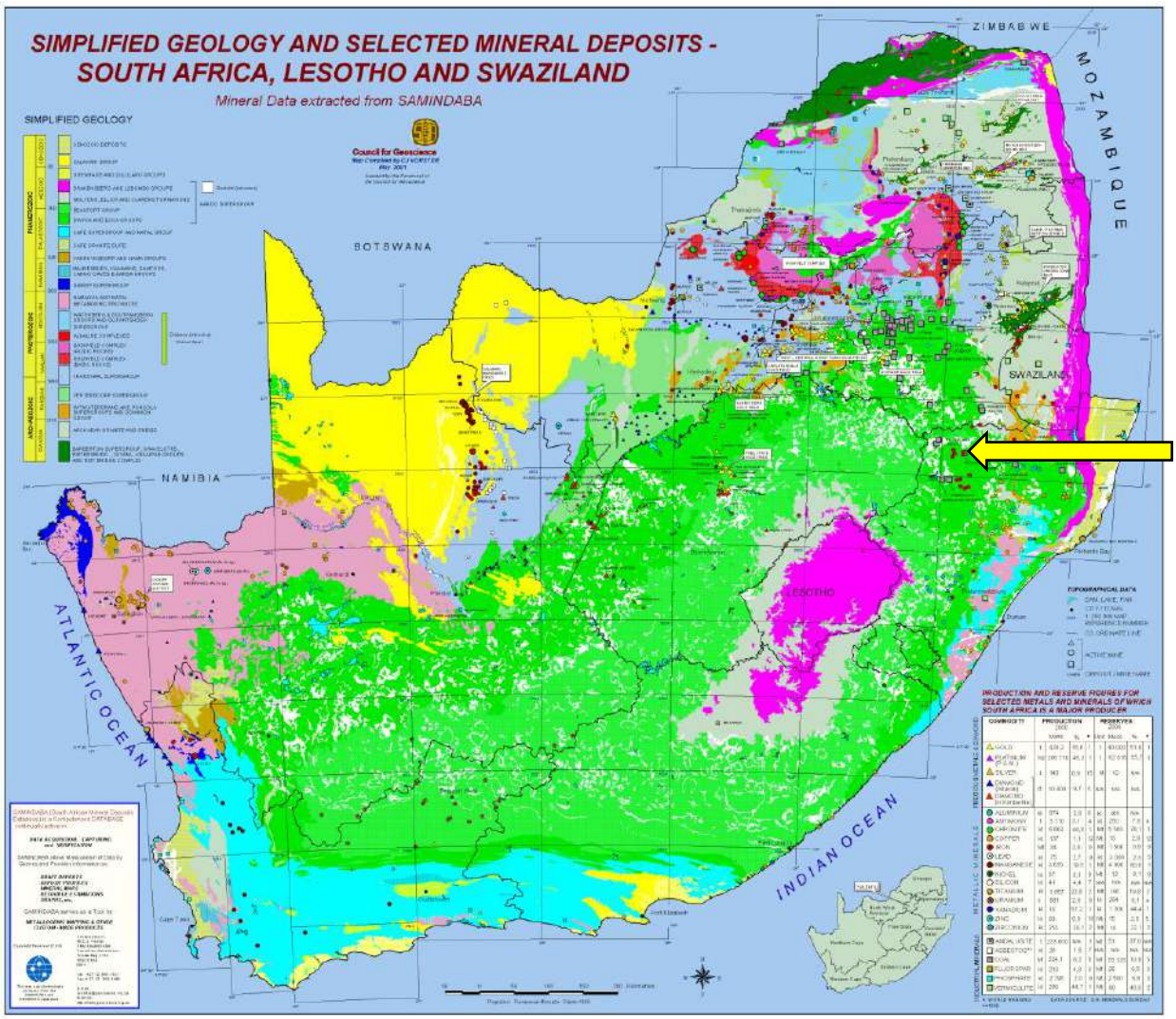
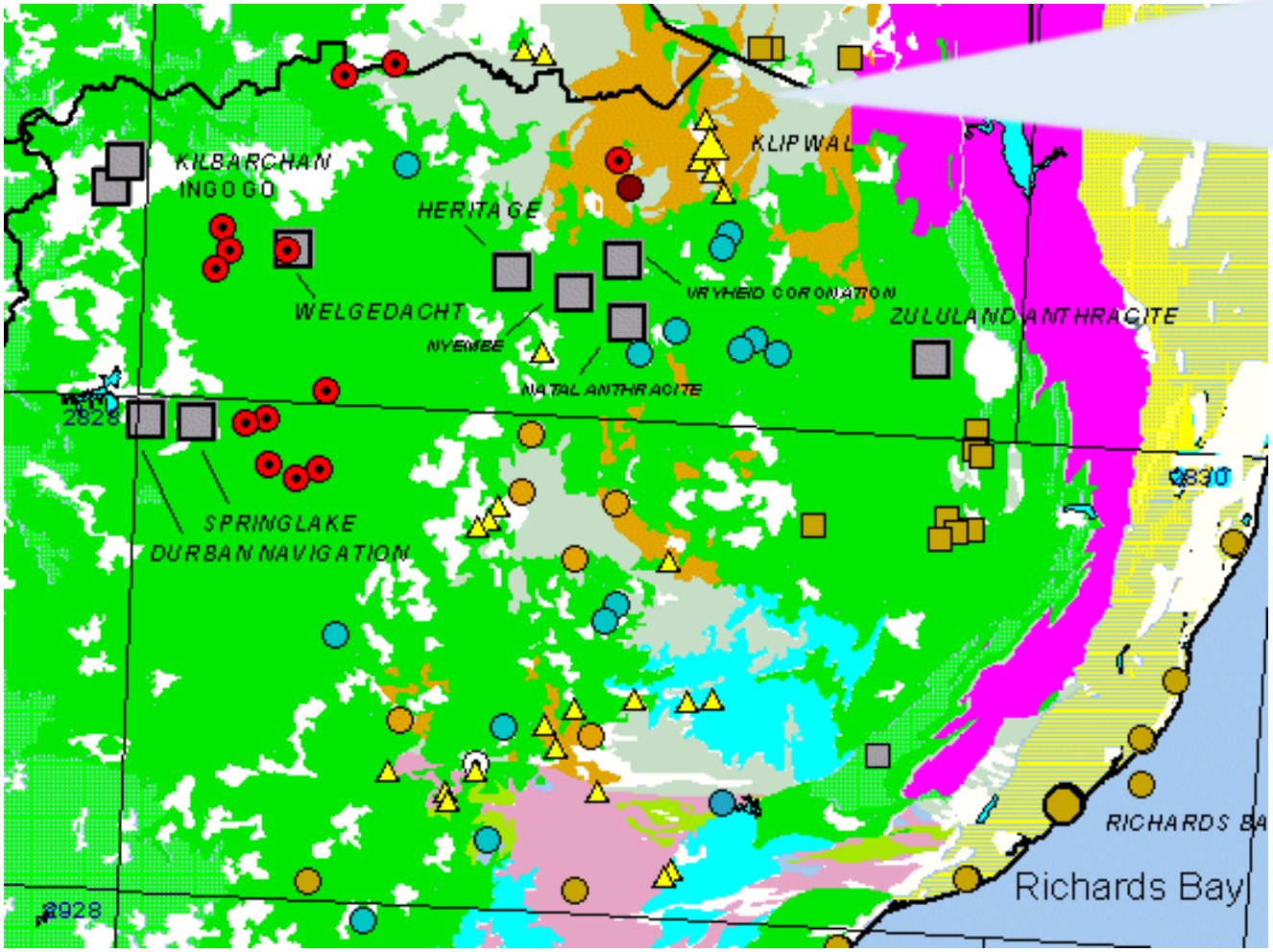


Figure 8: South Africa's Mineral Map (Source: Geoscince.org)



PRODUCTION AND RESERVE FIGURES FOR SELECTED METALS AND MINERALS OF WHICH SOUTH AFRICA IS A MAJOR PRODUCER

	COMMODITY	PRODUCTION 2000 Mass	%	*	RESERVES 2000 Unit	Mass	%	*
PRECIOUS METALS & DIAMOND	GOLD	t 428,2	16,6	1	t	40 000	51,9	1
	PLATINUM (P.G.M.)	kg 206 770	46,2	1	t	62 816	55,7	1
	SILVER	t 145	0,9	15	Kt	10	N/A	
	DIAMOND (Alluvial)	ct 10 600	9,7	5	N/A	N/A	N/A	
	DIAMOND (in Kimberlite)							
METALLIC MINERALS	ALUMINIUM	kt 674	2,8	8	Kt	699	N/A	
	ANTIMONY	t 3 710	3,1	4	Kt	250	7,8	4
	CHROMITE	kt 6 662	44,8	1	Mt	5 500	76,1	1
	COPPER	kt 137	1,1	12	Mt	13	2,0	12
	IRON	Mt 34	3,6	8	Mt	1 500	0,9	9
	LEAD	kt 75	2,7	9	Kt	3 000	2,3	5
	MANGANESE	kt 3 655	19,5	1	Mt	4 000	80,0	1
	NICKEL	kt 37	3,1	9	Mt	12	8,1	6
	SILICON	kt 41	4,4	7	N/A	N/A	N/A	N/A
	TITANIUM	kt 1 057	22,8	2	Mt	146	19,8	2
	URANIUM	t 661	2,0	9	Kt	294	9,1	4
	VANADIUM	kt 18	57,2	1	Kt	1 200	44,4	1
	ZINC	kt 83	0,8	18	Mt	15	3,5	5
	ZIRCONIUM	kt 253	28,1	2	Mt	14	22,1	2
INDUSTRIAL MINERALS	ANDALUSITE	t 233 000	N/A	1	Mt	51	37,0	N/A
	ASBESTOS**	kt 26	1,5	7	N/A	N/A	N/A	N/A
	COAL	Mt 224,1	6,2	6	Mt	55 333	10,9	5
	FLUORSPAR	kt 213	4,8	3	Mt	36	9,5	3
	PHOSPHATE	kt 2 796	2,0	9	Mt	2 500	6,8	3
	VERMICULITE	kt 209	44,7	1	Mt	80	40,0	2

* WORLD RANKING ** 1999 DATA SOURCE: S.A. MINERALS BUREAU

Figure 9: Kwa-Zulu Natal Mineral Map (Source: Geoscience.org)

NEED AND DESIRABILITY OF THE PROPOSED PROJECT		
PART I: NEED		
Questions (Notice 792, NEMA, 2012)		Answers
1.	Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority?	Prospecting is an integral part of its rationale to make use of the abundant natural resources in the area to create strong, resilient, and prosperous district. The key natural assets/resources have been identified and analysed as being sugarcane and citrus fruit farming as well as tourism in respect of game reserves. A small-scale mining operation has also been identified although it only contributes about 2% of the entire workforce in the Municipality.
2.	Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occurs here at this point in time?	Should a mining right be applied for and be approved in future, the integrity of the existing environmental management priorities of the area may be compromised, and a full Environmental Impact Assessment must then be conducted to determine the sustainability of the mining activities. The proposed project has the potential to have a positive impact on the socio-economic conditions of the local communities involved as well as for gathering information about the geographical layout of the area. Should the results of the prospecting show that feasible reserves are present to mine, a mining right may be approved.
3.	Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.	According to the Draft IDP (2022/2023), the employment hat 17% of the population is unemployed, that 30% of the population is employed, 53% of the population is not economically active. Should the Ulibo Resources (Pty) Ltd prospecting yield positive impact on the socio-economic conditions especially if it

		graduates to mining, by creating more jobs and providing developments to the local communities.
4.	Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development?	All infrastructure for services and capacity will be temporary and will be provided for the proposed prospecting/drilling activities. Temporary Infrastructure includes i.e Mobile toilets, temporary shaded area (in a form of Gazebo). Drilling mechanisms to be employed will be of diamond core drilling. The road networks are fully intact, and the project will not have a major impact on road congestion. Thus, additional capacity does not need to be created for the development.
5.	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?	The development is not provided for in the infrastructure planning of the municipality as it is a small development of local importance. Thus, the proposed project will not have any implications for the infrastructure planning, as no services and/or infrastructure needs to be upgraded or created to cater for this project. The proposed project will be making use of mobile structures.
6.	Is the project part of a national programme to address an issue of national concern or importance?	The mining sector is a significant contributor to the National GDP as well as a massive employer of people. This project will contribute to the National Development Plan of eradicating poverty/unemployment. Chapter 6 of the National Development Plan highlights an "inclusive rural economy" and the objectives of this plan are to create jobs in mining and industry and activating rural economies through service to small and micro mining.
PART II: DESIRABILITY		

7.	Is the development the best practicable environmental option for this land/site?	The project area lies on heavily modified land. The activities currently present on site have already had an impact on environmental management. The disturbed areas (drill sites) will be rehabilitated immediately after prospecting activities.
8.	Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	The approval of this prospecting application will not compromise the integrity of the existing environmental management priorities of the area provided that sensitive areas are avoided and the mitigation measures as recommended in this report and in the EMPr are implemented.
9.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	The integrity of the existing environmental management priorities for the area will not be compromised by this development.
10.	Do location factors favour this land use at this place? (This relates to the contextualization of the proposed land use on this site within its broader context).	The Pongola Supergroup is a meso-Archaean volcano-sedimentary succession that outcrops in south-eastern Mpumalanga, northern KwaZulu Natal and Swaziland It is divided into two distinct sequences - the lower Nsuze Group and the upper Mozaan Group. The Nsuze Group is mainly composed of volcanic rocks while sedimentary rocks dominate the Mozaan Group. The planned drilling activities does not need any new infrastructure. In addition, the study area proposed for prospecting is in close proximity to Klipvaal Mine.
11.	How will the activity of the land use associate with the activity being applied for, impact on sensitive natural and cultural	As far as the Basic Assessment on the area of question, there is no known heritage or cultural significance. Should the standings change, the relevant authority will be notified immediately and information will be included into the BAR & EMPr.

	areas (built and rural/natural environment)?	
12.	How will the development impact on people's health and well-being? (E.g. In terms of noise, odours, visual character and sense of place, etc.)?	The impacts on well-being, following mitigation, will be as follows: • Visual: Medium to low • Dust: Low • Noise: Low • Vibrations: Low Strict adherence to the recommendations & mitigation measures identified will be ensured.
13.	Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs?	The dominant mining activity in KwaZulu-Natal as per the total mined commodity types, is the mining of sand and other aggregates with 97 operating mines, followed by the mining of coal (anthracite and bituminous) with 14 operating mines, and by titanium (including titanium concentrate, zircon concentrate, iron bp manganese and titanium slag) with 4 operating mines.
14.	Will the proposed land use result in unacceptable cumulative impacts?	The proposed project has only been identified to have minimal cumulative impacts that can be mitigated to an acceptable level. The measures outlined in the EMP attached will serve as a method to keep the proposed project from having any serious long term cumulative impacts on the receiving environment.

6. Motivation for the overall preferred site, activities and technology alternative

Geophysical surveys, and drilling are the only major methods used in exploring for deposits of this type and also for resource definition and evaluation. The technology to be used cannot be replaced by any other methods thus these are the preferred activities.

There is no site or layout alternative as the property provides the ideal geological formation for the presence of the minerals applied for. The positioning of the boreholes is determined by the expected location of the mineral reserve.

There are no technology alternatives considered and the proposed site was identified as the preferred alternative due to the following reasons:

- The KwaZulu-Natal province is rich and diverse in minerals and if exploited, has the potential to create major employment opportunities in the area.
- There are a few mining companies within the province mining different minerals ranging from gold, aluminium, cobalt, iron ore, nickel ore and manganese ore and aggregate to name a few.
- This information indicates that there are high chances of finding the sought-after mineral;
- The area comprises of mostly natural and cultivated land. From the site inspection there are numerous gaps between the settlements thus boreholes could be planned in those areas as to not affect infrastructure.
- The prospecting area can be reached by an existing access road from the gravel;
- No residual waste as a result of the prospecting activity will be produced that needs to be treated on site. The general waste produced on-site will be contained in sealed refuse bins to be transported to the local municipal landfill site;
- As maintenance and servicing of the equipment will be done at an off-site workshop the amount of hazardous waste to be produced at the site will be minimal and will mainly be as a result of accidental oil or diesel spillages; and
- Contaminated soil will be removed to the depth of the spillage and contained in sealed bins until removed from site by a hazardous waste handling contractor to be disposed of at a registered hazardous waste handling site and more information will be discussed after the granting of the prospecting right.

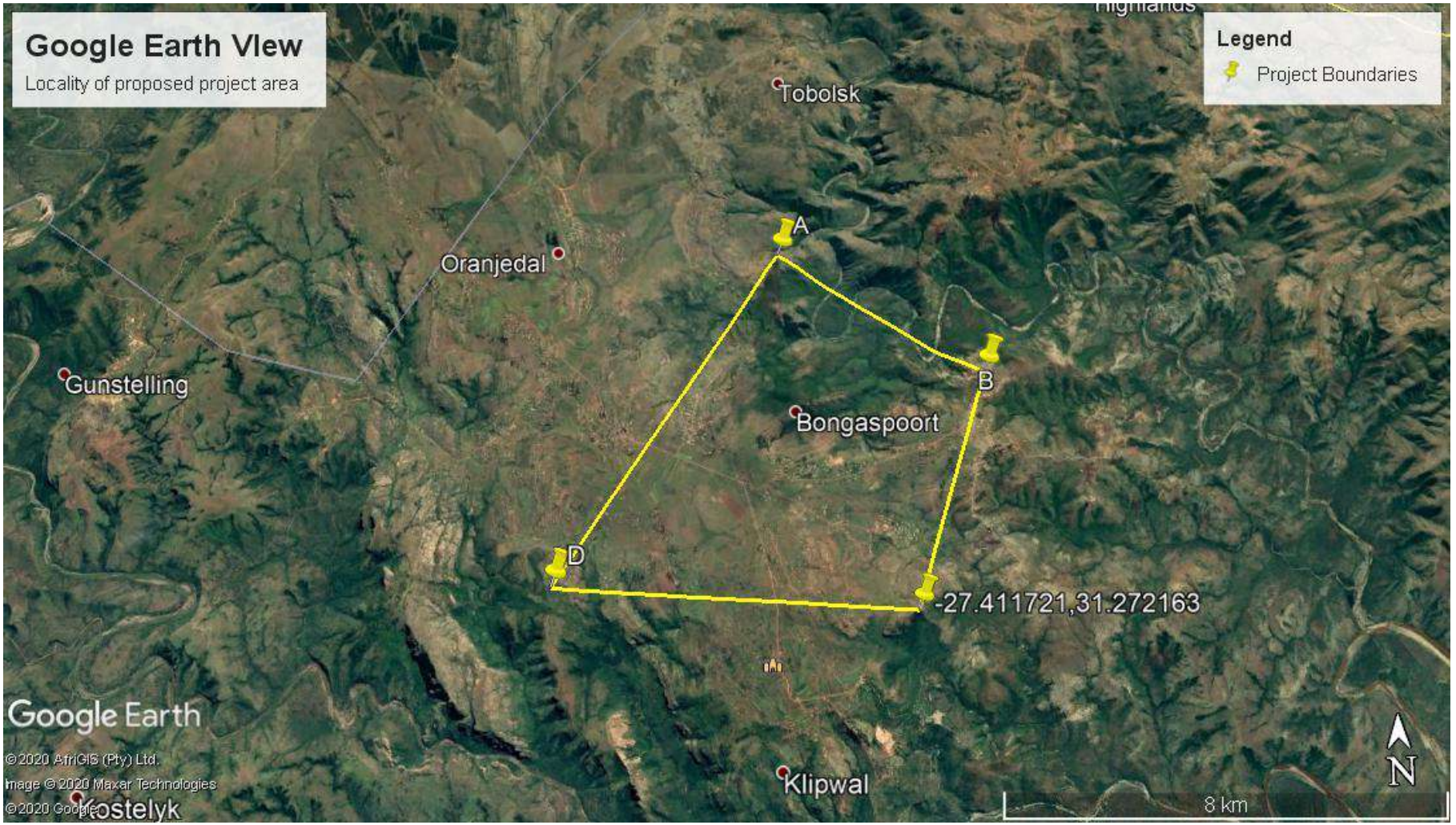


Figure 10: Satellite image of proposed project area

7. 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)

Each of the phases are dependent on the results of the preceding phase. The location, portion of portion 1 of the farm Simdlangentsha 16956 HU and the whole extent of the farm Bongaspoort 16930 HU, is the only site that is considered thus there are no alternatives and the extent of sampling, and possible core drilling cannot be determined at this stage.

The stakeholder consultation phase is still in motion; therefore we only have a few comments and issues raised from I&AP incorporated within this report.

8. Details of the development footprint alternatives considered

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

i. the property on which or location where it is proposed to undertake the activity;
ii. the type of activity to be undertaken;
iii. the design or layout of the activity;
iv. the technology to be used in the activity;
v. the operational aspects of the activity; and
vi. the option of not implementing the activity)

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

The prospecting right application directly affects portion of portion 1 of Simdlangentsha 16956 HU and the whole extent of the farm Bongaspoort 16930 HU. The development footprint encircles 3 410.61 ha.

b. The type of activity to be undertaken

No bulk sampling work will be carried out during this prospecting program. Invasive prospecting activities such as drilling as well as non-invasive activities will be conducted during prospecting due to the unavailability of extensive historical borehole datasets.

c. The design or layout of the activity

The location of activities will be determined based on the location of the prospecting activities, which will only be determined during Phase 1 of the Prospecting Works Programme. All infrastructure will be temporary and/or mobile and negotiations and agreements will be made with landowners to use existing infrastructure such as access roads.

- Portable ablution facilities will be used.
- Activities will be limited to the drilling of 15 boreholes to be determined by the geological formations found during prospecting
- It is planned to use one rig for all drill holes.
- Rehabilitation will be tightly controlled, and supervision will be focussed.
- No changes to the layout are considered but with the geophysical survey information, the holes can be orientated to match the shape of the good quality of resource.
- Buffer zones will apply to all the sensitive areas on site

d. The technology to be used in the activity

Geophysical surveys and drilling are the only major methods used in exploring for deposits of this type and also for resource definition and evaluation. The technology to be used cannot be replaced by any other methods thus these are the preferred activities.

Geophysical surveys also provide an added advantage of being done quickly and so execution can commence early. The safety factor of utilising geophysical surveys is also apparent, as there is less time to keep people exposed to moving machinery.

e. The operational aspects of the activity

A prospecting period of five years has been applied for. No permanent services including water supply, electricity, or sewerage facilities are required. All infrastructure to be developed will be mobile and temporary including portable toilets and water tanks.

The applicant shall ensure that this Environmental Management Programme is provided to the Project Manager and any other person or organisation who may work on the site.

f. The option of not implementing the activity.

The option of not approving the activities will result in a significant loss to valuable information regarding the mineral status (in terms of cobalt, iron ore, nickel ore and manganese ore) present on these properties.

Should economically feasible reserves exist on the study area and the applicant cannot prospect, the opportunity to utilise the reserves for future coal mining will be lost, i.e. the

minerals will be sterilised and resultant socio-economic benefits will be lost. The proposed prospecting activities have the potential to have a negative impact on the ecological environment as well as the social environment of the area. These impacts, however, can potentially be prevented, minimised, mitigated and managed to low and very low levels, as shown through the impact assessment.

9. Details of the Public Participation Process Followed

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

9.1 Regulatory Framework

The Public Participation is the basis of any EIA process. The Public Participation Process (PPP) seeks to provide the opportunity for all stakeholders including potential players and all applicable I&APs, state departments, state bodies and the competent authority (CA) to register so that they can raise concerns, contribute to local knowledge, comment on the Draft Basic Assessment Report (DBAR) & Environmental Management Programme report (EMPr) but most importantly provide suggestions for enhanced benefits. Comments received during the Public Participation Process are incorporated into the Final BAR & EMPr to be submitted to the competent authority being the Department of Mineral Resources & Energy for adjudication.

This section of the report provides an overview of the tasks undertaken for the public participation process to date. The public participation process was undertaken in accordance with the requirements of the EIA Regulations, 2014 (as amended, 07 April 2017) particularly Chapter 6 of this Regulation. It provides a guideline on how public participation processes must be conducted; it further stipulates timeframes in which these processes must be conducted in accordance with.

9.2 Defining Stakeholders

The term public can be taken to mean any individual or group in society, including the government and business sector. Who or what is included in the "public" depends very much on activities under consideration. The term "stakeholder" helps clarify the meaning or "public" in the context of development activities.

A stakeholder is any person, group of institution that has an interest in an activity, project or program. This includes both intended beneficiaries and intermediaries, those positively

affected, and those involved and/or those who are generally excluded from the decision-making process.

Stakeholders can usefully be categorized in five main types:

- Directly affected people (who live or work where the project will be located)
- indirectly affected people (who live nearby or use resources from the project area)
- public sector agencies (ministries, provincial or local government, government mandated mass organizations)
- private developers (private companies with a direct investment in the project) and their subcontractors and financiers
- others (donors, NGOs with a stake in the project, external advisors, the business sector).

9.3 Objectives of the Public Participation

Main objectives for involving the public are:

- the identification of key issues of concern to the public, addressing public perceptions,
- the provision of local expertise and knowledge,
- the identification of possible alternatives/options,
- ensuring that affected groups are involved at the very beginning of project design, and
- the critical review of documentation.

The separation of these objectives is somewhat artificial as the achievement of one will often depend upon the achievement of another.

9.4 Identification of Interested and Affected Parties

Settlements were searched using satellite imagery. There are farmland communities/settlements scattered on the said properties. All the affected properties belong to the king and no portions are state owned land. Other I&APs identified, include Organs of State, who have jurisdiction over, or might have an interest in the proposed protecting activities, adjacent and other landowners, non-governmental organisations and other organisations and / private persons. A list of the stakeholders (interested and affected parties) identified is included in **Error! Reference source not found.**.

9.5 Methodology of Notification

The following should be noted as it relates to the stakeholder consultation process.

9.5.1 Newspaper Advertisements

Newspaper advertising is used to target particular demographics that are traditionally much harder to reach through other media such as the internet and other social networks. A newspaper advertisement was published on the 08th of July 2022 in the Zululand Observer to notify all the Interested & Affected Parties of the proposed development. See Figure 11 for the published newspaper advertisement.

12 ZO PEOPLE 8 JULY 2022

Keep it local to boost tourism

Conelia Harry

WITH fuel price hikes, job losses, Covid-19 and flooding placing a strain on the economy, KZN residents are fortunate enough to have a vast range of interesting places, beautiful sights and magnificent reserves to explore on their doorstep.

This is the sentiment of local travel enthusiast and tourism champion Teshni Naidoo.

This vibrant and outgoing travel agent has been in the tourism industry for over 25 years, having worked in KZN, Gauteng and abroad in the United Kingdom.

Teshni said the pandemic had a serious impact on tourism, resulting in a drastic decrease in inbound international visitors, and the industry is only now beginning to recover.

"Zululand is so rich in wildlife and culture, and day visits to our attractions are easy through self-drive trips to Enseleni and uMlalazi nature reserves, or safaris to Hluhluwe-iMfolozi Game Reserve and iSimangaliso Wetland Park, to name a few.

"We saw fuel prices increase again this week, but locals can still take advantage of what our country has to offer her people.

"We should take advantage of the local beauty, and increase income in our economy.

"In my business, we encourage locals to enjoy Mzansi first before looking at an overseas holiday, and support local. Our economy will recover much quicker.

"With the support of our fellow South Africans, our small businesses can survive," she said.

Holding an array of qualifications, from business management, travel and tourism, to events and conferencing, it is being a qualified nature guide, serving as an honorary officer, working on community projects and serving on the uMhlathuze Community Tourism Organisation that fuels her passion for the industry.

In 2019, she saw retrenchment as an opportunity to venture into full-time entrepreneurship.

"Travel is in my DNA. I enjoy being around animals and in the outdoors; this line of work suits me perfectly as I get the splendour of nature and abundant wildlife our country offers.

"We have a diverse country which gives us rich cultures, history and food, and our locals must maximise these experiences before looking to travel abroad."

Teshni Naidoo is always ready for her next adventure

Community project

With a keen interest in conservation and promoting environmental awareness, Teshni invested in spekboom for World Earth Day.

Spekboom (*Portulacaria afra*) is a known natural carbon sponge and is endemic to South Africa.

"I chose this project owing to global warming and the effect it has on the environment.

"Spekboom effectively absorbs carbon dioxide from the atmosphere, and this wonder plant is said to remove over four tonnes of carbon dioxide annually per hectare planted. This helps fight against global warming.

"It improves the quality of the air we breathe.

"This plant has many facets, including multiple medicinal benefits and functions. Our goal is for every household to have this plant in their garden," she said.

Obituary: Jennifer Ann Kirkland 18.11.1947 - 17.06.2022

Community stalwart praised for being a visionary and trailblazer

MULTI-talented sportswoman, singer, musician, public speaker, philanthropist and academic Jennifer Ann Kirkland (née Hill-Lewis) passed away on 17 June, barely six months after the loss of her beloved husband, Andy.

The community of Mtunzini, especially feels the loss of one who was a wonderful blessing to the lives of so many people.

Jenny's younger sister Nannette McKenzie wrote this tribute:

"We salute you Jenny, for a life lived to the full.

You gave so much of yourself to every life you touched and have left a huge void in all of us who remain and mourn and loved you so very much.

It is with deep sadness we bid our final farewell to another long-established resident.

We call to mind some of this multi-talented lady's contributions to our community.

Jenny, particularly in her earlier days, was nothing short of a trailblazer.

This innovative, multi-talented lady literally mobilised our village to build the pre-primary school.

At the time, a small group of children met with their teacher in the Town Hall or in private homes. What a joy it was to eventually have our own pre-school.

A visionary way beyond the times, Jenny, having completed the task of getting the school built, turned her energy and attention to the women in our neighbouring Obanjeni and mobilised them to gather the plethora of plastic bags that littered the countryside, and become creative.

This resulted in her hugely successful award-winning project that taught the women in Obanjeni how to make hats and mats out of plastic bags.

This not only empowered this rural community, but also helped to clean up our ever-struggling environment.

Tourists would come to the farm and after tea or lunch at Ngoye View, would be taken out to Obanjeni to see the project.

Through this initiative, Jenny was awarded the inaugural Nelson Mandela Award for Community Upliftment, and was also guest speaker at the International Rotary Conference held in Durban where she was awarded the Jean Harris Award for Community Upliftment.

Jenny was a qualified and extraordinarily gifted musician with a great voice.

She brought much joy to various gatherings and occasions over the years, infusing the occasion with her great love of fun.

And many a young person will testify to her being a maths teacher extraordinaire - and saving them from getting the big F in matric.

Jenny's talents were not limited to indoors as, for a number of years, she was a strong contender on the tennis court.

She would invite scores of village children and treat them to a memorable day filled with horse riding, tennis, skating and more.

Latterly, much of Jenny's time was spent caring for Andy as his health deteriorated, but she still enjoyed those moments with friends around the bridge table whenever she could make it.

I hear that here, too, she was accomplished.

Thank you, Jenny for the legacy you have left this village.

Rest in peace."

Jennifer Ann Kirkland

NOTICE OF PUBLIC PARTICIPATION FOR PROSPECTING RIGHT AND ENVIRONMENTAL AUTHORISATION APPLICATION

ISIZULU

Isaziso senqubo yokuLindela ilungelo Lesicelo sokuhlola umhlaba ngokoMthetho Wezokumbiwa phansi kanye Nezimbiwa noPhethiloli (i-MPRDA) (Umthetho 28 ka 2002) ngokihlola iCobalt, Iron Ore, Nickel Ore and Manganese Ore kwinxenye ye portion of portion 1 ye famu i-Simdlangentsha No. 16956 HUkanye ne xenya lonke le famu i- Bongaspoort 16930 HU, esendaweni yase Zululand District Municipality, eSifundazweni sase KwaZulu-Natali.

ISIMEMO SOKUPHAWULA NOKUVEZA IMIBONO MAYELANA NALE APPLICATIONI

Ngalesi sikhathi kunikezwa isaziso ngokoMthetho Wezokumbiwa phansi kanye Nezimbiwa noPhethiloli (i-MPRDA) (Umthetho 28 ka 2002) kanye nemigomo ye-EIA 2014, ekhishwe ngaphansi kwesaziso sikaHulumeni Nombolo 982 kuGazethi Nombolo 3822 yomhla ziyi-4 kuZibandlela wezi-2014 ukuthi kuchitshiyelwe ngomhlaka 7 kuMbasa 2017 ukuthi i-**Ulibo Resources (Pty) Ltd** ifake isicelo selungelo sokuhlola umhlaba ngokumbiwa phansi kwale minerali eshiwo ngenhla (**DMRE REF: KZN 30/5/1/1/2/11230 PR**).

Njengengxenye yenqubo ye-EIA, ikakhulukazi inqubo yokubamba iqhaza komphakathi kule phrojekthi ehlongozwayo. Amaqembu Athintekayo nanentshisekelo (IAPs) ayamenywa ukuba abhalise futhi alethe ngumusa noma yikuphi ukuphawula noma ukukhathazeka kufinyelele ku **Nokuthula Nkosi** kungakadluli umhlaka **14 KuAugusti 2022,** kusetshenziswa imininingwane yokuxhumana enikezwe ngezansi.

Umphakathi umenywe ukuthi ubukeze futhi uphawule ngombiko Draft Basic Assessment Report kanye ne-Environmental Management Programme Report. Le reporti uzotholakala ukuthi ubuyekezwe isikhathi sezinsuku ezingu-30 zekhalenda kusukela ku-**15 Julayi 2022 kuze kube u-14 Augusti 2022**. **Le reporti izotholakala ePongola Public Library (61 Martin St Pongola, 3170).**

Ukuthola eminye imininingwane noma ukubhalisa njengeNhlangano Enentshisekelo noma Ethintekayo, sicela uthinte: -

ENGLISH

Notice of the Prospecting Right Application Process as per the Minerals and Petroleum Resources Development Act (MPRDA) (Act 28 of 2002) for the prospecting of **Cobalt, Iron Ore, Nickel Ore and Manganese Ore** on **portion of portion 1 of Simdlangentsha No. 16956 HU** and the **whole extent** of the farm **Bongaspoort 16930 HU**, situated within the Local Municipality of uPhongolo, under Zululand District Municipality, KwaZulu- Natal Province.

INVITATION TO COMMENT

Notice is hereby given in terms of the *Mineral and Petroleum Resources Development Act* (MPRDA) (Act 28 of 2002) and EIA regulations 2014, published under Government Notice No. 982 in Gazette No. 3822 of 4 December 2014, amended on 7 April 2017 that Ulibo Resources (Pty) Ltd has applied for a Prospecting Right for the above-mentioned minerals with **DMRE REF: KZN 30/5/1/1/2/11230 PR.**

As part of the EIA process, more especially the public participation process for this proposed project, Interested and Affected Parties (I&APs) are invited to register and kindly submit any comments or concerns to reach **Ms Nokuthula Nkosi** by no later than the **14th of August 2022,** using the contact details provided below. The public is invited to review and comment on the Draft Basic Assessment Report and Environmental Management Programme Report. The draft report will be available for review for 30 calendar days from the **15th of July 2022** to the **14th of August 2022.** This report will be available at **Pongola Public Library (61 Martin St, Pongola, 3170).**

For more information, to register as an Interested or Affected Party, please contact: -

Singo Consulting (Pty) Ltd

Office No. 870, 5 Balalaika Street, Tasbet Park Ext 2, eMalahleni (Witbank), 1040

Contact Person: Nokuthula Nkosi
Tel No: 013 692 0041
Cell No: 081 386 8589
Fax: 086 514 4103
Email: nokuthula@singoconsulting.co.za

ULIBO RESOURCES (Pty) Ltd

No. 32 Anne Scheeper Street, Del Judor, Del Judor Ext, eMalahleni, Mpumalanga, 1035

Contact person: Musa Malikane
Tel: 013 696 2518
Cell: 071 126 1157
Fax: 086 525 7154
Email: malikanem@gmail.com

Figure 11: Newspaper Advert Published

9.5.2 Public Space Notices

Site notices presented in English and Zulu were placed around the farm boundaries, adjacent properties, the local municipality and uPhongolo Public Library on the 06th of July 2022 as another means of notifying any person/s who would be Interested & Affected by the proposed development. Refer to Photo 5 for Proof of site notice placement.

Photo 5: Site notice placement

9.5.3 WinDeed searches to identify farm portions and owners respectively

Table 9: WinDeed Search Results – Simdlangetsha 16956 HU

Printed: 2020/08/31 15:07

windeed
A LexisNexis® Product

Farm List

Date Requested	2020/08/31 15:06
Deeds Office	PIETERMARITZBURG
Registration Division	HU
Farm Name	SIMDLANGETSHA
Farm Number	16956
Remaining Extent	NOT SELECTED

PORTION LIST

Portion	Owner
0	INGONYAMA TRUST-TRUSTEES
1	INGONYAMA TRUST BOARD-TRUSTEES
2	INGONYAMA TRUST BOARD-TRUSTEES
3	INGONYAMA TRUST BOARD-TRUSTEES
4	INGONYAMA TRUST BOARD-TRUSTEES
5	UPHONGOLO MUNICIPALITY
6	*** NO LONGER EXISTS - SEE ENDORSEMENTS ***
7	*** NO LONGER EXISTS - SEE ENDORSEMENTS ***
8	*** NO LONGER EXISTS - SEE ENDORSEMENTS ***

DISCLAIMER

This report contains information gathered from our suppliers and we do not make any representations about the accuracy of the data displayed nor do we accept responsibility for inaccurate data. WinDeed will not be liable for any damage caused by reliance on this report. This report is subject to the terms and conditions of the WinDeed End User Licence Agreement (EULA).

Table 10: WinDeed Search Results – Bongaspoort 16930 HU

Printed: 2020/08/31 15:26

windeed
A LexisNexis® Product

Farm List

Date Requested	2020/08/31 15:08
Deeds Office	PIETERMARITZBURG
Registration Division	HU
Farm Name	BONGAS POORT
Farm Number	16930
Remaining Extent	NOT SELECTED

PORTION LIST

Portion	Owner	Title Deed	Registration Date	Purchase Price (R)
1	SOUTH AFRICAN BANTU TRUST-TRUSTEES	T26287/1968PN	1968/08/06	R0.00
2	*** NO LONGER EXISTS - SEE ENDORSEMENTS ***			

DISCLAIMER

This report contains information gathered from our suppliers and we do not make any representations about the accuracy of the data displayed nor do we accept responsibility for inaccurate data. WinDeed will not be liable for any damage caused by reliance on this report. This report is subject to the terms and conditions of the WinDeed End User Licence Agreement (EULA).

9.5.4 Distribution of Draft Basic Assessment Report (BAR) and Environmental Management Programme report (EMPr)

The Draft BAR and EMPR will be released for a period of 30 days from 15th of July 2022 to 14th of August 2022.

Hard copies of the Draft BAR and EMPr will be submitted to organs of state and relevant authorities that have requested it i.e. KwaZulu-Natal Amafa and Research Institute, Department of Agriculture, Land Reform and Rural Development (DALRRD), South African National Roads Agency Ltd (SANRAL) & Department of Water and Sanitation (DWS). Additionally, copies were placed at the uPhongolo Public Library. Electronic copies will be made available upon request from Singo Consulting (Pty) Ltd via email; Dropbox link; Google drive; WeTransfer, etc.

9.6 Traditional Authorities

Traditional Authorities will be consulted.

9.7 Relevant Government Departments

The following departments and organization formed part of the consultation process;

- Department of Agriculture, Forestry and Fisheries
- Department of Rural Development and Land Reform
- Department of Economic Development, Tourism and Environmental Affairs
- Department of Water and Sanitation
- Department of Environmental Affairs and Land Rights
- Transnet
- Department of Transport (KZN)
- Eskom
- Sanral
- uPhongolo Local Municipality
- Zululand District Municipality
- SAHRA
- Bird Life South Africa
- The QFM Projects (Pty) Ltd
- SANBI
- AMAFA
- Ezemvelo KZN Wildlife

10 Summary of issues raised by I&APs

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

Table 11: Issues raised by Stakeholders

Interested and Affected Parties List the name of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted		Date Comments Received(Call, Fax, emails)	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
AFFECTED PARTIES					
Landowner/s	X				
Ingonyama Trust Board-Trustees (Mavuso Tribe)					
South African Bantu Trust-Trustees (Sibiya Trust)					

Lawful occupier/s of the land					
N/A					
Landowner or lawful occupier on adjacent properties					
N/A					
Municipal councillors					
Local Municipality: uPhongolo					
District Municipality: Zululand					

Organs of state (Responsible for infrastructure that may be affected: Roads, Departments, Eskom, Telkom& DWA)					
	X				
	X				

transport Department: Transport PROVINCE OF KWAZULU-NATAL					
Eskom					
TRANSNET					
Communities					
Bongaspoort & Simdlangentasha					
Dept. Land affairs					

rural development & land reform Department: Rural Development and Land Reform REPUBLIC OF SOUTH AFRICA					
COMMISSION ON RESTITUTION OF LAND RIGHTS					
Tribal leaders	X				
N/A					
Dept. of Economic Development, Tourism and Environmental affairs					
edtea Department: Economic Development, Tourism and Environmental Affairs PROVINCE OF KWAZULU-NATAL					
Other competent authority					

South Africa KWAZULU-NATAL Zulu Kingdom. Exceptional					
public works Department: Public Works PROVINCE OF KWAZULU-NATAL					
AMAFA/HERITAGE KWAZULU NATAL					
labour Department: Labour REPUBLIC OF SOUTH AFRICA					

SANBI South African National Biodiversity Institute Biodiversity for Life					
South African NATIONAL PARKS					
BirdLife SOUTH AFRICA Giving Conservation Wings					

EZEMVELO KZN WILDLIFE Conservation, Partnerships & Ecotourism			•		
SAHRA					
Other Affected Parties					
The QFM Projects (Pty) Ltd					
Interested parties					

11 The Environmental attributes associated with the alternatives

(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical, and biological aspects)

As discussed in the previous section, Ulibo Resources (Pty) Ltd applied for prospecting rights over the area of interest. Based on the outcomes of that study, the possibility to encounter further cobalt, iron ore, nickel ore and manganese ore reserves on the properties subject to this Prospecting Right Application was identified.

The company therefore applied for prospecting on the properties as discussed in this report to determine the presence of cobalt, iron ore, nickel ore and manganese, and whether these are feasible to enter into further studies towards a Mining Right. No alternatives are available that will have an impact on a different setting than the environment discussion provided for below.

11.1 Baseline Environment

Type of environment affected by the proposed activity

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

11.1.1 Topography

Topography is the study of the shape and features of land surfaces. The topography of an area could refer to the surface shapes and features themselves, or a description (especially their depiction in maps).Topography is a field of geoscience and planetary science and is concerned with local detail in general, including not only relief but also natural and artificial features, and even local history and culture. This meaning is less common in the United States, where topographic maps with elevation contours have made "topography" synonymous with relief.

Topography in a narrow sense involves the recording of relief or terrain, the three-dimensional quality of the surface, and the identification of specific landforms. This is also known as geomorphometry. In modern usage, this involves generation of elevation data in digital form (DEM). It is often considered to include the graphic representation of the landform on a map by a variety of techniques, including contour lines, hypsometric tints, and relief shading.

Topography is an important factor in site analysis. If a site is flat, topography will not affect the location and layout of the building. But on a sloping site topography is a significant factor. The slope of a site or slope of an adjacent site will affect the access of sun & views. Topography refers to the slope and level of the land, whether the land is flat and plain, or in sloping. Topography is a measurement of elevation and slope is the percentage change in that elevation over a certain distance. Topography is measured by to connecting points of same elevation. These points are known as the topographic contours. Slope is measured by the distance between one point to another point and this distance is divided by the lateral distance between them.

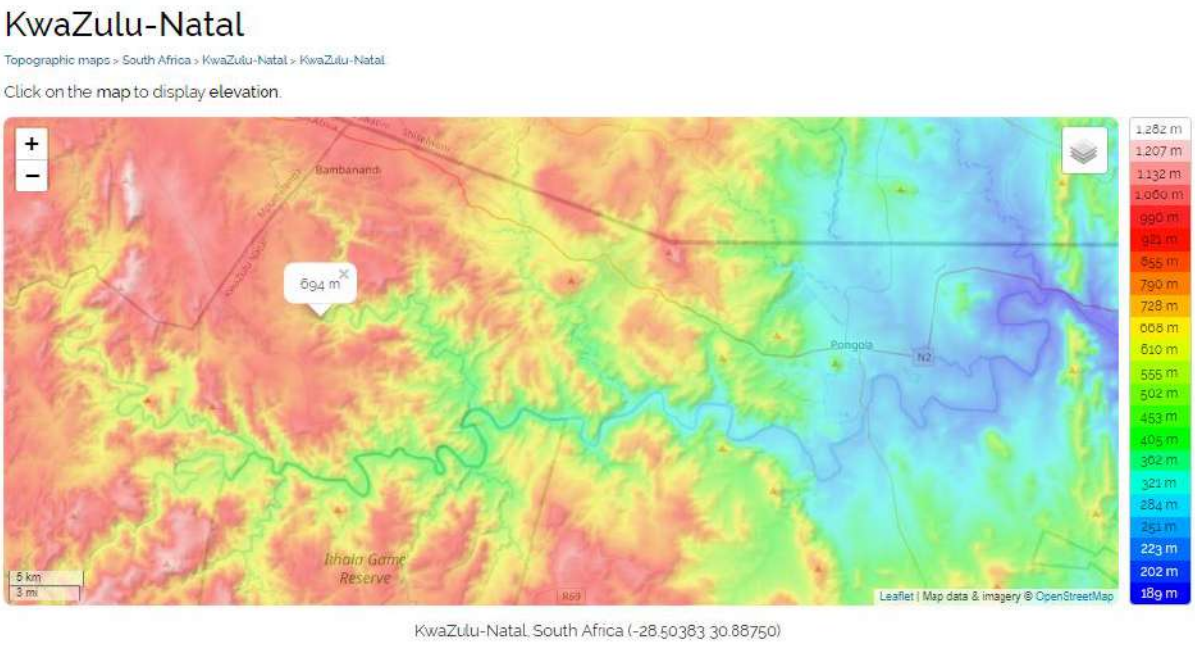


Figure 12: Topography of Kwa-Zulu Natal Province

The proposed project site falls within the KwaZulu Natal region which has generally steep topography, typical of the region. The proposed project area falls on the mountainous planes. **Figure 13** below illustrates the topology of the proposed project area. The upper half of the project area consists of mostly mountainous ground while the bottom half has contour lines that are more spread out illustrating a less mountainous plane than the upper half. The project area has an average above sea level ranging from 600 masl to 980 masl

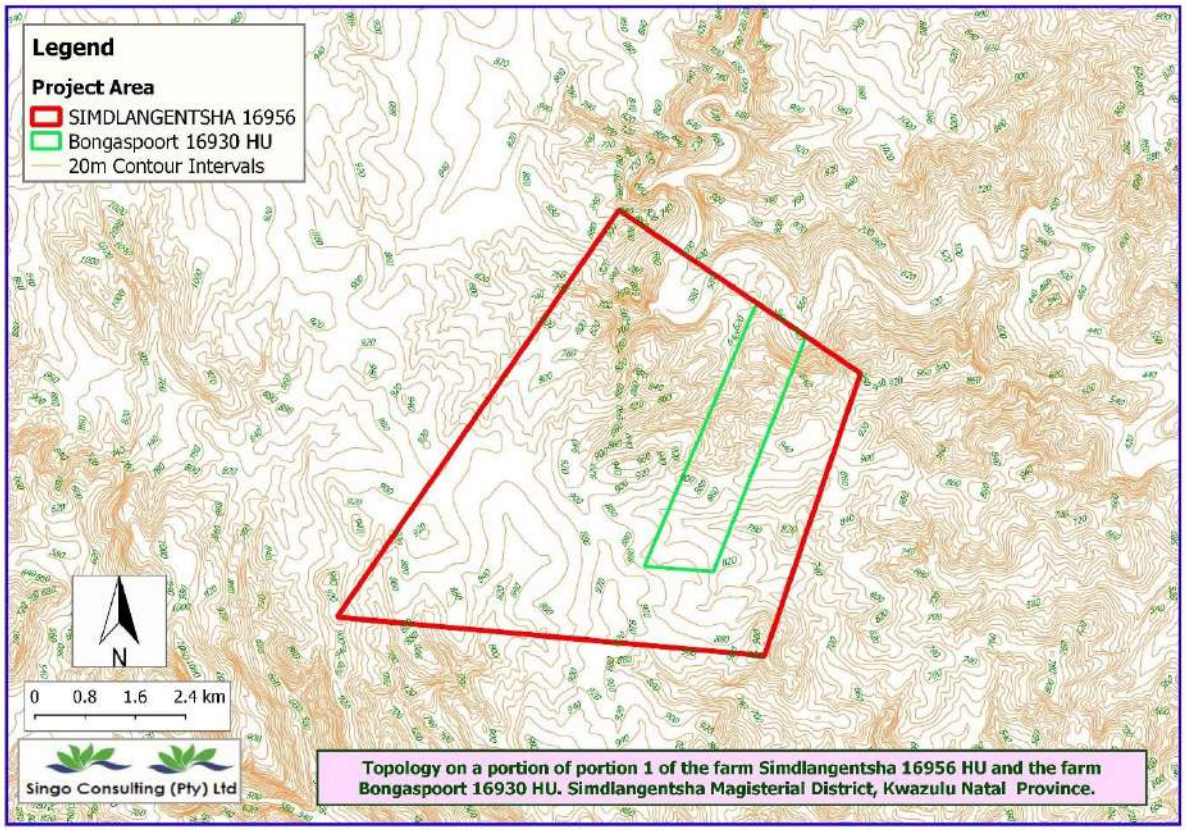


Figure 13: Topographical map

11.1.2 Climate

Climate (from Ancient Greek klima, meaning inclination) is commonly defined as the weather averaged over a long period. The standard averaging period is 30 years, but other periods may be used depending on the purpose. Climate also includes statistics other than the average, such as the magnitudes of day-to-day or year-to-year variations. The Intergovernmental Panel on Climate Change (IPCC) 2001 glossary definition is as follows: Climate in a narrow sense is usually defined as the "average weather," or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period ranging from months to thousands or millions of years. The classical period is 30 years, as defined by the World Meteorological Organization (WMO). These quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

The difference between climate and weather is usefully summarized by the popular phrase "Climate is what you expect, weather is what you get." Over time spans there are a number of nearly constant variables that determine climate, including latitude, altitude, proportion of land to water, and proximity to oceans and mountains.

Climate data was obtained from World Weather Online which records the temperature, rainfall, wind speed and humidity for the varying seasons.

Rainfall and Temperature

Pongola normally receives about 801mm to 1000mm of rain per year, with most rainfall occurring during mid-summer. It receives the lowest rainfall in winter and the highest in December.

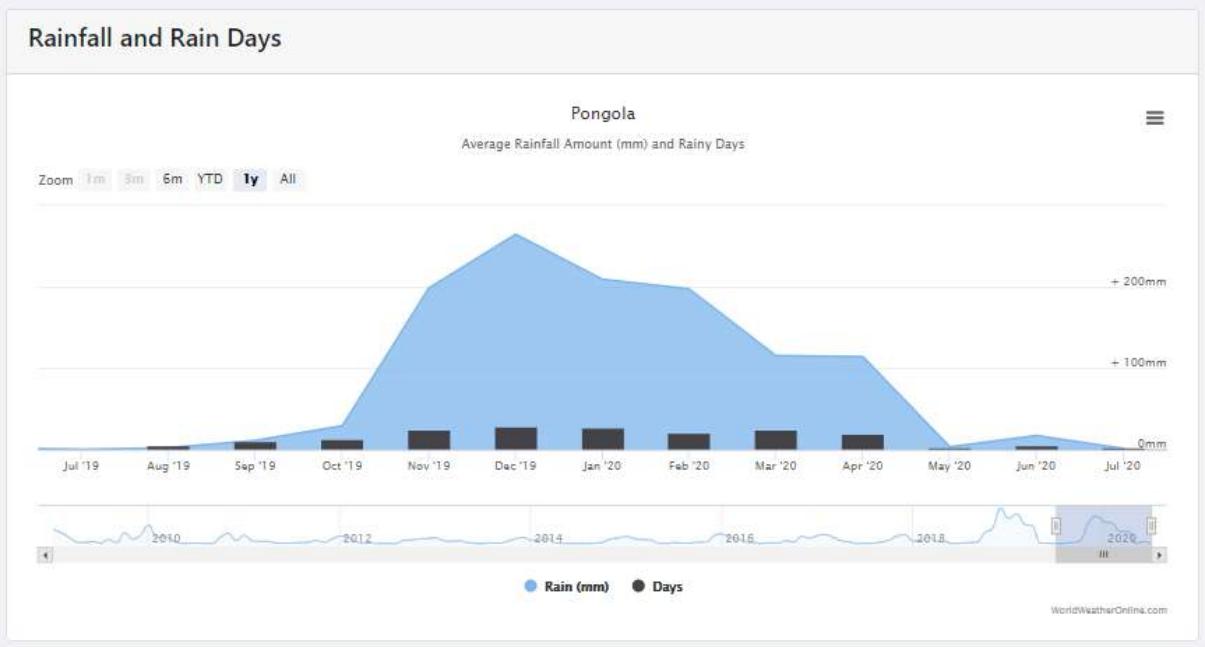


Figure 14: Rainfall in Pongola (Source: WorldWeatherOnline.com)

Figure 15 below illustrate the annual rainfall experienced within the proposed project area.

Figure 15: Average Annual Rainfall

The average midday temperatures for Pongola ranges from 15.0°C in June to 24.0°C in January. The region is the coldest during June when temperatures drop to 4 °C on average during the night.

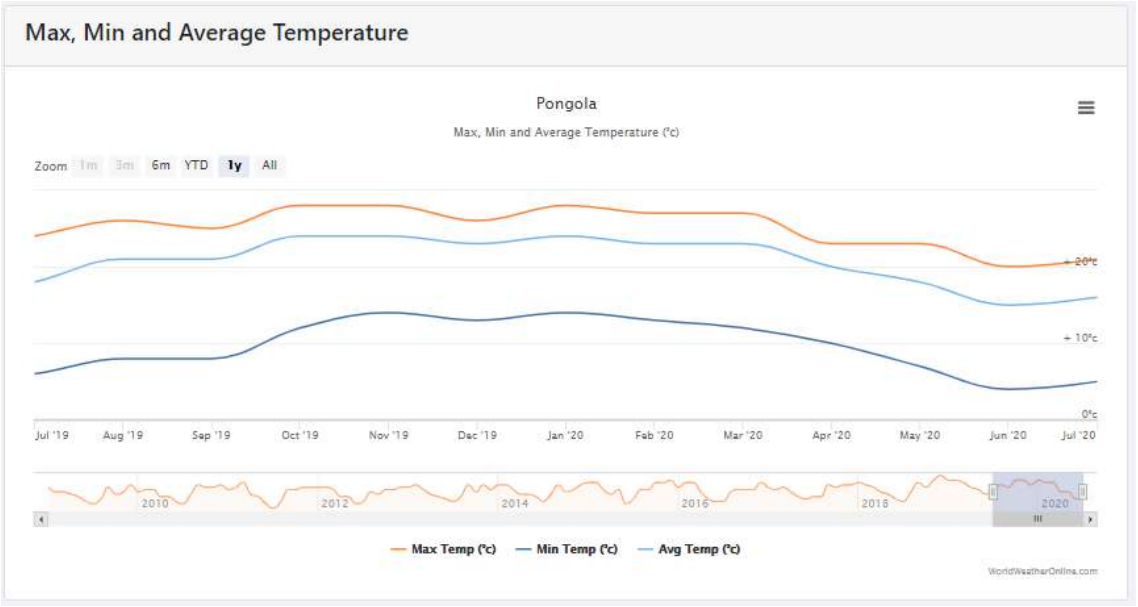


Figure 16: Max, Min and Average Temperature

11.1.3 Air Quality

The assessment of the ambient air quality is based on available ambient air quality information identified in the literature review and data supplies by the Department of Environmental Affairs (DEA) and the South African Weather Service (SAWS).

Regional Ambient Air Quality

KwaZulu Natal experiences a wide range of both natural and anthropogenic sources of air pollution ranging from veld fires to industrial processes, agriculture, mining activities, power generation, paper and pulp processing, vehicle use and domestic use of fossil fuels. Different pollutants are associated with each of the above activities, ranging from volatile organic compounds and heavy metals to dusts and odours.

According to an EIA report that was drafted for a project in Kwa-Zulu Natal, domestic burning is a common source of pollution in the province. Typical diurnal patterns driven by domestic cooking and heating are visible in the diurnal distribution. Isolated high peaks in CO and SO2 suggest an impact for industry and biomass burning in the area. CO values are relatively low and below the national guidelines.

Particulate matter PM (PM10 and PM2.5), NOx and SO2 are especially high during times of domestic burning. It is evident that the ambient concentrations of pollutants in low income areas are poor. Even isolated villages are expected to have high PM values. Any contribution to ambient PM and NOx would therefore be significant.

As the townships are developed, the settlements move to more modern means of cooking, heating and lighting. During the site visit we observed multiple Eskom power lines that run through the area of interest. An Environmental Outlook Report was release in 2018 to facilitate the areas in KwaZulu Natal that are hotspots.

According to AccuWeather.com and iqair.com, the current air quality in Pongola is good to excellent with minimal pollutants (see Figure 17).

Figure 17: Pongola Air Quality (Source: www.accuweather.com and www.iqair.com)

11.2 Geology

According to Wikipedia, geology is defined as an earth science that focuses on the solid Earth, the rocks of which it is composed, and the processes by which they change over time.

11.2.1 Regional Geology

The White Umfolozi Inlier is the largest of the southern erosional inliers (Figure 2.1 and 2.2). It crops out in the Denny Dalton area in northern KwaZulu-Natal as a northwest-southeast trending inlier, surrounded by sedimentary rocks of the Karoo Supergroup. The White Umfolozi River has incised a large valley into the pre-Karoo rocks, exposing the Pongola Supergroup and basement granites and gneisses.

The Nsuze Group in the White Umfolozi Inlier crops out as a ~1 800 m thick succession (Matthews, 1967) of interlayered volcano-sedimentary units the lowermost of which rests nonconformably on basement granites and gneisses (Figure 2.5). It consists of a basal sedimentary unit of feldspathic sandstone, two volcanic sequences of basalts, andesites and dacites, with a thick sedimentary sequence of arenaceous, argillaceous and rudaceous rocks which split the volcanics. Minor lenses of volcaniclastic material are often evident immediately above and/or below the volcanics.The Thembeni Formation which conformably overlies the Nhlebela Formation lavas comprises mainly volcaniclastic, grey to green siltstones and shales. The Chobeni Formation is dominated by a fairly uniform sequence of quartz sandstones with numerous lenses of carbonate-rich, dolomitic sandstones, dolomite and greywacke. The evidence of stromatolites within the dolomites is of importance as there is no other recorded occurrence of stromatolites in the Nsuze Group (Mason & Von Brunn, 1977).

The Bivane Formation which conformably overlies the Chobeni Formation is a thick succession of amygdaloidal lavas of basaltic, andesitic and dacitic composition. Pyroclastic rocks, pahoehoe, and ropy lava structures near the base of the formation indicate a predominantly sub-aerial extrusive environment.

In the White Umfolozi Inlier the Mozaan and Nsuze Groups are separated by an angular unconformity marked by a ~10° difference in dip. The sedimentary rocks of the Mozaan Group dip east-northeast at an average dip of 10° whereas the underlying Nsuze Group dips at 20° to the northeast (Matthews, 1967). The Mozaan Group in this area is known for its conglomeratic units which are similar to conglomeratic units of the Witwatersrand Supergroup and are also auriferous in nature (Hatch, 1910., Matthews 1967., Weilers 1990.).

The Mandeva Formation is composed of coarse-grained quartz arenite with subordinate conglomerate and banded iron formation. Sub-rounded to rounded quartz and chert pebbles predominate in the conglomerates which fine upwards to quartz arenite. The lower conglomerate is auriferous in nature and the "reef" which was mined at Denny Dalton (Figure 2.2) is ~1 m in thickness. Matthews (1967) indicated that the lower part of the Mandeva Formation wedges out and represents the first member in a transgressive sequence. Due to

the chemical maturity of the quartz arenites within the Mandeva Formation the depositional environment could have been a near-littoral, open-sea environment (Matthews, 1967). The lower sandstones and conglomerates of the Mandeva Formation are overlain with a sharp contact by an 8 - 12 m thick green to black shale with interlayered banded iron formation. The sharp contact between the shale and underlying coarse sandstones indicates a marine transgression from lower shoreface to deep-marine.

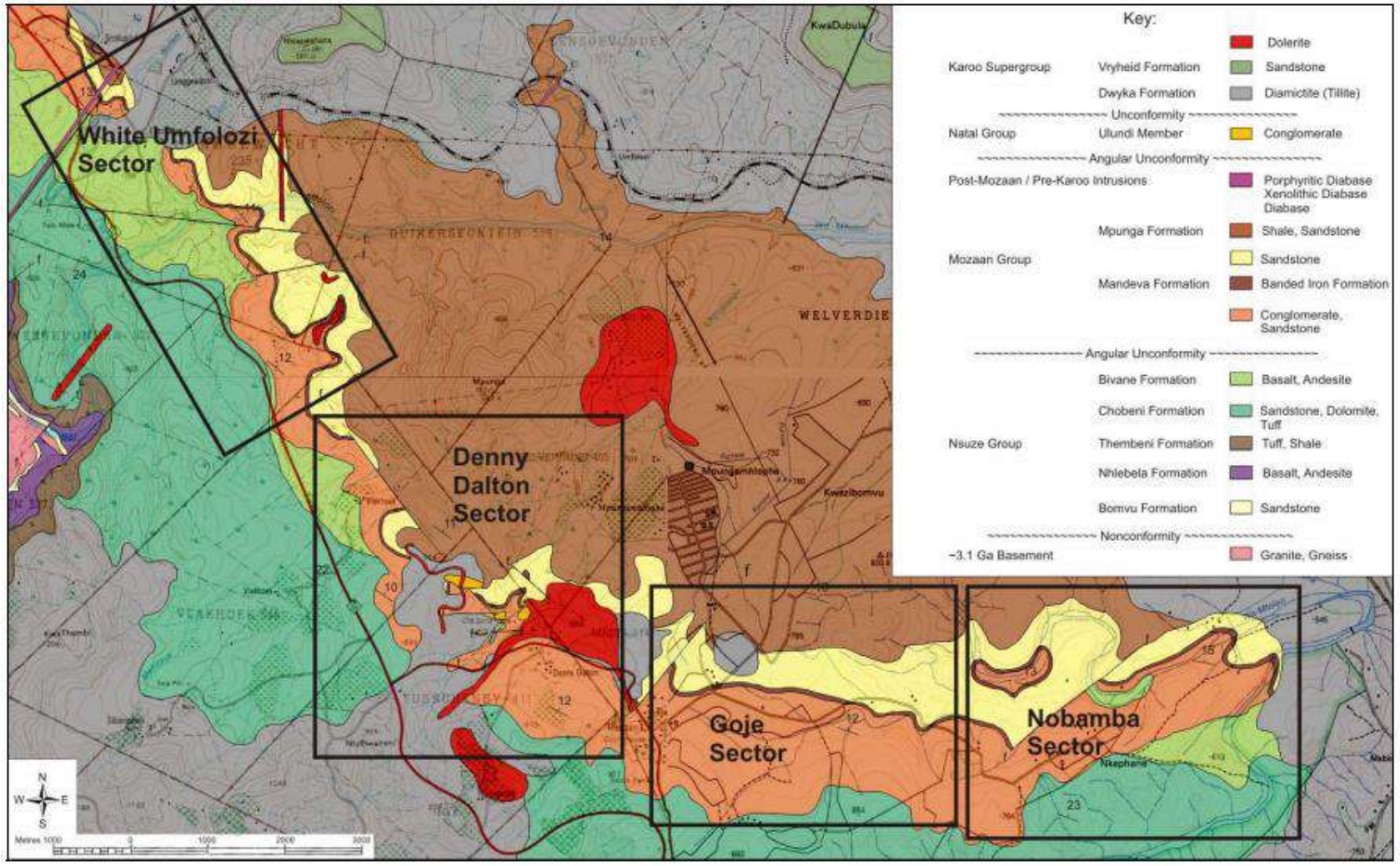


Figure 18: Geological map of the study areas in the White Umfolozi Inlier.

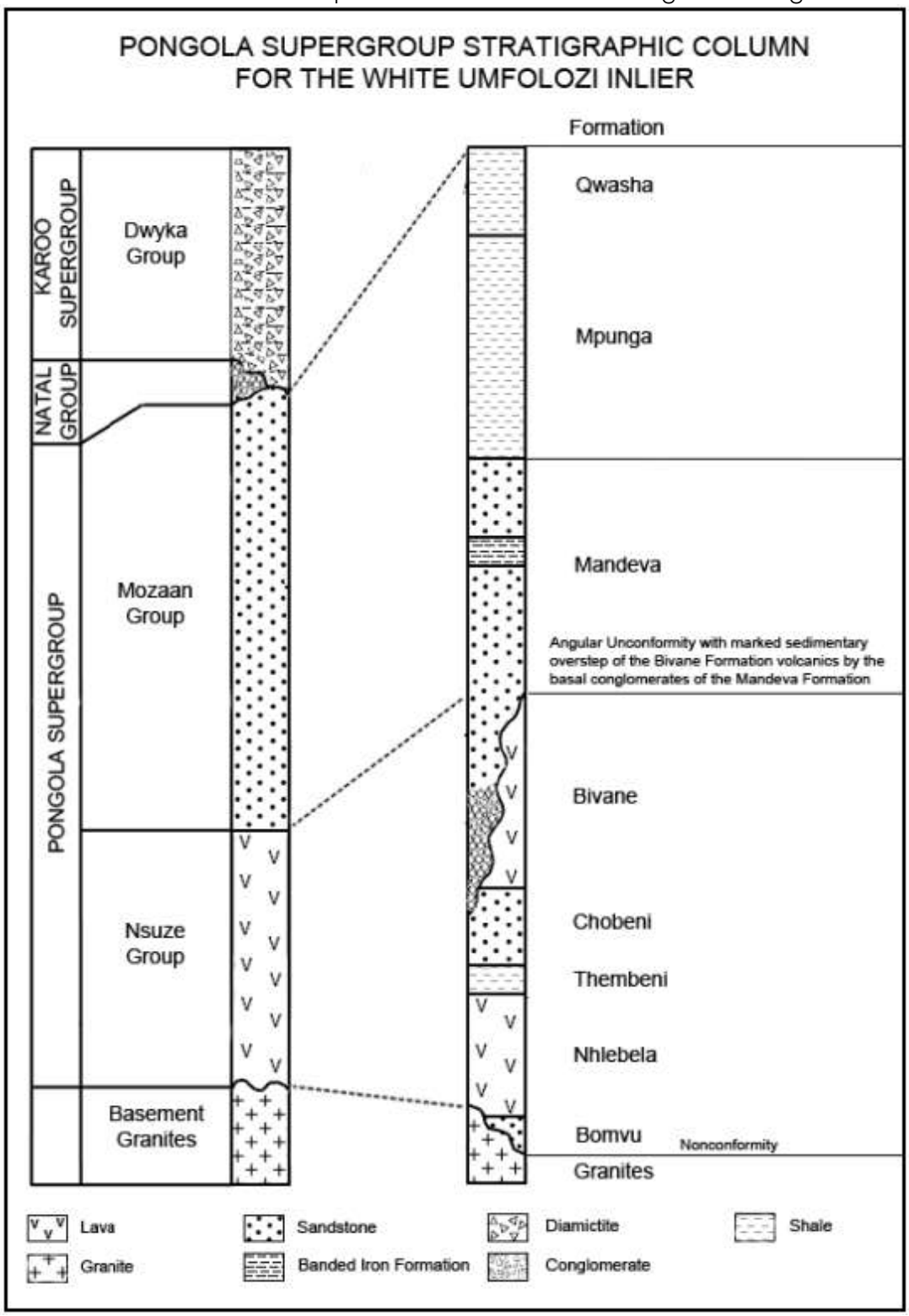


Figure 19: Stratigraphic column for the White Umfolozi Inlier compiled by the author, showing the Groups and Formations

11.2.2 Local Geology

The Klipkloof quartz arenite is overlain with a sharp and locally sheared contact by shales and siltstones of the Vlakhoek Member. This sharp contact is identified within the White Umfolozi, Denny Dalton and Goje sectors. In the Nobamba sector however, alternating beds of shale and coarse siltstone form a fining-up sequence from the underlying gritty quartz arenites. The lowermost 5 m of the member comprises dark grey to black laminated mudrock with interlayered fine siltstone at its base. The siltstone interlayers attain a maximum thickness of 5 cm with a mean of 2 cm and are only present within the lower 2 m of the unit. Ferruginous mudstone interlayers are evident in the upper 2 m of the unit and exhibit a characteristic faint red colouration.

Pyrite is the most abundant ore mineral in all the sections and commonly makes up 70 to 80% of the ore minerals present in the conglomerates. Pyrite occurs as sand to pebble-sized grains, as well as anhedral to euhedral crystals within the matrix. Three generations of pyrite can be identified.

Figure 20: Sharp, locally sheared contact between Klipkloof quartz arenite and Vlakhoek Member shales, Nxobongo stream, Denny Dalton sector. Photo facing northeast

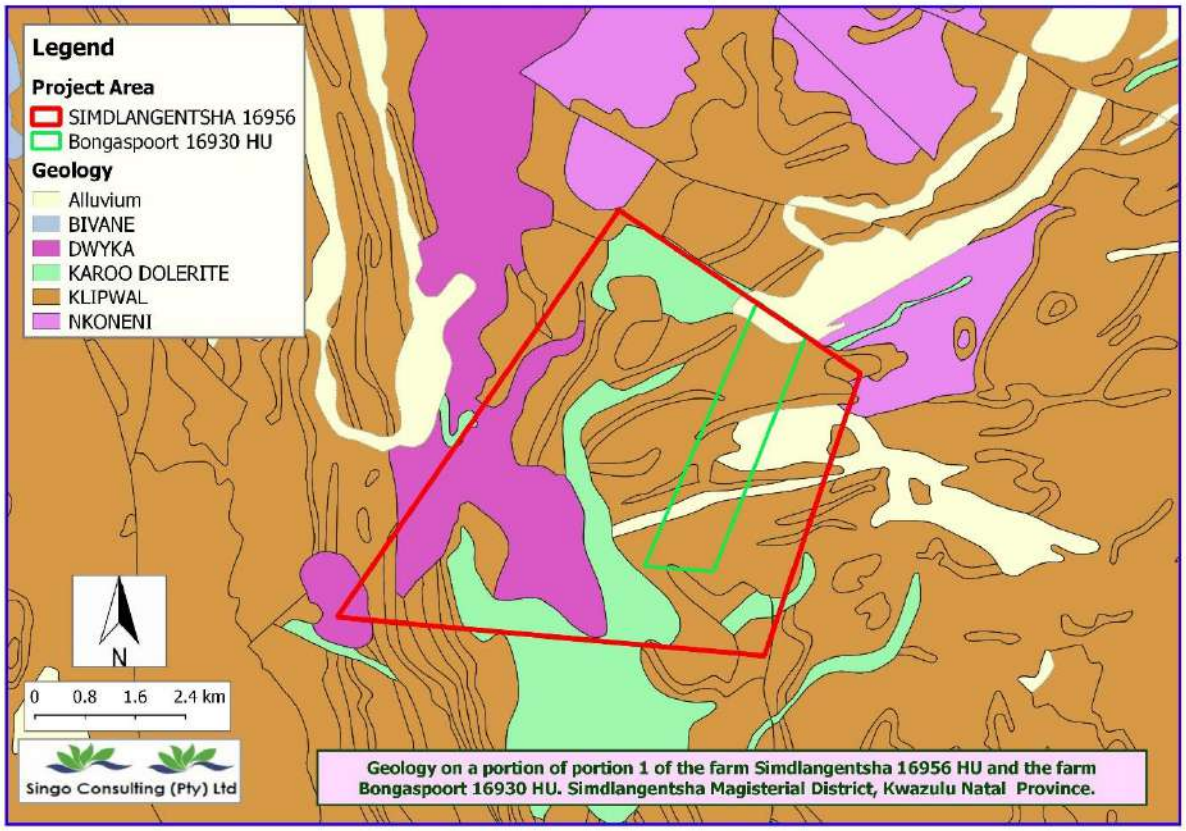


Figure 21: Geological map of the proposed project area

The proposed project area consists mainly of the klipwal, karoo dolerite and dwyka geology. Multiple sedimentary sequences, up to and over 300 m thick, and comprising the Late Palaeozoic Dwyka Group in the southeastern part of the African subcontinent, were deposited during deglaciation of the Gondwana ice sheet. Attention is focused on the northern part of KwaZulu/Natal in South Africa where the Dwyka Group, represented by glaciogenic deposits, rests on an uneven surface of Archaean basement rocks. These deposits occur on the northwestern flank of an elongate pre-Dwyka crustal downwarp which had a significant influence on the mode of sedimentation as it progressively subsided.

Rapid dissipation of the ice in the closing stages of deglaciation was followed by accumulation of postglacial muds which mantled the glaciogenic sediments. In the northernmost part of the study area proximal products of deglaciation, represented by conglomeratic deposits and associated sandstones, are preserved in deep partly exhumed glaciated valleys and depressions along the southern periphery of the Archaean upland. The distinctive character of the Dwyka Group in northern KwaZulu/Natal is partly attributable to the complex tectonic setting in which it occurs and reflects an interplay of various factors that controlled the styles of sedimentation during deglaciation

The lower mudstone unit is overlain by 3 m of well banded, Superior-type banded iron formation. Macrobands of iron oxides are interlayered with bands of jaspilite, the former being predominantly magnetite. Macrobands are separated by sharp contacts, with bands ranging in thickness from 1 to 5 cm in thickness. Microbands 1 to 3 mm thick are often present within jaspilitic macrobands. The banded iron formation is overlain with a gradational contact by ~3 m of foliated green shale.

Figure 22: Source of applied minerals

11.3 Soil Assessment

Soil is not only a support for vegetation, but it is also the pedosphere, the locus of numerous interactions between climate (water, air, temperature), soil life (micro-organisms, plants, animals) and its residues, the mineral material of the original and added rock, and its position in the landscape. During its formation and genesis, the soil profile slowly deepens and develops characteristic layers, called 'horizons', while a steady state balance is approached.

Soil users (such as agronomists) showed initially little concern in the dynamics of soil. They saw it as medium whose chemical, physical, and biological properties were useful for the services of agronomic productivity. On the other hand, pedologists and geologists did not initially focus on the agronomic applications of the soil characteristics (edaphic properties) but upon its relation to the nature and history of landscapes. Today, there is an integration of the two disciplinary approaches as part of landscape and environmental sciences.

Pedologists are now also interested in the practical applications of a good understanding of pedogenesis processes (the evolution and functioning of soils), like interpreting its

environmental history and predicting consequences of changes in land use, while agronomists understand that the cultivated soil is a complex medium, often resulting from several thousands of years of evolution. They understand that the current balance is fragile and that only a thorough knowledge of its history makes it possible to ensure its sustainable use.

Soil science is the study of soil as a natural resource on the surface of the Earth including soil formation, classification and mapping; physical, chemical, biological, and fertility properties of soils; and these properties in relation to the use and management of soils.

Sometimes terms which refer to branches of soil science, such as pedology (formation, chemistry, morphology, and classification of soil) and edaphology (how soils interact with living things, especially plants), are used as if synonymous with soil science. The diversity of names associated with this discipline is related to the various associations concerned. Indeed, engineers, agronomists, chemists, geologists, physical geographers, ecologists, biologists, microbiologists, silviculturists, sanitarians, archaeologists, and specialists in regional planning, all contribute to further knowledge of soils and the advancement of the soil sciences.

Soil scientists have raised concerns about how to preserve soil and arable land in a world with a growing population, possible future water crisis, increasing per capita food consumption, and land degradation. Dependence on and curiosity about soil, exploring the diversity and dynamics of this resource continues to yield fresh discoveries and insights. New avenues of soil research are compelled by a need to understand soil in the context of climate change, greenhouse gases, and carbon sequestration. Interest in maintaining the planet's biodiversity and in exploring past cultures has also stimulated renewed interest in achieving a more refined understanding of soil.

Most empirical knowledge of soil in nature comes from soil survey efforts. Soil survey, or soil mapping, is the process of determining the soil types or other properties of the soil cover over a landscape and mapping them for others to understand and use. It relies heavily on distinguishing the individual influences of the five classic soil forming factors. This effort draws upon geomorphology, physical geography, and analysis of vegetation and land-use patterns. Primary data for the soil survey are acquired by field sampling and supported by remote sensing

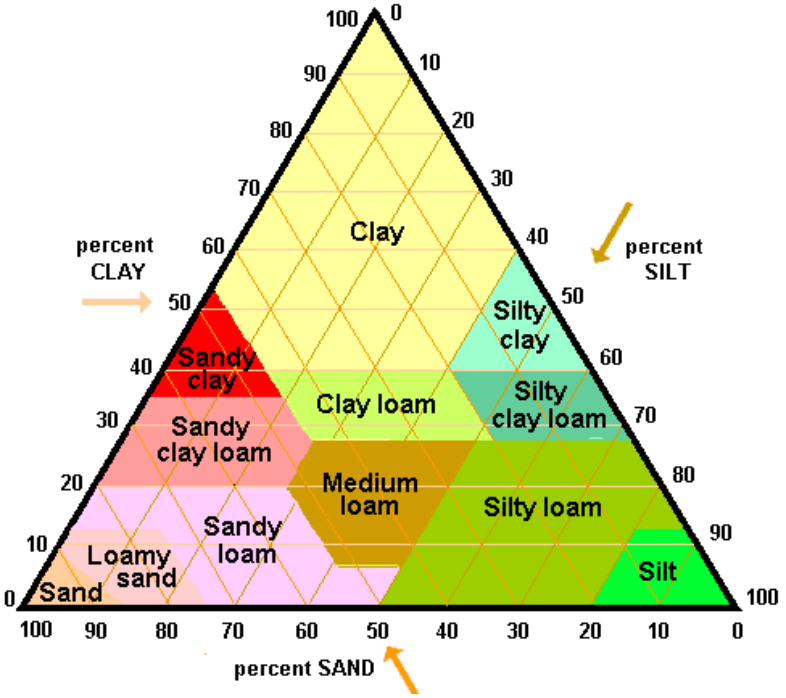


Figure 23: Soil Textural Triangle

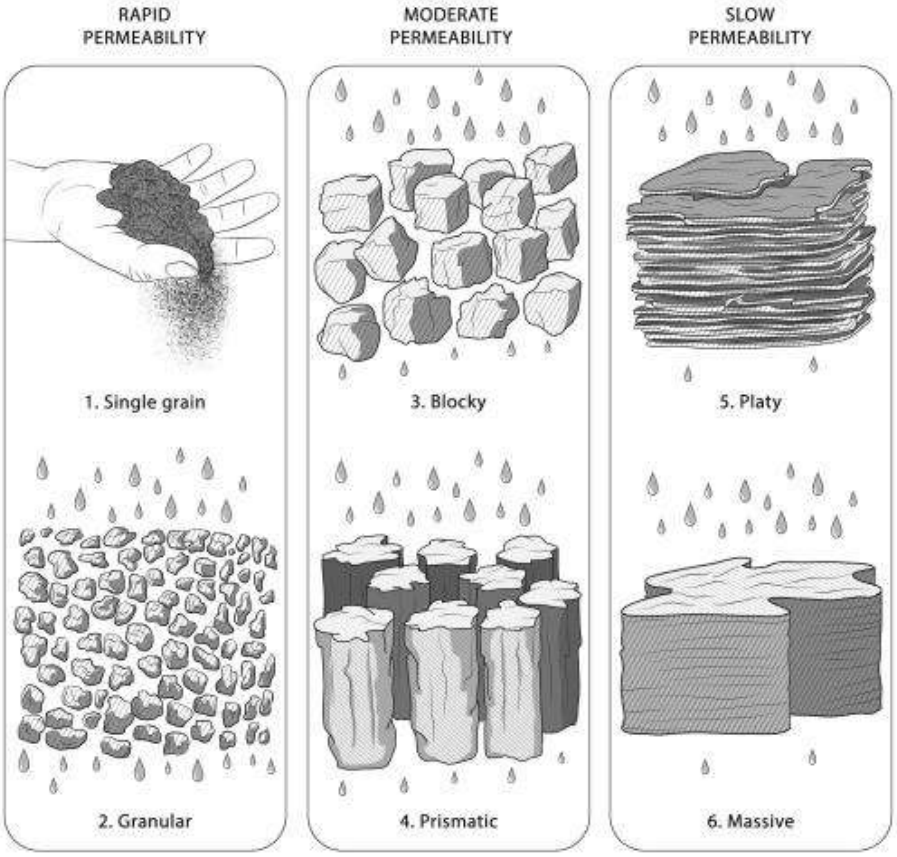


Figure 24: Soil Structure & Its Effects on Permeability

According to the Basic Soil Study (see Appendix 2), the soil was investigated by means of conducting auger drilling. The holes were drilled up to 23cm below ground level. The soil was described and classified according to the South African Taxonomic Soil Classification System.

Below is a snippet from the Basic Soil Study that was conducted. The impact parameter rating for the proposed project activities is as follows:

3	Moderate, short-term effects but not affecting ecosystem function. Rehabilitation requires intervention of external specialists and can be done in less than a month	On-going social issues. Damage to items of cultural significance. Local	Local Local extending only as far as the development site area	Medium term 1-5 years	Unlikely Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur

The proposed area of interest is composed of Association of Classes 13 and 16: Undifferentiated shallow soils, Association of Classes 1 to 4: Undifferentiated structureless soils, and land classes Red or yellow structureless soils with a plinthic horizon. Figure 25 was produced by the QGIS Technician and the properties of these soils is that they may receive water runoff from associated rock; water-intake areas and have restricted land use options.

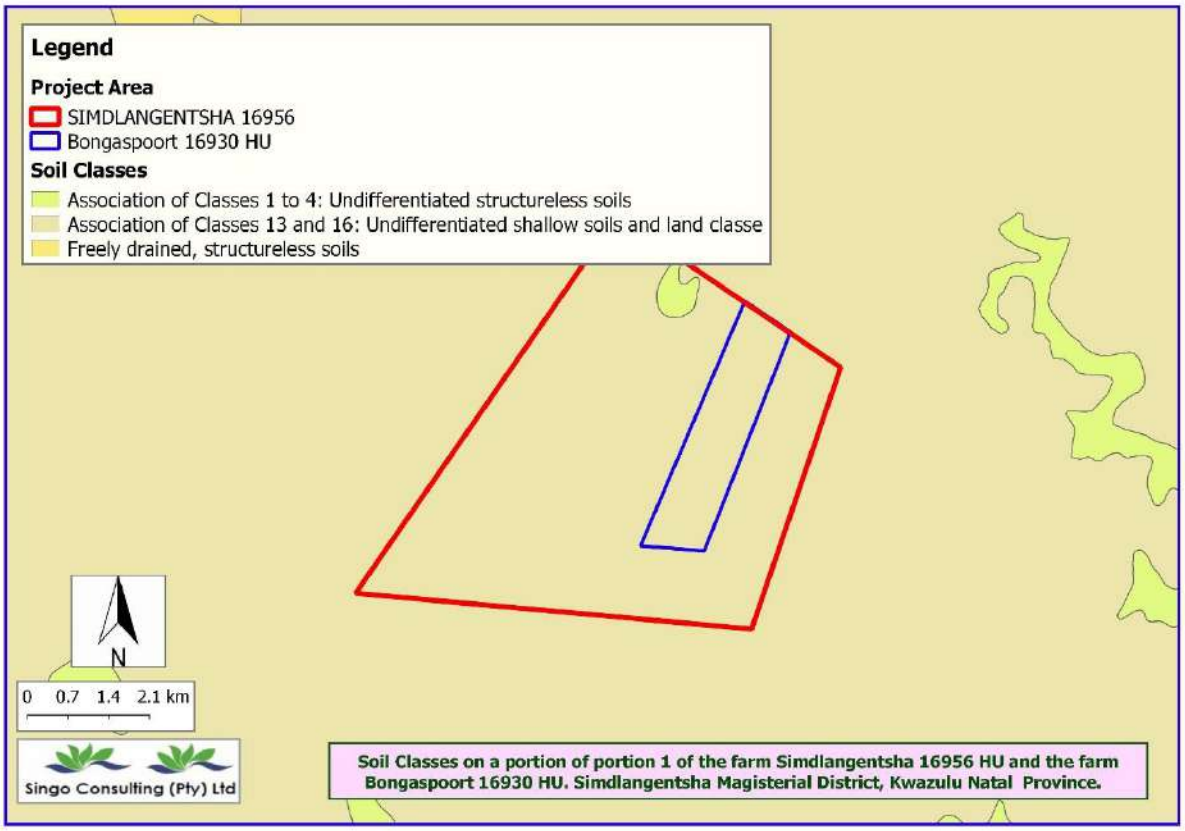


Figure 25: Soil class map of the proposed project area

Figure 26: Soil types observed on site

Evident from the soil, the area is fairly dry with the moisture availability ranging from none to slight (see Figure 27).

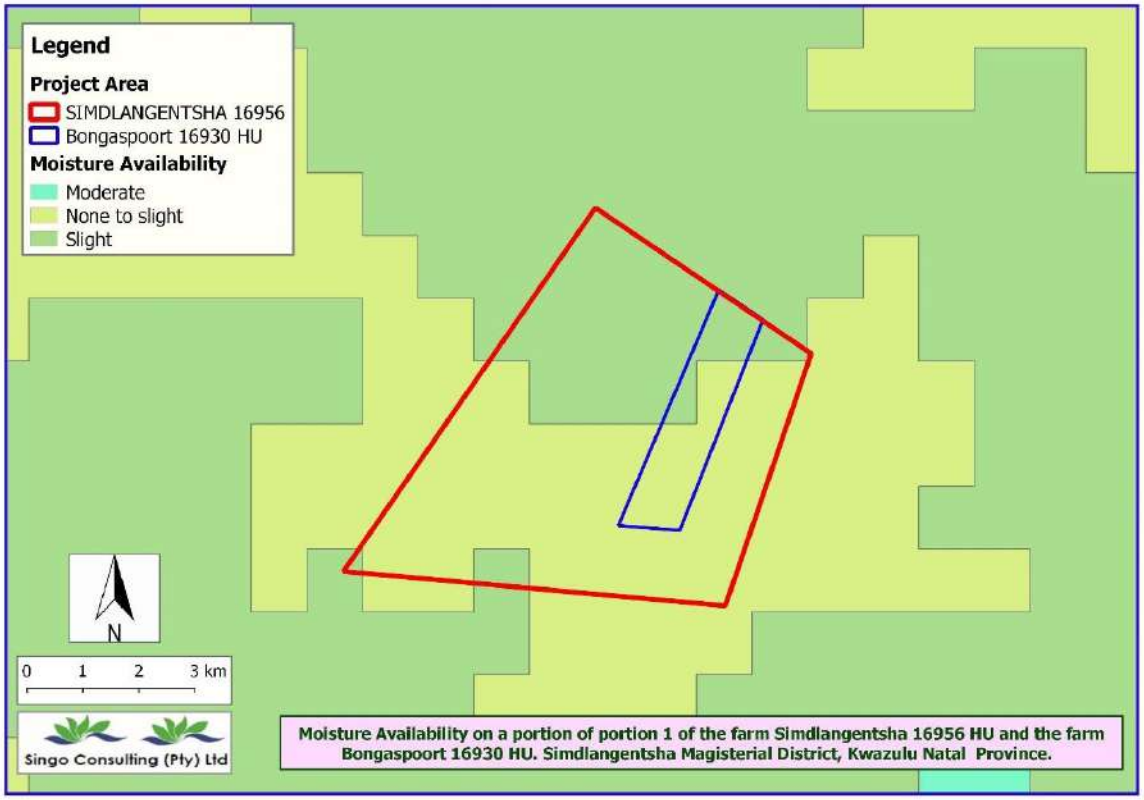


Figure 27: Moisture availability of proposed project area

11.4 Water Resources

An excerpt from a Surface Water hydrology Report states that South Africa is divided into 19 water management areas (National Water Resource Strategy, 2004), managed by its separate water board. Each of the water management areas (WMA) is made up of quaternary catchments, which relate to the drainage regions of South Africa, ranging from A – X (excluding O). These drainage regions are subdivided into four known divisions based on size.

It further elaborates that the letter A represents the primary drainage catchment, A2 for example will represent the secondary catchment, A21 represents the tertiary catchment and A21D would represent the quaternary catchment, which is the lowest subdivision in the Water Resources 2005 Study (WR2012, 2015) manual. Each of the quaternary catchments have associated hydrological parameters including area, mean annual precipitation (MAP) and mean annual runoff (MAR) to name a few.

The project area falls within both the W42L and W42J quaternary catchments. This WMA is situated in the northern KwaZulu-Natal province, but also occupies the south-eastern corner of the Mpumalanga province (west of Swaziland). This WMA borders both Swaziland and

Mozambique, and shares two the major rivers systems, namely the Usutu and Pongola with these countries.

The Indian Ocean borders the WMA in the east and the Drakensberg range in the border in north-west. Altitude ranges from approximately 2000m to sea level. Rainfall varies from almost 1500mm/annum in the western mountainous areas to as low as 600mm/annum in the Pongolapoort Dam vicinity.

The WMA consists of a number of catchments, namely the Mhlathuze, Mfolozi, Mkuze/Hluhluwe, Pongola, Usutu and Lake Sibaya catchments which all form part of the Usutu Basin (otherwise referred to as the Maputo River Basin). Mfolozi River Basin consists of two main tributaries, the Black and white Mfolozi, both which flow from the eastern Drakensberg Escarpment eastwards across the Zululand coastal plain into the Indian Ocean.

Mkuze catchment includes the drainage area of both the Hluhluwe and Mkuze rivers, reaching the sea through Lake St Lucia. Pongola rises in the eastern escarpment of the Drakensberg, flowing eastwards before joining the Usutu River and flowing through Mozambique into the Maputo River Basin. The Usutu River rises in the eastern escarpment of the Drakensberg, flowing eastwards through Swaziland and joining the Pongola River before crossing the Mozambique Border.

Lake Sibaya Catchment is a coastal catchment north of Sodwana Bay. This area has relatively high rainfall and limited surface runoff due to the flat terrain and supports high groundwater recharge area with the KwaZulu-Natal coastal aquifer underlying much of this catchment. The Pongola River runs through the project area towards the northern side of the project boundaries cutting through the Ubombo Mountains north towards the Maputo River.

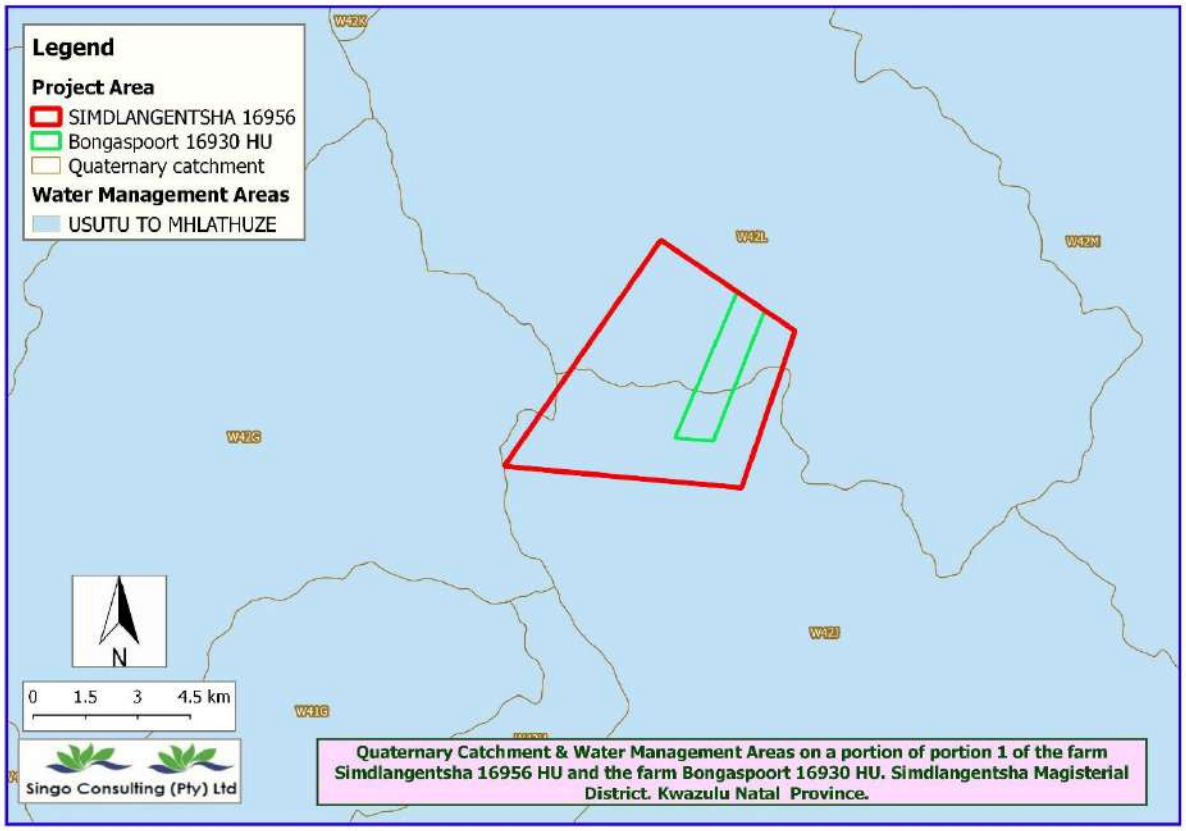


Figure 28: Quaternary catchment & water management area map

11.4.1 Surface Water

According to the hydrology map below, Mozana River transverses the northern side of the project area. There are a number of non-perennial rivers within the project boundaries. Furthermore, the presence of water bodies means that water resources on site must be protected. All activities must take place 500m away from the water bodies and if that cannot be then the water bodies must be channelled away from the site.

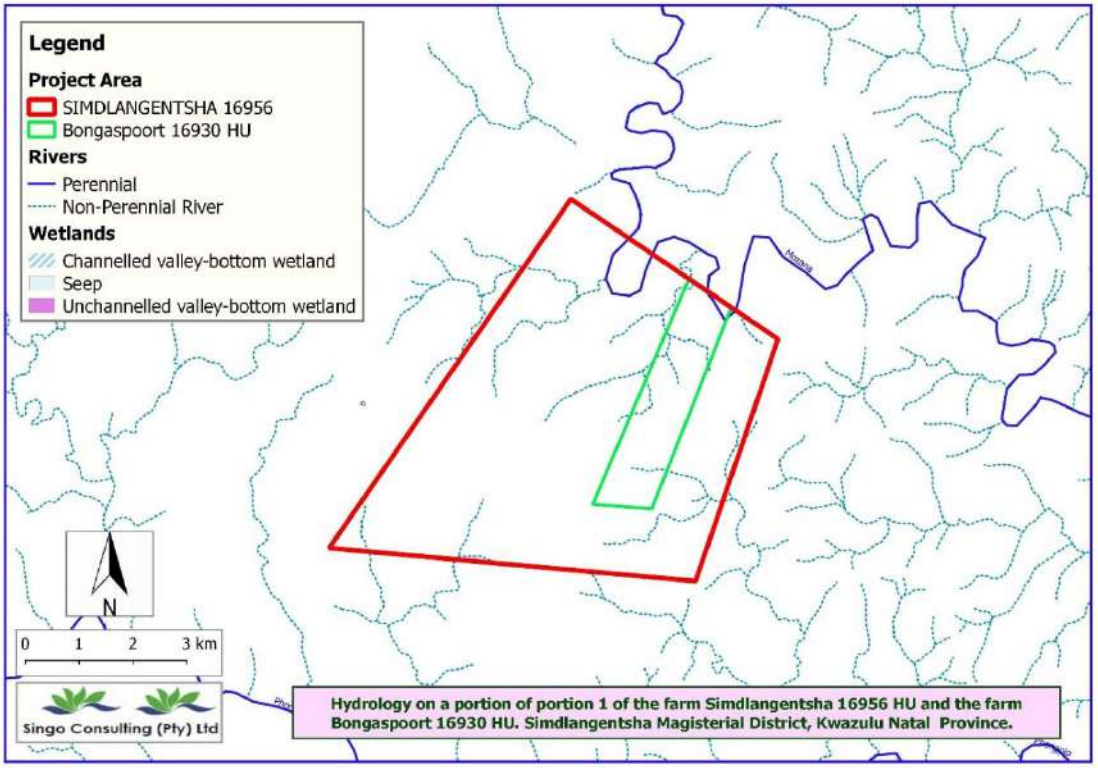


Figure 29: Hydrology Map of the proposed project area

Photo 6: Mozana River observed during site assesment

All activities must be conducted in a manner that ensures the protection of water resources from pollution; best practice guidelines must be applied. See Figure 30 for the hydrology buffer map of the applied for area.

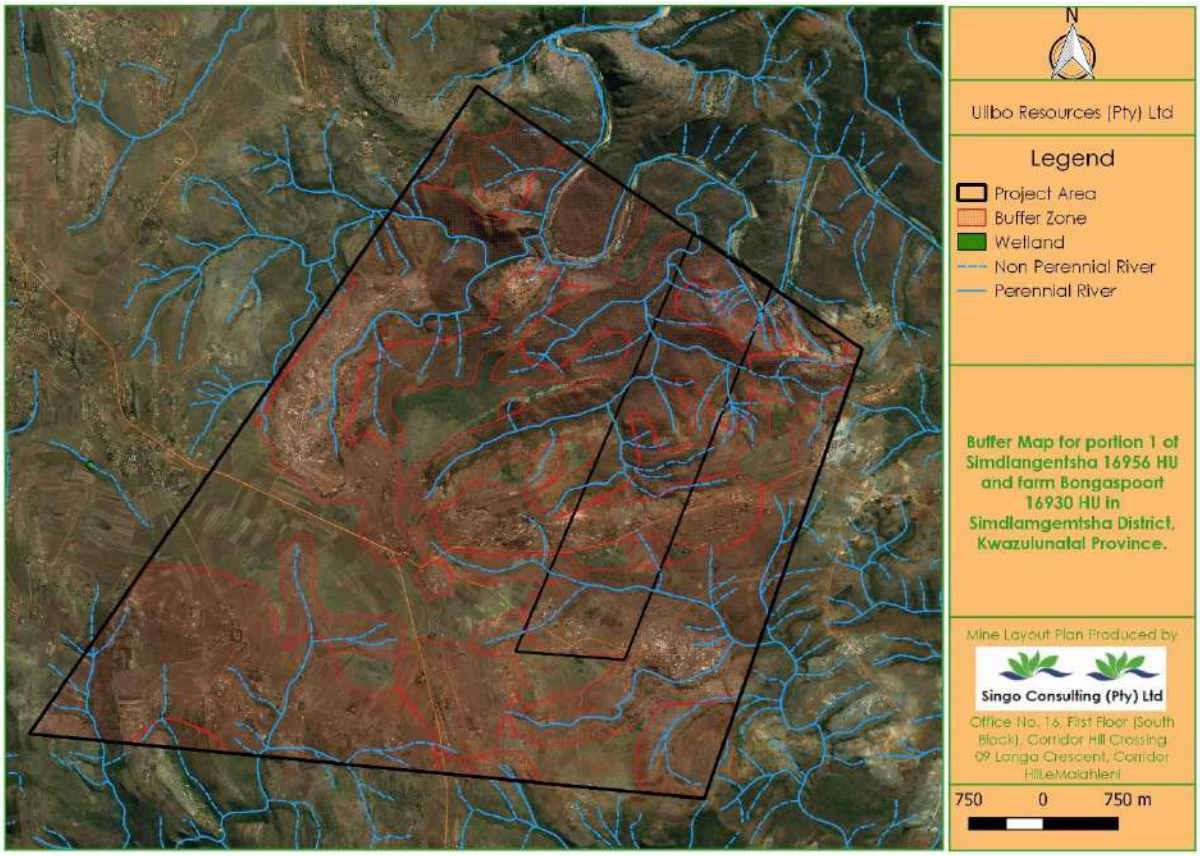


Figure 30: Buffer Map for Waterbodies within proposed project area

According to the Basic Hydrology Study (see Appendix 2), it can be concluded that the area is surrounded by various water bodies, however 100m buffers has been proposed, meaning no activities will take place within 100m from the water bodies. It is recommended that the applicant apply for a water use license in terms of chapter 4, of the National Water Act 36, 1998. This is due to the triggered section 21 c.

- The study area falls within the Usutu to Mhlathuze water management area, situated within the W42J and the W42L quaternary catchment area.
- Diamond drilling activities must not contaminate the water bodies on site.
- Rehabilitation must be ensured after the prospecting activities are done.
- Monthly water monitoring will be conducted to ensure that the prospecting activity is not contaminating the water bodies on site.

Recommendations as per the Basic Hydrology Study:

- On site there will be regular maintenance of the mobile toilets.
- Once drilling, the team will rehabilitate the area and ensure the core is out on site.
- Drilling within 100 meters of water resources will be avoided
- Stormwater will be prioritized, and the management to prevent surface water contamination.
- Clearing of vast amount of vegetation will be avoided, this is to preserve infiltration

11.4.2 Ground Water

Groundwater is the water present beneath Earth's surface in soil pore spaces and in the fractures of rock formations. A unit of rock or an unconsolidated deposit is called an aquifer when it can yield a usable quantity of water. The depth at which soil pore spaces or fractures and voids in rock become completely saturated with water is called the water table.

Groundwater is recharged from the surface; it may discharge from the surface naturally at springs and seeps and can form oases or wetlands. Groundwater is also often withdrawn for agricultural, municipal, and industrial use by constructing and operating extraction wells. The study of the distribution and movement of groundwater is hydrogeology, also called groundwater hydrology.

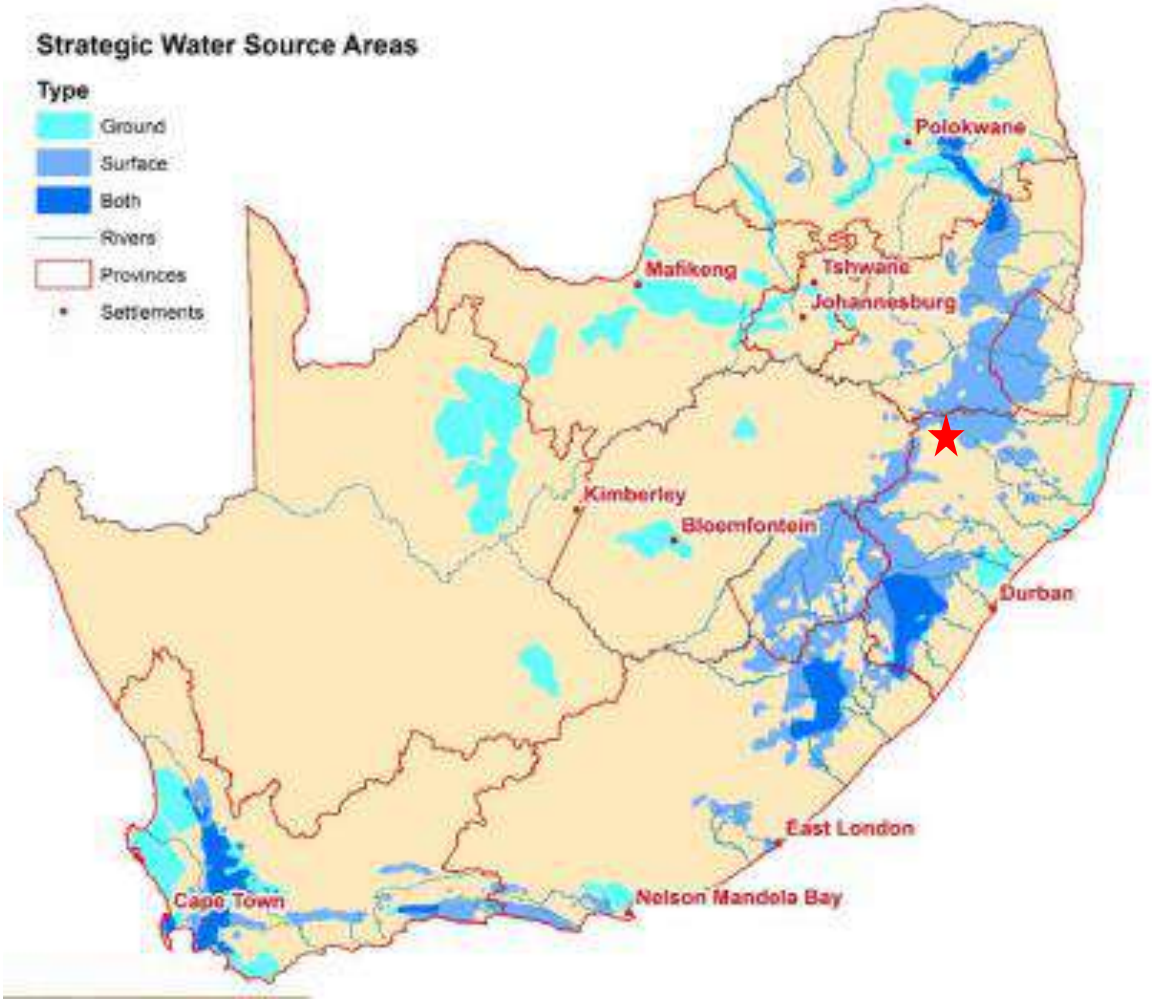


Figure 31: Spatial distribution of water resources in South Africa. Project area is the red polygon (www.nstf.org.za)

According to the Basic Hydrogeological Study (refer to Appendix 2), the primary concern is associated with hydrocarbon spillage, and reduction of infiltration due to clearing of vegetation in the prospecting area. The area falls on a minor aquifer and , depicts the target area as having primarily surface water. The groundwater vulnerability according to the drastic model is classified as moderate, which implies that the aquifer requires medium level of protection from the surface activity. The outlined groundwater management measures which include the availability of absorbent spill kits, regularly maintained of the mobile ablutions, and availability of the waste management bins. There will be compliance of the GN704 regulations, National waters Act No. 36 of 1998, NEMA Act 107 of 1998.

Figure 32 below illustrates the position of boreholes and dams within the quaternary catchment of the project area. No boreholes are recorded on the map below.

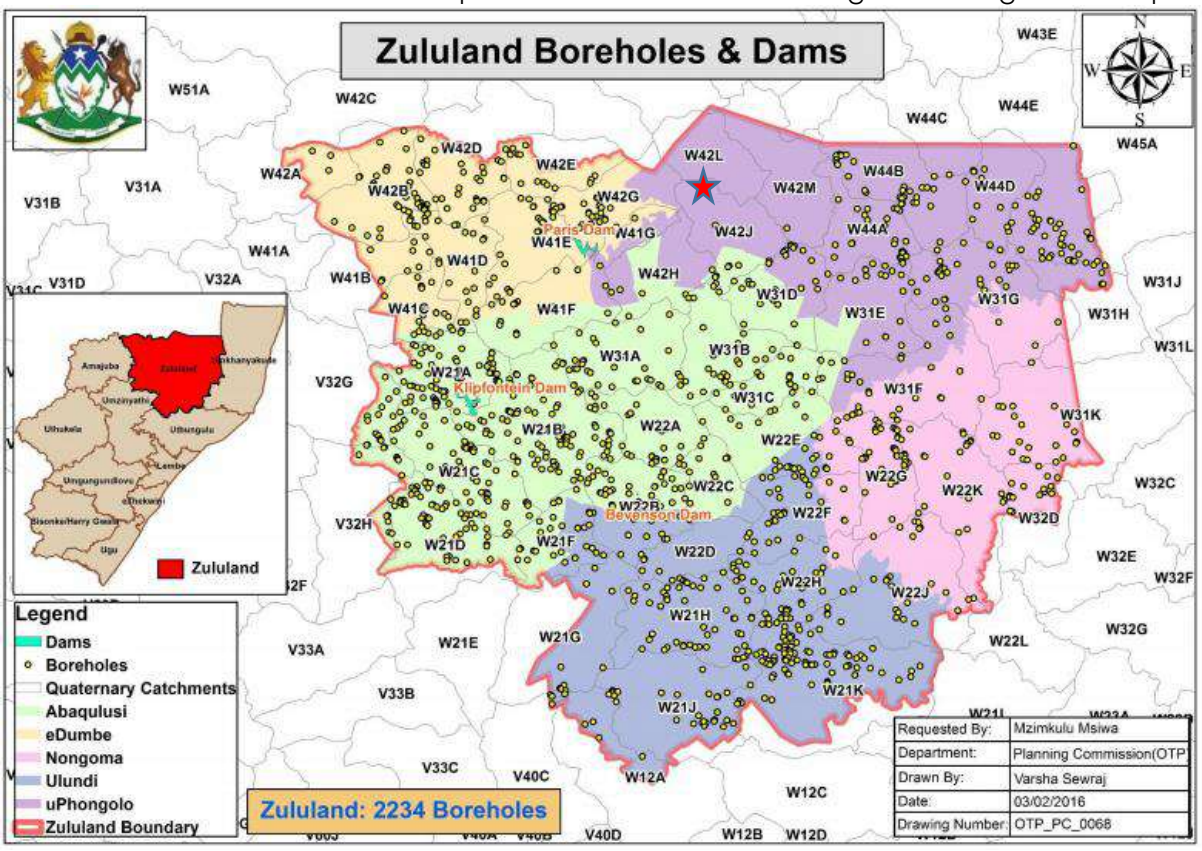


Figure 32: Boreholes and dams within the project areas district municipality and quaternary catchment. Project area is the red polygon (Source: http://www.kznppc.gov.za)

Recommendations as per the Basic Hydrogeology Study conducted:

➢ On site there will be regular maintenance of the mobile toilets.

➢ Once drilling, the team will rehabilitate the area and ensure the core is out of site.

➢ Drilling within 100 meters of water resources will be avoided

➢ The drilling machine used will be of minimum vibrations to avoid creating fissures in underlying rocks which could influence groundwater migration and leads to water contamination

➢ Clearing of vast amount of vegetation will be avoided, this is to preserve infiltration.

➢ Constant availability of waste bins; Compliance of National Environmental Management: Waste Management Act 59 of 2008.

➢ Compliance of GN 704 4(b) and 7(a) and National Water Act 36 of 1998 (Chapter 3 – Part 4, Section 1 (a)(b).

➢ No onsite vehicle or machinery repairs such as changing oil.

➢ No onsite storage of oil, diesel, or petrol.

➢ Cores will be logged on an impervious surface and will be cleared from the site immediately after logging.

➢ The area is mountainous, this increases run-off, wastewater from drilling will be channelled and collected.

11.5 Flora and Fauna

During site assessment, the Mozana perennial river was identified onsite. The identified river was found to have high ecological importance and high conservation importance as it provides livestock with drinking water, habitat for aquatic animals and form part of the sources of freshwater in south Africa. The Mozana river is considered highly sensitive area where ecological impacts would be more significant. All the proposed buffer-zones as per the wetland assessment report should be considered to conserve the river. Therefore, when choosing areas to be prospected, the applicant should avoid disturbance of the sensitive areas. In case if drilling must occur in the regulated area, a permit application needs to be lodged with DWS prior to any disturbance of the sensitive area. A permit application should be lodged in terms of Section 21 (I) and (C) of the (National water Act NO. 36 of 1998).

Some of the proposed areas onsite were covered with natural vegetation. The areas covered with natural vegetation have high conservation importance as they provide suitable habitat and feeding areas for livestock and wild animals species. Vegetation should not be cleared, as it leads to habitat loss, degradation and fragmentation including, inter alia, exotic species encroachment and dust generation. The applicant must ensure that animals should not be intentionally killed/poached if identified onsite. There should be a relocation of any threatened mammal species identified onsite before commencement of prospecting.

According to the Basic Ecology Study, these impacts can be mitigated through correct and active management. Proper rehabilitation and after-care of the prospected area needs to take place to prevent the colonisation of the areas by invader species. It is recommended that the management measures stipulated in this report be included in the proposed project's official EMP and that these be assessed for efficacy during all phases of the project and adapted accordingly to ensure minimal disturbance of the study area ecology.

Recommendations as pr the Basic Ecology Study:

- All ablution facilities must be placed far away from the waterbodies.
- When placing structures in the prospecting area, highly sensitive areas must be avoided.
- An alien and invasive management plan, as well as emergency preparedness plan during spillages must be always adhered to.
- Excavated areas must be rehabilitated to avoid or limit erosion.
- Drilled boreholes must be capped to avoid injuries to animals

11.5.1 Flora

The project area falls within the Grassland Biome, which occurs mainly on the high central plateau of South Africa, the inland regions of KwaZulu-Natal and the Eastern Cape (Rutherford and Westfall,1994). The majority of plant species within grasslands are non-grassy herbs (forbs), most of which are perennial plants with large underground storage structures. Tree species are limited due to frost, fire, and grazing, which maintains the herbaceous grass and forb layer and ultimately prevents the establishment of tall woody plants (Tainton, 1999).

The Grassland Biome has an extremely high biodiversity, second only to the Fynbos Biome. At the 1000 m2 scale, the average species richness of the Grassland Biome is even higher than that of most Fynbos communities (Cowling et al., 1997; van Wyk, 2002), being surpassed only by the Renosterveld. Given that most rare and threatened plant species in South Africa's summer rainfall region are restricted to high-rainfall grasslands, this type of vegetation is in the most urgent need of protection (60% destroyed and only 2.2% conserved).

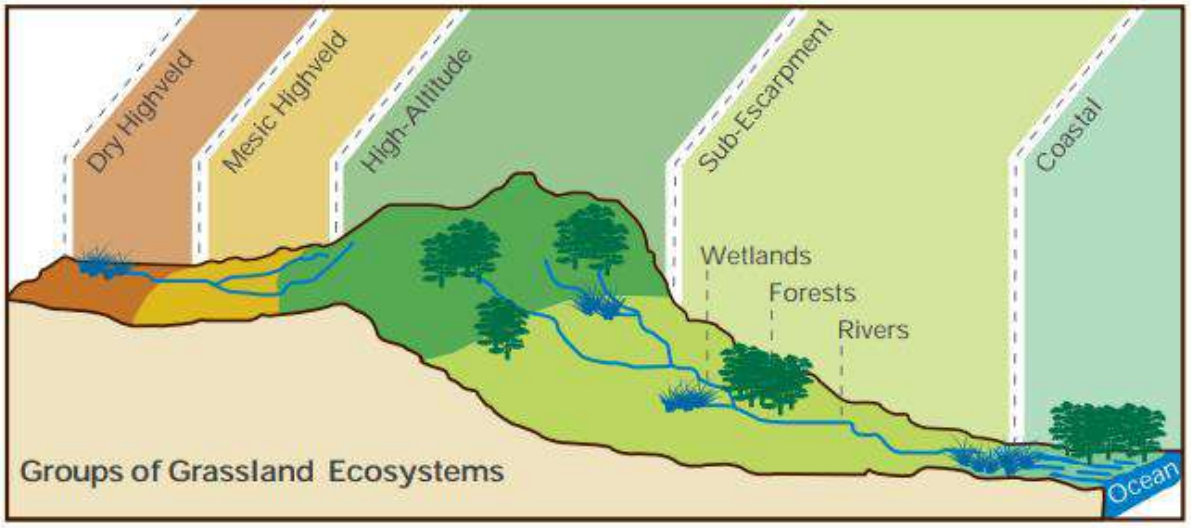


Figure 33: Groups of Grassland Ecosystems

According to Figure 34, the project site is located within the North-Eastern Mountain Grassland. Mountain grassland (also referred to as meadow) is characterized by an absence or very low cover of trees and shrubs, and dominance by grasses and forbs. Species composition changes substantially with soil conditions, and grazing history (Redders 2003a).

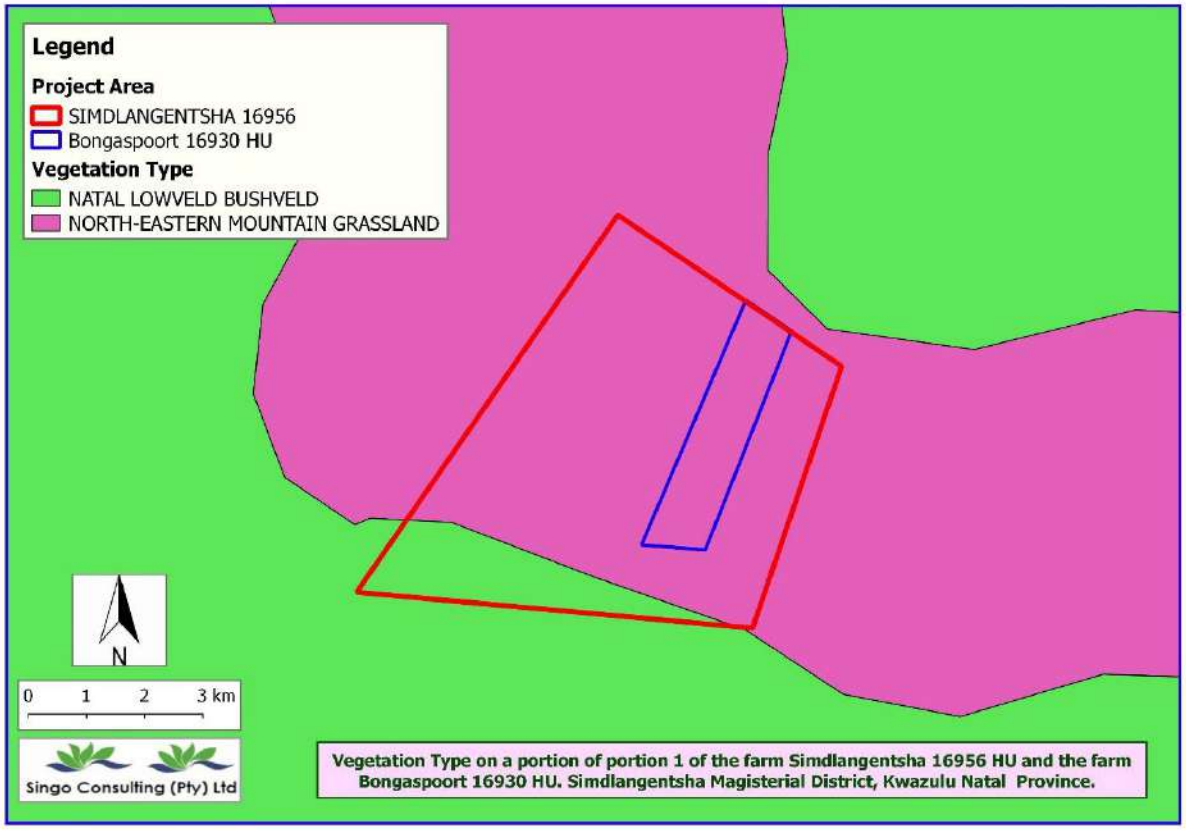


Figure 34: Vegetation Map of Proposed Project Area

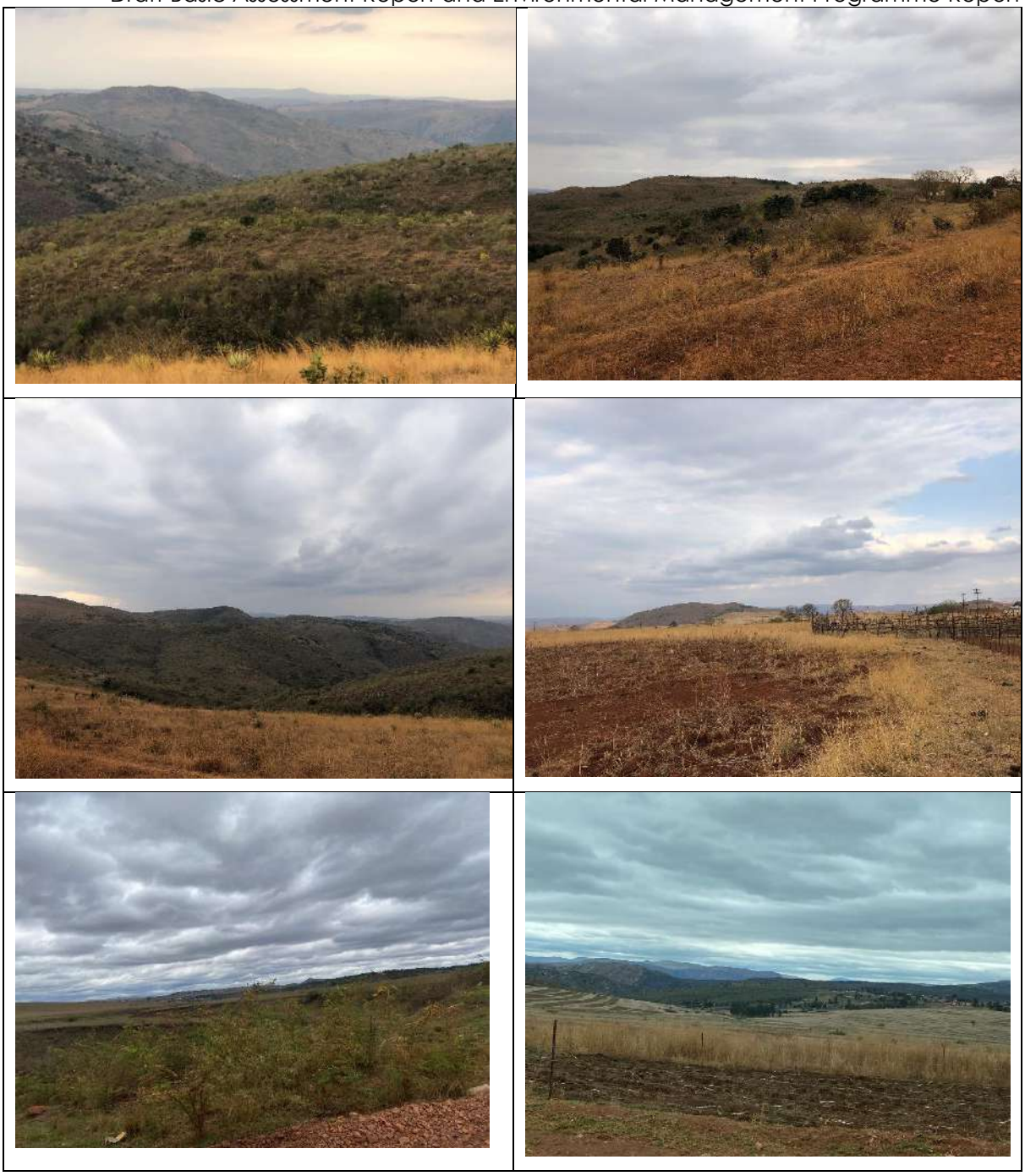


Photo 7: Vegetation seen at the site

11.5.2 Fauna

The proposed land is still natural except small areas where erosion occurred, the status of the area it is still in good condition where most of fauna depend on the area for living. Small mammals, reptiles and insects are using the proposed land for habitat and living's needs.

Example of fauna species that might found in the proposed land are Reptilia-Dendroaspis angusticeps, Mammalia-Philantomba monticola, Myosorex cafer and Cercopithecus

albogularis labiatus and Insecta-Durbania amakosa flavida, Durbania amakosa albescens. All the mentioned species in this paragraph are classified as medium sensitivity as confirmed by screening report.

Photo 8: Cattle Spotted during site assessment

Avifauna

Birding is best in the warmer summer months, but winter provides large congregations of water birds around nationally important wetlands. The hot, wet season – best for birding – starts in September and ends in March. The cool, dry season runs from April to August.

The site assessment for this proposed project was conducted during August which according to the BLSA is a dry season thus there was not a lot of bird sightings. Prospecting activities will be conducted during these dry seasons to protect the integrity of the any species that may be present during rainy and warm seasons.

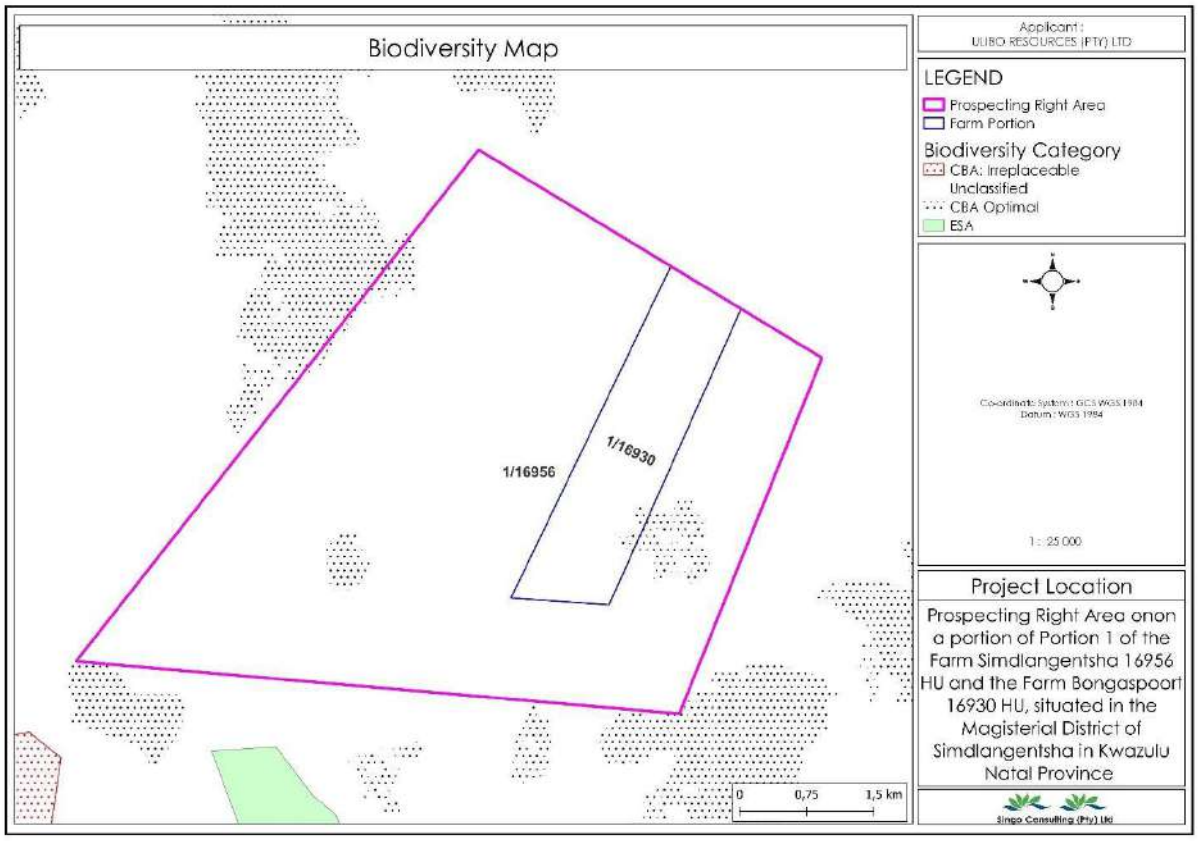


Figure 35: Critical Biodiversity Map

According to the map above, majority of the proposed project area is unclassified. Site assessment also confirmed that the area does not have any protected trees as well as endangered species.

Regardless, all flora and fauna species will be conserved, & all potential impacts on floral and faunal species will be managed using management framework stipulated on the National Environmental Management: Biodiversity Act (Act No. 10 of 2004).

11.6 Heritage Resources

Heritage resources such as Stone Age sites, rock paintings and engravings; stone tools; small, inconspicuous stone walled sites from the Late Iron Age farming communities; formal and informal graveyards, etc. may occur in the study area.

It is essential to note that it is possible that the Phase 1 HIA may have missed heritage resources in the project area, as some heritage sites may occur in thick clumps of vegetation while others may lie below the surface of the earth and may only be exposed once development commences.

Should, however, any heritage resources of significance be exposed during the rather operational phase of the project, the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development activities should be stopped, and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notified to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the required mitigation measures.

The desktop study and site assessment did not reveal any historical sites or graves within the proposed project area. Due to the fact that the proposed project area has settlements around and within the project boundaries, and also due to the fact that it is a rural settlement which has tribal authorities, it is likely that there are graves within the project area. This will be confirmed during the meeting we will have with the chiefs. Should there be discoveries of graves and historical infrastructure, buffer zones will be implemented within the environmental management plan.

12 Socio-Economic Environment

The study area for the proposed projects is in the uPhongolo Local Municipality, strategically located within the Zululand District in KwaZulu-Natal Province. The uPhongolo Local Municipality is a Category B municipality located in the north of the Zululand District in KwaZulu-Natal. It lies adjacent to the Swaziland Border and the Mpumalanga Province Border.

Main access to the municipality is via the N2 from Gauteng in the north-west and Durban in the south. The municipality provides regional access to a wide range of tourist activities outside its own boundaries. Main rivers in the municipality are the Mkuze River in the south and the Pongola River in the north, the latter feeding the Pongolapoort Dam located on the eastern boundary of the municipality.

The municipality contains, in overall terms, very low settlement densities, while on the other hand containing substantial recreational and tourism opportunities whilst the main economic sectors are agriculture and tourism.

12.1 Population Distribution

According to the 2018-2019 final IDP, the total population of the uPhongolo Municipality is estimated at 141 247 people represented into 34 228 households. Ethnically, the population is grouped as follows: Africans 98.5%, Coloureds 0.0%, Asians 0.01%, and whites 1.44%.

Trends	No.	Percentage
Black African – Total	132 270	98,54
Coloured – Total	6	0,00
Indian or Asian – Total	18	0,01
White – Total	1 937	1,44
Total	**134 231**	**100**

Figure 36: Population distribution of 2015 (Source: uPhongolo Final 2018-2019 IDP)

The black African population group makes up about 98% of the total population in the municipality, and 94% speak isiZulu as their home language. Females make up about 53% of the municipality's population.

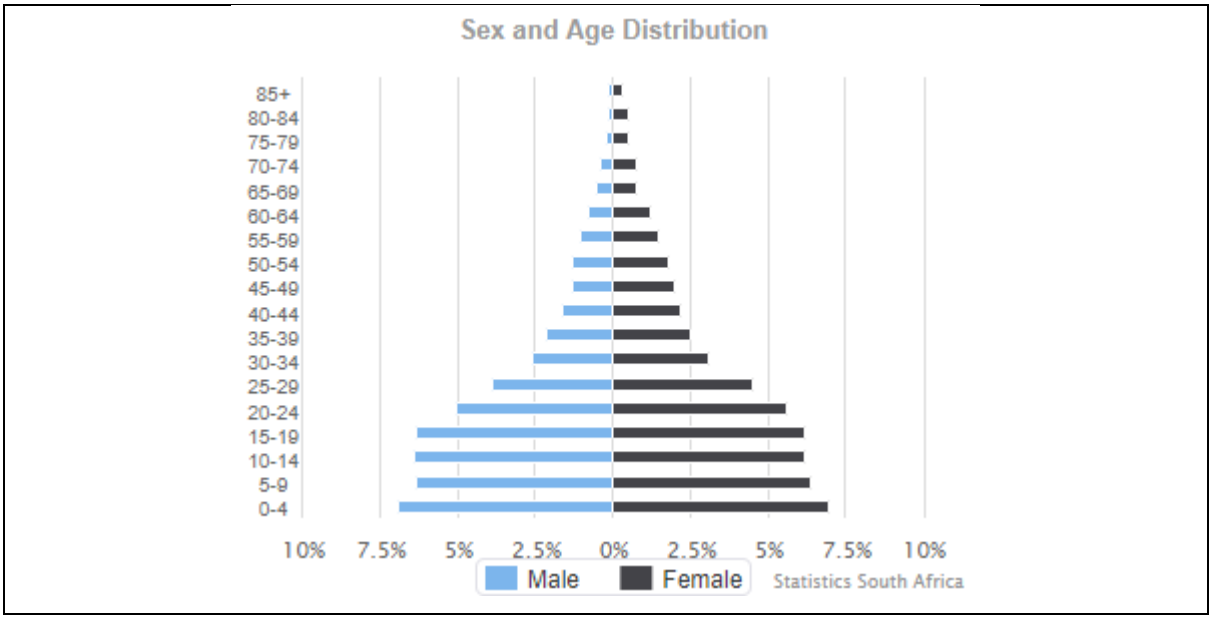


Figure 37: Population Distribution by Age and Gender (Source: Stats SA)

12.2 Economy

According to the draft 2018-2019 IDP, Government services and manufacturing are the major sectors that contribute to the GDP of the Municipality contributing approximately 23.5% and 16% respectively. Those sectors are followed by the wholesale and retail 12.6% as well as the agriculture sector 11.6%. However, construction, Community, social and personal services, financial and transport sectors also play a visible role to the municipal GDP. It is evident from

the figure below that mining and quarrying industry has the smallest contribution to the GDP.

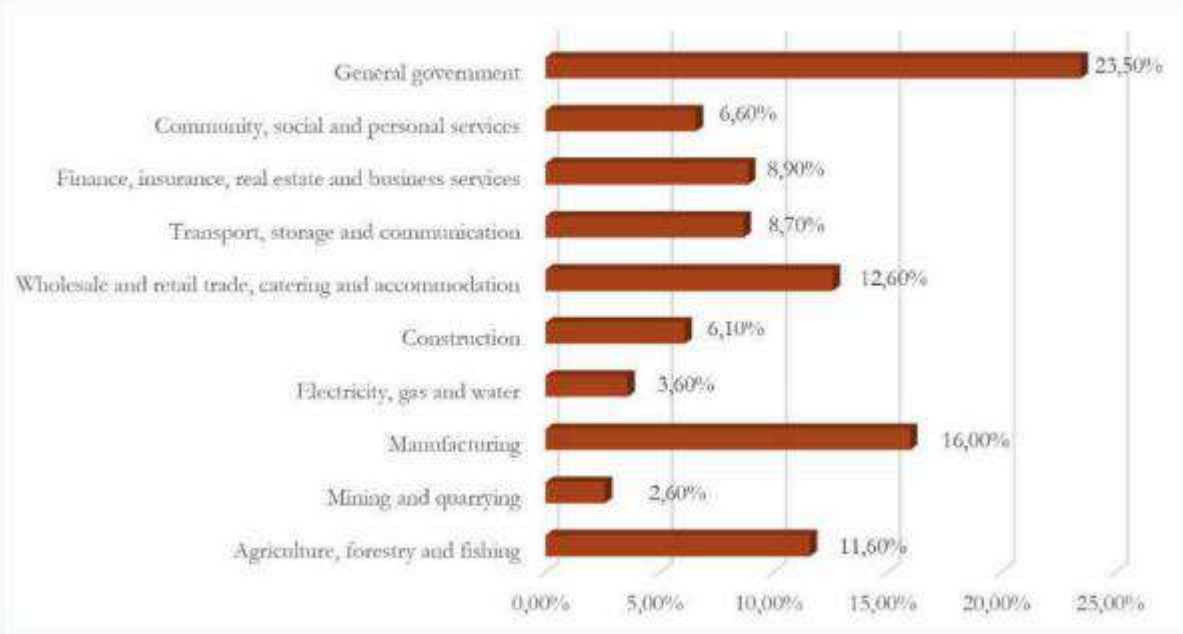


Figure 38: GDP per sector (Source: uPhongolo Final 2018-2019 IDP)

12.3 Unemployment Rate

According to the municipal IDP, 17% of the population is unemployed, 30% of the population is employed and 53% of the population is not economically active. (uPhongolo Final 2018-2019 IDP).

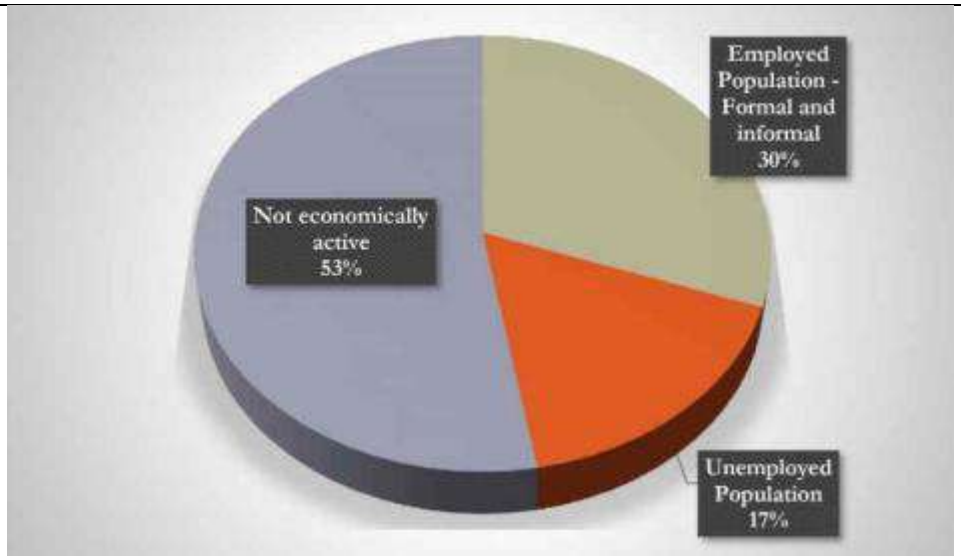


Figure 39: Employment Status (Source: uPhongolo Final 2018-2019 IDP)

12.4 Income Distribution

According to the municipal IDP, 13% of households receive no income. 99.8% of the population earn between R 801 and R 1600 per month, while 8% of the population earn between R6400

and R12 000 per month. There are couple of households in the Municipality that earn R 25 000 monthly. See

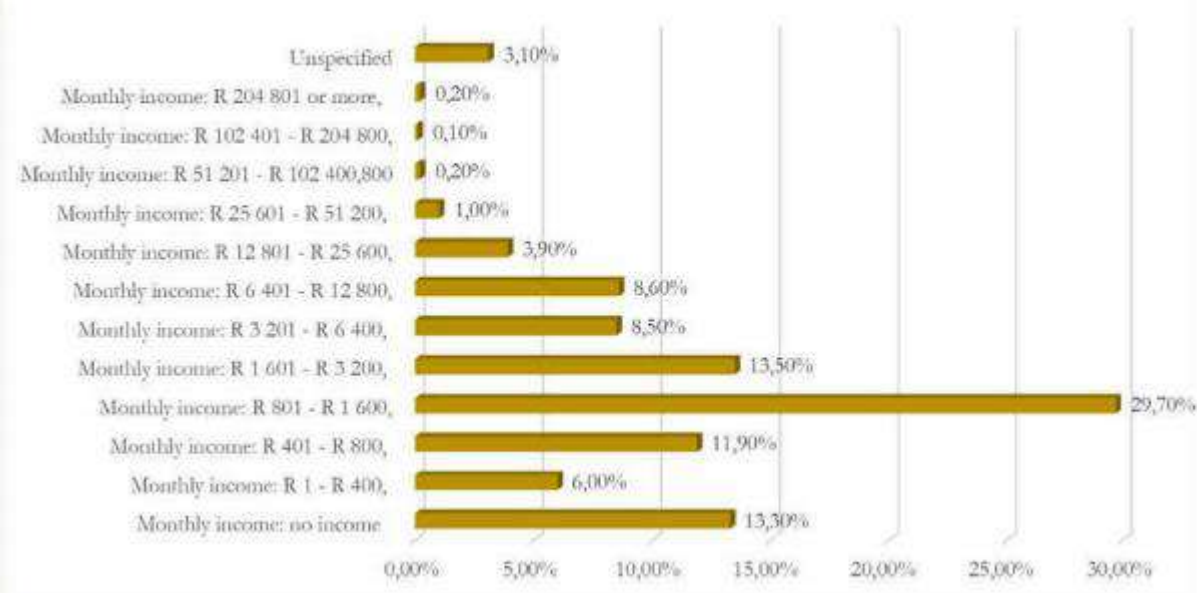


Figure 40: Monthly income profile (Source: uPhongolo 2018-2019 Final IDP)

13 Description of the current land uses

The determination of the existing site specific and surrounding land use provides input into the process of impact identification and the establishment of closure objectives. Site specific land use has been confirmed as grazing. Rehabilitation objectives to restore the site to pre-prospecting state must consider safety matters and an effective re-vegetation effort to reverse the impacts as far as is practicable.

According to the land use map below the prospecting area comprises mostly of cultivated and uncategorized land. There are sections within the project boundaries which from the map below are built-up, natural and degraded. The project area cuts through Mozana Rivier which runs on the degraded section towards the northwestern side of the project area.

Land uses within a 3 km radius are inclusive of the following:

- Agricultural fields (maize)
- Cattle farming
- Sheep farming
- Unpaved roads
- Homesteads
- Waterbodies
- Cultivated & natural land

- Mine

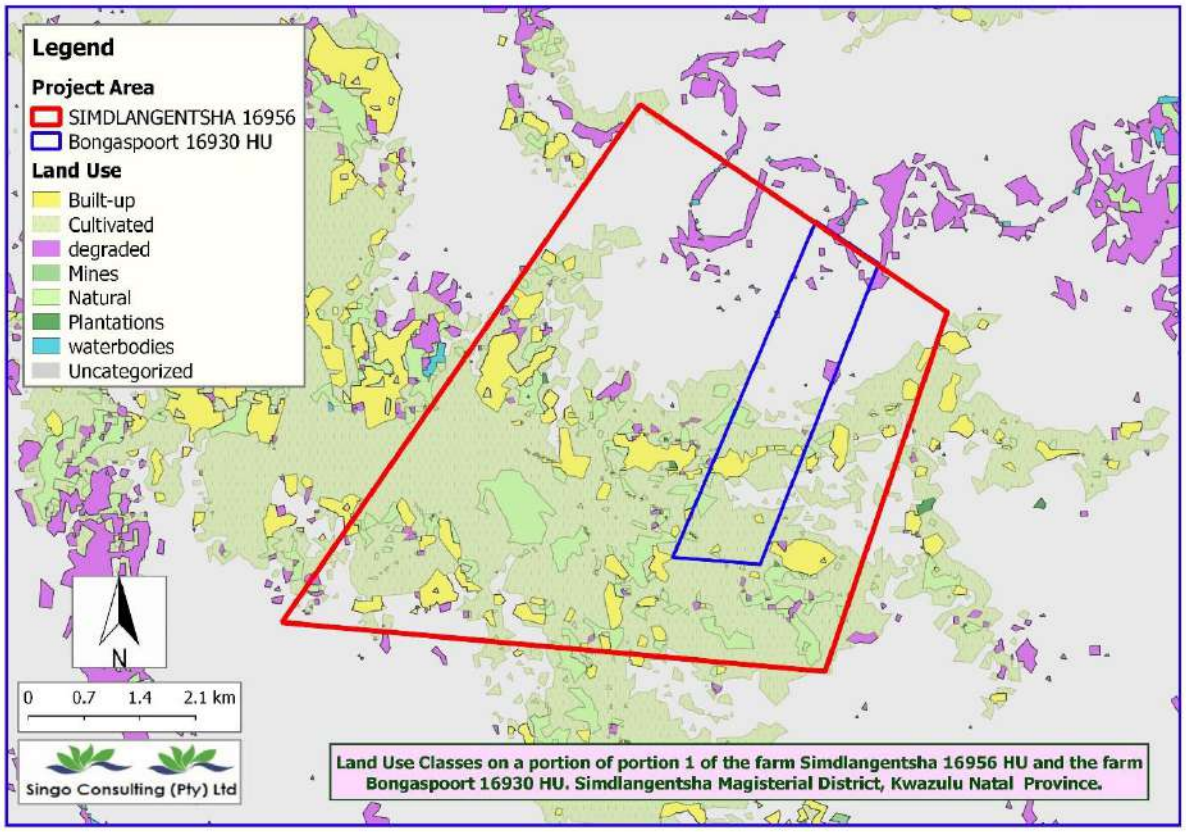


Figure 41: Land use map

Bosveld Mine (Klipwal Glod Mine) is located 1.79 km from the coordinates of point C of the proposed project and can be accessed via the roads D2140 and D1869.

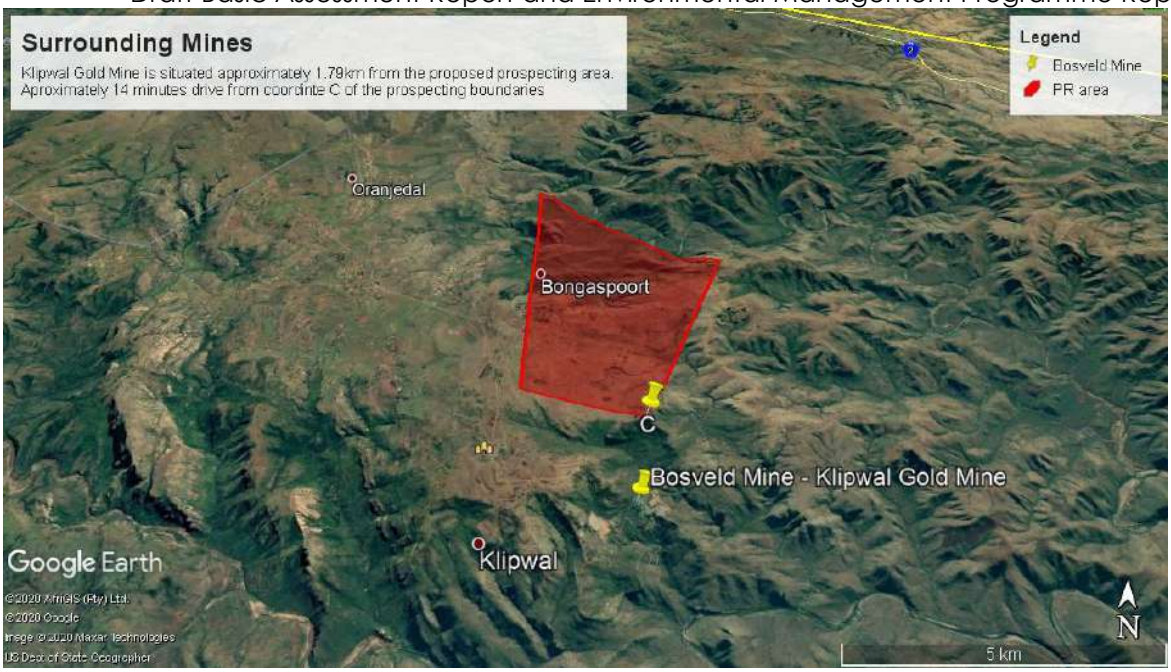


Figure 42: Mine in close proximity

The Land capability classification is one of several interpretation groups that was made for agricultural purposes. As with all the interpretation groups, the land capability classification starts with one soil-mapping unit, which is the building block of the system.

The land capability of the proposed area is classified as grazing land and arable land. In this classification the arable soils are grouped according to their potentialities and limitations for sustained production of the common cultivated crops that do not require specialized site conditioning or site treatment. Nonarable soils (soils unsuitable for long time sustained use for cultivated crops) are grouped according to their potentialities and limitations to produce permanent vegetation and according to their risks of soil damage if mismanaged.

Arable land is any land capable of being ploughed and used to grow crops and Wilderness are natural environments on Earth that have not been significantly altered by human activity, or any nonurbanized land that has not been extensively cultivated by agriculture.

The majority of the proposed project area is made of land that can be used for grazing of livestock. During site inspection it was notable that the project area is a village thus the area has cattle and goats roaming the area. Should prospecting be successful, the livestock owners will be notified of when prospecting is to occur so that animals can be placed away from the prospecting area. Furthermore the prospecting area will be barricaded so that the animals do not go into the proposed prospecting area.

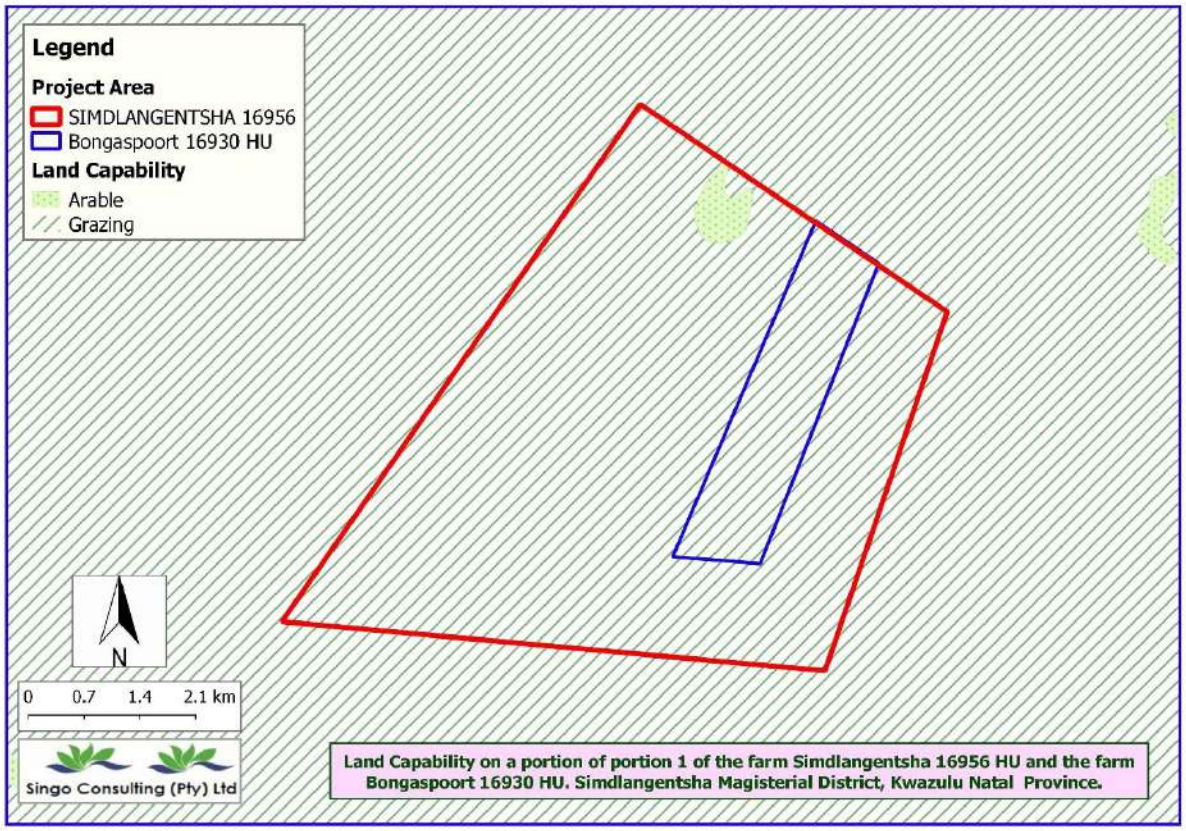


Figure 43: Land capability map

Refer to land capability map above illustrating that majority of the land is used for grazing.

Photo 9: Land capability observed on site

Figure 44: Map Illustrating Farming Type within Prospecting Area

14 Description of specific environmental features and infrastructure on the site*

On the project area there's existing buildings or infrastructure such as houses and powerlines passing-by especially in the southern part of the proposed project area where we find settlements. From the desktop survey of the project areas together with the actual site assessment, there are no critical biodiversity area.

Photo 10: Infrastructure on Site

15 Environmental and current land use map

(Show all environmental, and current land use features)

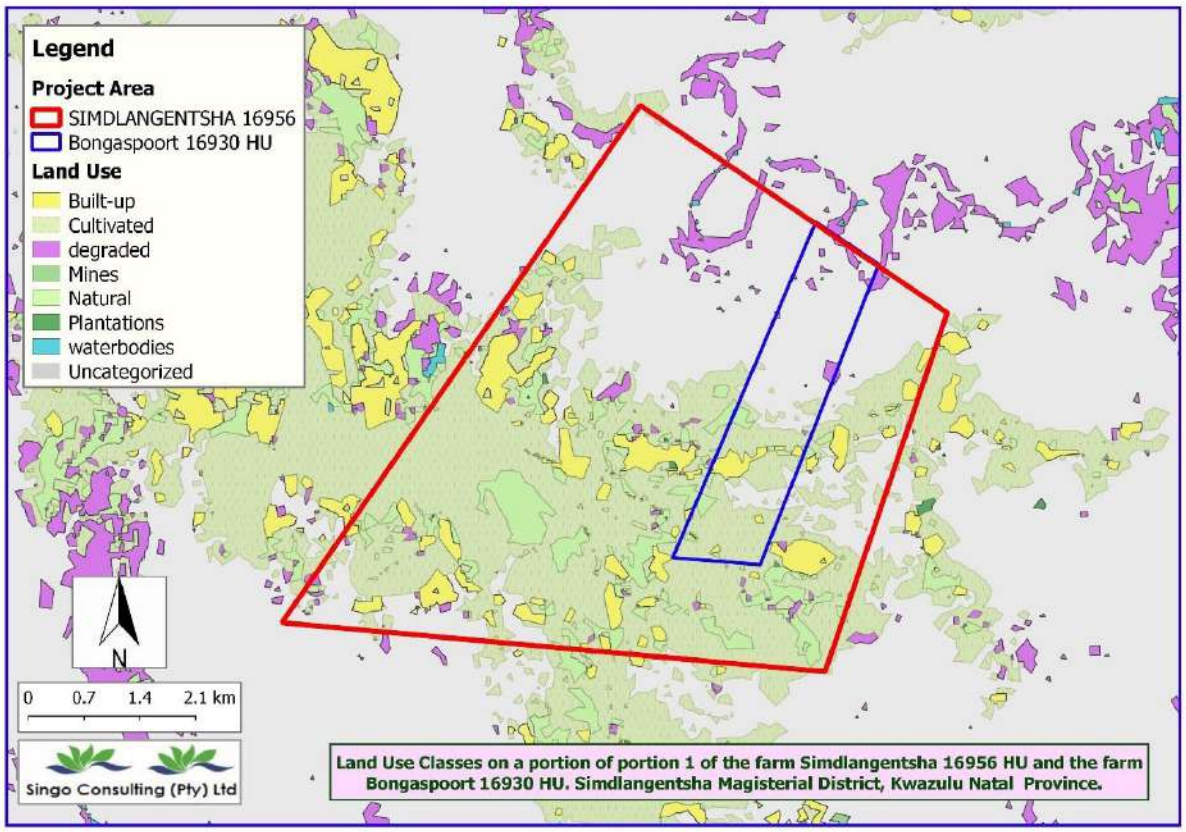


Figure 45: Land use map

Please refer to topography, hydrology and vegetation and land use map above, indicating the environmental and land use features associated with the proposed prospecting area.

16 Impacts and risks identified including the nature, significance, consequence, extent, duration, and probability of the impacts, including the degree to which these impacts can be reversed

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

Table 12: Severity Criteria

INTENSITY = MAGNITUDE OF IMPACT	***RATING***
Insignificant: impact is of a very low magnitude	*1*
Low: impact is of low magnitude	*2*
Medium: impact is of medium magnitude	*3*
High: impact is of high magnitude	*4*
Very high: impact is of highest order possible	*5*

FREQUENCY = HOW OFTEN THE IMPACT OCCURS	***RATING***
Seldom: impact occurs once or twice	*1*
Occasional: impact occurs every now and then	*2*
Regular: impact is intermittent but does not occur often	*3*
Often: impact is intermittent but occurs often	*4*
Continuous: the impact occurs all the time	*5*

DURATION = HOW LONG THE IMPACT LASTS	***RATING***
Very short-term: impact lasts for a very short time (less than a month)	*1*
Short-term: impact lasts for a short time (months but less than a year)	*2*
Medium-term: impact lasts for the for more than a year but less than the life of operation.	*3*

Long-term: impact occurs over the operational life of the proposed extension.	*4*
Residual: impact is permanent (remains after mine closure)	*5*

EXTENT = SPATIAL SCOPE OF IMPACT/ FOOTPRINT AREA / NUMBER OF RECEPTORS	***RATING***
Limited: impact affects the mining area	*1*
Small: impact extends to the neighbouring farmers	*2*
Medium: impact extends to surrounding farmers beyond the immediate neighbours	*3*
Large: impact affects the area covered by the municipal area	*4*
Very Large: The impact affects an area larger than the municipal area	*5*

PROBABILITY = LIKELIHOOD THAT THE IMPACT WILL OCCUR	***RATING***
Highly unlikely: the impact is highly unlikely to occur	*0.2*
Unlikely: the impact is unlikely to occur	*0.4*
Possible: the impact could possibly occur	*0.6*
Probable: the impact will probably occur	*0.8*
Definite: the impact will occur	*1*

Negative impacts:

≤1	*Very low*	*Impact is negligible. No mitigation required.*
>1≤2	*Low*	*Impact is of a low order. Mitigation could be considered to reduce impacts. But does not affect environmental acceptability.*
>2≤3	*Moderate*	*Impact is real but not substantial in relation to other impacts. Mitigation should be implemented to reduce impacts.*
>3≤4	*High*	*Impact is substantial. Mitigation is required to lower impacts to acceptable levels.*
>4≤5	*Very High*	*Impact is of the highest order possible. Mitigation is required to lower impacts to acceptable levels. Potential Fatal Flaw.*

Positive impacts:

≤1	*Very low*	*Impact is negligible.*
>1≤2	*Low*	*Impact is of a low order.*
>2≤3	*Moderate*	*Impact is real but not substantial in relation to other impacts.*
>3≤4	*High*	*Impact is substantial.*
>4≤5	*Very High*	*Impact is of the highest order possible.*

Table 13: Impact Significance Calculation – Construction, Operational and Rehabilitation Phase

Unite Number	Activity	Aspect	Impact	Significance Rating Before Mitigation Measures									Mitigation Measures	Significance Rating after Mitigation Measures								
				I	F	D	E	P	S	C	IS	SIGNIFICANCE		I	F	D	E	P	S	C	IS	SIGNIFICANCE
1,0	Employment of workers and procurement of materials	Social	Creation of employment. The nature of the project is one where a contractor is outsourced therefore the project is minuscule and only general workers	1	1	1	1	0,4	1,0	1,0	0,4	(P) Very Low	Procumbent opportunities will be maximized as much as possible. Services may be sourced from the local community.	2	1	1	1	0,6	1,3	1,2	0,7	(P) Very low

			may be employed																		
2,0	*Transportation of equipment and material to site*	*Air Quality*	*Dust generation emanating from the movement of the drill rig onto the site.*	*3*	*1*	*1*	*1*	*1,0*	*1,7*	*1,3*	*1,3*	*Low*	*Ensure that dust suppressants are applied to gravel or unpaved roads that are in use;* *Vehicles will obey speed limits.*	*2*	*1*	*1*	*1*	*0,8*	*1,3*	*1,2*	*0,9*	*Very low*
		Visual and Topography Environment.	*Topographical change* *Negative visual impact caused by drilling*	*2*	*1*	*1*	*1*	*0,8*	*1,3*	*1,2*	*0,9*	*Very low*	*Ensure liaison with the local authorities for the maintenance and upkeep of roads;* *Ensure that dust suppressants are applied to gravel or unpaved roads that are in use; and* *Vehicles will obey speed limits.*	*2*	*1*	*1*	*1*	*0,6*	*1,3*	*3,0*	*1,8*	*Very low*

		Surface and ground water		*2*	*5*	*4*	*1*	*0, 8*	*3, 7*	*2, 3*	*1, 9*	*Low*	*All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated;* *Spillage control kits will be readily available on site to contain the mobilisation of contaminants and clean up spills;* *All vehicles and machinery to be serviced in a hard park area or at an off-site location;* *Storage of hydrocarbons and explosives must be managed according to the Hazardous Substances Act, 1973 (Act No. 15 of 1973);* *Hydrocarbons and explosives storage facilities must be in a hard park bunded facility; and*	*2*	*5*	*5*	*2*	*0, 6*	*4, 0*	*3, 0*	*1, 8*	*Low*

												Vehicles with leaks must have drip trays in place.									
		Maize Crop	*Clearance of maize where borehole is to be drilled*	*3*	*1*	*1*	*1*	*1, 0*	*1, 7*	*1, 3*	*1, 3*	*Low*	*Drilling will only occur after harvest. No crops will be removed. Drilling will occur during the dry seasons. Area will be rehabilitated immediately to prepare for planting of seeds*	*2*	*1*	*1*	*1*	*1, 0*	*1, 3*	*0, 8*	*0, 8*	*Very low*

		Soil	Soil compaction.	3	1	1	1	0,8	1,7	1,3	1,1	Low	If possible, vegetation clearance can be scheduled to coincide with low rainfall conditions when soil moisture is anticipated to be relatively low such that the soils are less prone to compaction(during dry seasons) The movement of heavy vehicle (drill rig) should be limited to existing roads.	2	1	1	1	0,8	1,3	1,2	0,9	Very low

		Livestock	*Movement of machinery near livestock*	*3*	*1*	*1*	*1*	*0.8*	*1.7*	*1.3*	*1.1*	*Low*	*Ensure that speed limit is kept, and dust is suppressed. No movement within the buffered area of where livestock is to be temporarily placed during prospecting activities*	*2*	*1*	*1*	*1*	*0.8*	*1.3*	*1.2*	*0.9*	*Very low*

3.	*Use and storage of fuel and lubricants.*	*Soil*	*Soil contamination and degradation.*	*3*	*1*	*1*	*1*	*0,8*	*1,7*	*1,3*	*1,1*	*Low*	*All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated;* *Spillage control kits will be readily available on site to contain the mobilisation of contaminants and clean up spills;* *All vehicles and machinery to be serviced in a hard park area or at an off-site location;* *Storage of hydrocarbons must be managed according to the Hazardous Substances Act, 1973 (Act No. 15 of 1973); and* *Vehicles with leaks must have drip trays in place.*	*2*	*5*	*5*	*2*	*0,6*	*4,0*	*3,0*	*1,8*	*Low*

		Surface Water	*Impacts on surface water resources as a result of hydrocarbon spills.*	*3*	*3*	*1*	*2*	*0,6*	*2,3*	*2,2*	*1,3*	*Low*	*In case whereby contractors bring on site mobile bowsers and lubricants, these are to be stored in a bunded area when parked at the construction areas;All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated;Spillage control kits will be readily available on site to contain the mobilisation of contaminants and clean up spills;All vehicles and machinery to be serviced in a hard park area or at an off-site location;Storage of hydrocarbons must be managed according to the Hazardous Substances Act, 1973 (Act No. 15 of 1973); andVehicles with leaks must have drip trays in place.*	*2*	*3*	*1*	*1*	*0,4*	*2,0*	*1,5*	*0,6*	*Very low*

		Groundwater	Groundwater contamination	4	3	1	2	0,6	2,7	2,3	1,4	Low	In case whereby contractors bring on site mobile bowsers and lubricants, these are to be stored in a bunded area when parked at the construction areas; All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated; Spillage control kits will be readily available on site to contain the mobilisation of contaminants and clean up spills; All vehicles and machinery to be serviced in a hard park area or at an off-site location; Storage of hydrocarbons must be managed according to the Hazardous Substances Act, 1973 (Act No. 15 of	2	2	1	1	0,4	1,7	1,3	0,5	Very low

													1973); and Vehicles with leaks must have drip trays in place.									
4,0	4. Site clearance as a result of the preparations for temporary surface infrastructure.	Air Quality	Dust generation emanating from the activities associated with prospecting	4	4	1	3	1,0	3,0	3,0	3,0	Moderate	The area of disturbance must be restricted to the required footprint size; Ensure that only vegetation within the designated areas is removed; Gravel roads to be wetted by a water browser and/or any	3	3	1	2	0,8	2,3	2,2	1,7	Low

												applicable dust suppressant so as to reduce dust plumes.									
		Topography and Visual Environment	*Disturbance of scenery due to site and machinery*	*3*	*1*	*1*	*1*	*1,0*	*1,7*	*1,3*	*1,3*	*Low*	*Machinery and site set up will only be present during the specified, communicated and agreed upon timeframe.*	*2*	*1*	*1*	*1*	*1,0*	*1,3*	*1,2*	*1,2*	*Low*
			Soil erosion and generation of dust.	*3*	*3*	*1*	*2*	*0,8*	*2,3*	*2,2*	*1,7*	*Low*	*Dust can be mitigated by suppressants so that the construction phase does not produce bursts of dusts*	*3*	*2*	*1*	*2*	*0,6*	*2,0*	*2,0*	*1,2*	*Low*
			Soil compaction.	*3*	*3*	*1*	*1*	*0,8*	*2,3*	*1,7*	*1,3*	*Low*	*If possible, vegetation clearance and commencement of related activities (construction of haul road), can be scheduled to coincide with low rainfall conditions when soil moisture is anticipated to be relatively low such that the soils are less*	*2*	*2*	*1*	*1*	*0,8*	*1,7*	*1,3*	*1,1*	Low

												prone to compaction; *The movement of heavy vehicle should be limited to existing roads*									
			Loss of land capability and land use potential	*2*	*1*	*1*	*1*	*0, 8*	*1, 3*	*1, 2*	*0, 9*	*Very low*	*• Any compacted soils must be ripped to alleviate compaction;* *• The footprint should be re-vegetated with the relevant seed mixture as soon as possible*	*2*	*1*	*1*	*1*	*0, 6*	*1, 3*	*1, 2*	*0, 7*	*Very low*

			Loss of vegetation communities.	*2*	*1*	*1*	*1*	*0,6*	*1,3*	*1,2*	*0,7*	*Very low*	*• Ensure site clearing is restricted to the footprint of the designated areas to limit the degradation and destruction of the cultivated land• All activities are to occur after harvest so as to not disturb production of maize*	*2*	*1*	*1*	*1*	*0,4*	*1,3*	*1,2*	*0,5*	*Very low*

			The destruction or degradation of watercourse vegetation.	*2*	*5*	*5*	*2*	*0,6*	*4,0*	*3,0*	*1,8*	*Low*	• *Ensure the flow of water through the moist grassland areas remain unchanged.* • *Monitor the presence of hydrophytes and species with an affinity for moist soils within the moist grasslands. Should such species decrease of be replaced by terrestrial species, then it is likely that the hydrological regime on the site has changed.* • *If moist grasslands are found to become drier, the Crinum species must be relocated to suitable habitat.* • *Input of sediment due to any related mining activities should be prevented at all cost.* • *Pollution of the surface and groundwater. Mitigation for this potential impact includes:* *o In the case of pollution of any surface or groundwater, the Regional Representative*	*2*	*4*	*4*	*1*	*0,6*	*3,3*	*2,2*	*1,3*	*Low*

													of the Department of Water Affairs must be informed immediately; *o Store all litter carefully so it cannot be washed or blown into the water course;* *o Storage of potentially hazardous materials should be above any 100-year flood line or the functional wetland boundary (and its associated buffer zone). These materials include fuel, oil, cement, bitumen etc.;* *o Surface water draining off contaminated areas containing oil and petrol would need to be channeled towards a sump which will separate these chemicals and oils;* *o No uncontrolled discharges of water from the mine to any surface water resources shall be permitted. Any discharge points need to*									

													be approved by the relevant authority.									

			Destruction of Maize filed.	*3*	*2*	*1*	*1*	*1,0*	*2,0*	*1,5*	*1,5*	*Low*	*The contractors setting up should use the EMPR to oversee construction activities and ensure the following:• Keep the development footprint in Medium categories as small as possible.• A temporary fence or demarcation must be erected around the construction area (include the actual footprint, as well as areas where material is stored) to prevent access to adjacent sensitive vegetation.• Maintain site demarcations in position until the cessation of construction work.• Only remove vegetation where necessary and retain vegetation in place for as long as possible prior to removal.• Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area.• Formalize access*	*2*	*4*	*4*	*1*	*0,6*	*3,3*	*2,2*	*1,3*	*Low*

													roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.• Implement a vegetation rehabilitation plan to ensure areas that can be rehabilitated post construction are adequately vegetated with indigenous grass species.• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.								

			Erosion and subsequent sedimentation or pollution of proximate moist grassland (watercourse).	*3*	*3*	*1*	*1*	*0,8*	*2,3*	*1,7*	*1,3*	*Low*	*• Make use of existing roads and tracks where feasible, rather than creating new routes through cultivated areas..• Do not remove any vegetation unnecessarily and only remove as per the specified extent.• Runoff from access roads must be managed to avoid erosion and pollution problems.• Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.• Prevent spillage of construction material, oils or other chemicals, strictly prohibit other pollution. Ensure there is a method statement in place to remedy any accidental spillages immediately.• After construction clear any temporarily impacted areas of all*	*3*	*2*	*1*	*1*	*0,6*	*2,0*	*1,5*	*0,9*	*Very low*

													foreign materials, re-apply and/or loosen topsoil's and landscape to surrounding level.								
		Surface and ground water	*Siltation of surface water resources.*	*3*	*2*	*1*	*2*	*0, 8*	*2, 0*	*2, 0*	*1, 6*	*Low*	*• Ensure site clearing is limited to the designated areas*	*2*	*1*	*1*	*1*	*0, 6*	*1, 3*	*1, 2*	*0, 7*	*Very low*

			Contamination of water resources	*3*	*2*	*1*	*2*	*0,8*	*2,0*	*2,0*	*1,6*	*Low*	• *Ensure that no infrastructure, containers or machinery is leaking during the construction phase.* • *Groundwater monitoring of the water quality and levels must take place. A tray or cover must be in place for objects with hazardous substances to avoid any possible leaks/spillage.*	*2*	*1*	*1*	*1*	*0,8*	*1,3*	*1,2*	*0,9*	*Very low*
		Noise	*Noise emanating from the construction of the site and vehicles impacting on surrounding sensitive receptors.*	*3*	*2*	*1*	*2*	*0,6*	*2,0*	*2,0*	*1,2*	*Low*	• *Ensure site clearing activities are only undertaken during daylight hours;* • *Ensure equipment and machinery is switched off when not in use.*	*2*	*2*	*1*	*2*	*0,6*	*1,7*	*1,8*	*1,1*	*Low*

		Livestock	*Dust generation*	*3*	*1*	*1*	*1*	*0.8*	*1.7*	*1.3*	*1.1*	*Low*	*Ensure that infrastructure is set up a measurable distance from the livestock and ensure that the time of operation is agreed upon by the landowner/farmers.*	*2*	*1*	*1*	*1*	*0.8*	*1.3*	*1.2*	*0.9*	*Very low*

5,0	*Storage, use and control of fuel and lubricants to be used for the drilling activities.*	*Soil*	*Soil contamination and degradation*	*4*	*4*	*1*	*1*	*0,8*	*3,0*	*2,0*	*1,6*	*Low*	*• All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated;• Spillage control kits will be readily available on site to contain the mobilisation of contaminants and clean up spills;• All vehicles and machinery to be serviced in a hard park area or at an off-site location;• Storage of hydrocarbons must be managed according to the Hazardous Substances Act, 1973 (Act No. 15 of 1973); • Hydrocarbons storage facilities must be in a hard park bunded facility; and• Vehicles with leaks must have drip trays in place.*	*2*	*4*	*1*	*1*	*0,6*	*2,3*	*1,7*	*1,0*	*Low*

		Groundwater	Groundwater contamination	5	3	1	2	1,0	3,0	2,5	2,5	Moderate	• All potential hydrocarbon leaks must be repaired immediately and spillages be cleaned up immediately and the soils remediated; • Spillage control kits will be readily available on site to contain the mobilisation of contaminants and clean up spills; • All vehicles and machinery to be serviced in a hard park area or at an off-site location; • Storage of hydrocarbons and explosives must be managed according to the Hazardous Substances Act, 1973 (Act No. 15 of 1973); • Hydrocarbons and explosives storage facilities must be in a hard park bunded facility; and • Vehicles with leaks must have drip trays in place; and	4	2	1	1	0,8	2,3	1,7	1,3	Low

													• Groundwater monitoring of the water quality and levels must take place quarterly especially for the water supply boreholes to ensure a sustainable resource and identify impacts on local users.									
6,0	Vehicular activity.	Air Quality	Fugitive dust generation emanating.	3	3	1	2	0,8	2,3	2,2	1,7	Low	• Ensure the area of disturbance during the prospecting activities is restricted to the extent of the drilling area • Ensure that dust suppressants are applied to gravel or unpaved roads that are in use; • Vehicles will obey speed limits. Maintenance equipment and heavy vehicle speeds should be reduced, where possible, to prevent dust emissions.	2	3	1	2	0,6	2,0	2,0	1,2	Low

		Visual and Topography Environment	Topography change and disruption of surface water flow	3	2	1	2	0,8	2,0	2,0	1,6	Low	• Ensure that existing access roads are used as much as possible. • Ensure that dust suppressants are applied to gravel or unpaved roads that are in use; and • Vehicles will obey speed limits.	2	2	1	1	0,6	1,7	1,3	0,8	Very low
		Soil	Soil contamination and degradation.	3	3	1	2	1,0	2,3	2,2	2,2	Moderate	• All potential hydrocarbon spillages and leaks must be cleaned up immediately and the soils remediated;• Spillage control kits will be readily available on site to contain the mobilisation of contaminants and clean up spills;• All vehicles and machinery to be serviced in a hard park area or at an off-site location;• Storage of hydrocarbons and explosives must be managed according to the Hazardous Substances Act, 1973 (Act No. 15 of 1973); •	2	3	1	2	0,8	2,0	2,0	1,6	Low

													Hydrocarbons and explosives storage facilities must be in a hard park bunded facility; and• Vehicles with leaks must have drip trays in place.									
		Fauna and Flora	*Loss of biodiversity and minimise impacts on floral species*	*3*	*2*	*1*	*2*	*0, 8*	*2, 0*	*2, 0*	*1, 6*	*Low*	• *Ensure that dust suppressants are applied to gravel or unpaved roads that are in use;* • *Vehicles will obey speed limits.*	*2*	*2*	*1*	*2*	*0, 6*	*1, 7*	*1, 8*	*1, 1*	*Low*

		Wetlands and Aquatic Ecology	*Contamination and sedimentation of the wetland systems and aquatic ecosystems*	*2*	*2*	*1*	*2*	*1,0*	*1,7*	*1,8*	*1,8*	*Low*	*• Ensure a Storm Water Management Plan is implemented; • Ensure that dust suppressants are applied to gravel or unpaved roads that are in use and exposed surfaces; • Cover the road going trucks from the tip to KPS with a tarpaulin to prevent coal dust generation; • Vehicles will obey speed limits; and • Implement a biannual Aquatic Monitoring Programme to monitor potential impacts and implement corrective actions, should it be required.*	*2*	*1*	*1*	*2*	*0,6*	*1,3*	*1,7*	*1,0*	*Low*
		Surface Water	*Contamination and sedimentation of clean water resources.*	*3*	*2*	*1*	*2*	*0,8*	*2,0*	*2,0*	*1,6*	*Low*	*• Ensure that dust suppressants are applied to gravel or unpaved roads that are in use and exposed surfaces; • Vehicles will obey speed limits; and • Monitor surface water resources arounhd*	*2*	*1*	*1*	*1*	*0,6*	*1,3*	*1,2*	*0,7*	*Very low*

													project area to identify potential contamination.								
		Noise	*noise emanating from mining and vehicular activities impacting on surrounding sensitive receptors.*	*4*	*4*	*1*	*2*	*1,0*	*3,0*	*2,5*	*2,5*	*Moderate*	• *Prospecting related machines and vehicles should be serviced prior to commencement of activities and should there be an issue the equipment must be serviced immediately to avoid further generation of noise outside that of the drilling* • *Ensure equipment and machinery is switched off when not in use.* • *Adhere to the set speed limit in accordance to the Management Plan.*	*2*	*4*	*4*	*1*	*0,8*	*3,3*	*2,2*	*1,7*	*Low*

		Traffic	Degradation of the road structures resulting in potential health and safety risks and soil erosion.	3	2	1	2	0,8	2,0	2,0	1,6	Low	• existing roads must be used as much as possible. Road use should remain in the working hours stipulated in the management programme. • Adhere to the set speed limit in accordance to the Management Plan.	2	2	1	2	0,4	1,7	1,8	0,7	Very low
7,0	Waste and sewage generation and disposal.	Visual and Topography Environment	Topography change	2	3	1	2	0,8	2,0	2,0	1,6	Low	• Waste must be stored away from surface water and drainage lines; and • General and hazardous waste must be removed and disposed of frequently at a registered disposal site.	2	2	1	1	0,6	1,7	1,3	0,8	Very low

		soil	Degradation and contamination of soil	4	3	1	2	0,8	2,7	2,3	1,9	Low	• Burying of any waste including domestic waste, empty containers on the site must be strictly prohibited; • Proper waste storage facilities should be available and used for the correct separation and storage of waste prior to collection and disposal; and • Generated waste must be removed to an approved disposal facility.	3	2	1	1	0,4	2,0	1,5	0,6	Very low
		Surface Water	Contamination of clean water resources.	4	3	1	2	1,0	2,7	2,3	2,3	Moderate	• The sewer waster collected from the workings must be disposed of at a licensed sewage treatment facility; • Monitor surface water resources up and downstream of the Project area to identify potential contamination; • Remove core log after analysis • Waste must be	3	2	1	2	0,6	2,0	2,0	1,2	Low

													separated at source and stored in appropriately designated areas for disposal at a licensed facility or by a reputable contractor.								

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

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

Assigning significance to potential impacts requires integration of the severity (magnitude of the potential impacts), type of the impact, extent to which the impact will occur, probability of the impact (the likelihood of the impact occurring) and the duration of the impact. This is the best way to determine whether the impact is important or not, once the mitigation is considered.

Impacts have been assigned a rating of high (H), medium/moderate (M), low (L), very low (VL) or no impact. A significance rating is assigned twice to the impact. Firstly, to indicate significance without mitigation or optimization and secondly, to indicate significance after mitigation or optimisation. This is done to highlight the importance of mitigation or optimisation of potential impacts.

Table 14: Impact Severity rating

Category	Description/definition
High	Impacts will be of high significance if one of the following applies: • The extent is national to international • The duration is long term to permanent • The severity will be high • Probability is definite
Moderate	Impacts will be of moderate significance if one of the following applies: • The extent is local to regional • The duration is medium to long term • The severity is major • The probability is highly probable

Low	Impacts will be of low significance if one of the following applies: • The extent is local • The duration is temporary to permanent • The severity is low • The probability is probable
Very low	Impacts will be of very low significance if one of the following applies: • The extent is site-specific • The duration is temporary to permanent • The severity is very low • The probability is improbable
No impacts	A potential concern of impact which, upon evaluation, is found to have no impact.

This section provides a description of the methodology that was applied to assess the significance of environmental and heritage impacts. The significance rating process follows the established impact/risk assessment formula:

- Significance = Consequence x Probability, WHERE.
- Consequence = Severity + Spatial Scale +Duration, AND
- Probability = Likelihood of an impact occurring

The matrix calculates the rating out of 75 then converts this to a percentage. The percentage is the figure quoted in the matrix. The weight assigned to the various parameters for positive and negative impacts is presented in Table 15.

Table 15: Impact severity

Rating	Severity		Spatial scale	Duration	Probability
	Environmental	Social/cultural heritage			
7	Very significant impact on the environment. Irreparable damage to highly valued species, habitat or ecosystem. Persistent severe damage.	Irreparable damage to highly valued items of great cultural significance or complete breakdown of social order.	International	Permanent to mitigation	Certain/ definite
6	Significant impact on highly valued species, habitat or ecosystem.	Irreparable damage to highly valued items of cultural significance or breakdown of social order.	National	Permanent mitigated	Almost certain/ high probability
5	Very serious, long- term environmental impairment of ecosystem function that may take several years to rehabilitate.	Very serious widespread social impacts. Irreparable damage to highly valued items.	Province/ region	Project life (The impact will cease after the operational life span of the project)	Likely
4	Serious medium term environmental effects. Environmental damage can be reversed in less than a year.	On-going serious socia issues. Significan damage to structures, items of cultura significance	Municipal area	Long term (6-15 years)	Probable
3	Moderate, short-term effects but not affecting ecosystem function. Rehabilitation requires intervention of external specialists and can be done in less than a month.	On-going social issues. Damage to items of cultural significance.	Local	Medium term (1-5 years)	Unlikely/ low probability

Rating	Severity		Spatial scale	Duration	Probability
	Environmental	Social/cultural heritage			
2	Minor effects on biological or physical environment. Environmental damage can be rehabilitated internally with/ without help of external consultants.	Minor medium-term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Limited	Short term (Less than 1 year)	Rare/ improbable
1	Limited damage to minimal area of low significance, (e.g., ad hoc spills within plant area). Will have no impact on the environment	Low-level repairable damage to commonplace structures	Very limited	Immediate (Less than 1 month)	Highly unlikely/ none

Table 16: Impact significance.

Probability/Likelihood	Consequence (severity + scale + duration)								
	1	3	5	7	9	11	15	18	21
1	1	3	5	7	9	11	15	18	21
2	2	6	10	14	18	22	30	36	42
3	3	9	15	21	27	33	45	54	63
4	4	12	20	28	36	44	60	72	84
5	5	15	25	35	45	55	75	90	105
6	6	18	30	42	54	66	90	108	126
7	7	21	35	49	63	77	105	126	147

Table 17: Impact significance threshold limit

Significance		
Low	**0 - 35**	
Medium-Low	**36 - 76**	
High-Medium	**73 - 107**	
High	**108 - 147**	

Activity 1: Construction phase

Impacted environment: Topography, visual, soil, land capability, surface water, groundwater, air quality, natural vegetation, animal life and noise

Description: This activity involves bringing equipment to site as well as establishing structures associated with drilling prior to actual drilling. The significance of the impacts of the construction, operating and decommissioning of the prospecting area on the environment is low. There is a potential for most of the environment to be impacted over a limited spatial extent. Mitigation measures need to be applied to reduce or prevent the physical impacts on the affected environment.

Table 18: Impact of construction on project area.

Phase impact occurs (C, O, D)	Affected environment	Nature of Impact (Negative/Positive)	Spatial Scale (7)	Duration (7)	Severity (7)	Consequence	Probability (7)	Significance (147)	Significance rating (pre-mitigation)
C,O,D	Soil	N	2	6	4	12	5	60	Medium-Low
C,O,D	Land capability	N	2	6	4	12	5	60	Medium-Low
C,O,D	Surface water	N	4	5	5	14	4	56	Medium-Low
C,O,D	Ground water	N	4	5	5	14	4	56	Medium-Low
C,O,D	Natural vegetation	N	2	5	4	11	5	55	Medium-Low
C,O,D	Animal life	N	2	4	6	12	4	48	Medium-Low

Activity 2: Storage of hydrocarbons, chemicals, fuel

Impacted environment: Soil, land capability, surface water, groundwater and natural vegetation.

Description: This activity involves the storage of hydrocarbons, chemicals and fuel in the project area. During the drilling activities there will be no storage of diesel fuel, oil and lubricants on site. Significant amount of diesel will be transported to site for the drill rig machine on a daily basis for the duration of the prospecting activities. The potential contaminants for the prospecting of the applied for minerals can be controlled easily as this activity will only take place for a short period of time. Fuel and oil handling facilities are likely sources of hydrocarbon related contaminants. Oils, grease, and other hydrocarbon products (such as petrol and diesel) handled in these areas may contaminate the environment by spillages and leakages (e.g., from drill rigs).

Absorbent Spill kits will be made available near the drill rigs during drilling activities; The oil absorbent chemicals will ensure that no oils infiltrate down to the underground to cause any groundwater contamination.

Table 19: Impact of hydrocarbon, chemical and fuel storage.

Phase impact occurs (C, O, D)	Affected environment	Nature of Impact (Negative/Positive)	Spatial Scale (7)	Duration (7)	Severity (7)	Consequence	Probability (7)	Significance (147)	Significance rating (pre-mitigation)
C,O,D	Soil	N	2	5	3	10	5	50	Medium-Low
C,O,D	Land capability	N	2	5	3	10	5	50	Medium-Low
C,O,D	Surface water	N	4	5	5	14	5	56	Medium-Low
C,O,D	Ground water	N	4	5	5	14	5	56	Medium-Low
C,O,D	Natural vegetation	N	2	5	3	10	5	50	Medium-Low
C,O,D	Animal life	N	2	4	6	12	4	48	Medium-Low

Activity 3: Temporal fence

Impacted environment: Visual and animal life

Description: This involves the placement of a fence on the farm. The significance of the impacts of the activity on the affected environment are potentially medium-low, with high probabilities of occurrence. The impact that the fence will have on animal life is potentially positive as animals like livestock will be restricted from grazing in the project area, preventing injury and possible overgrazing. Mitigation measures need to be applied to reduce or prevent physical impacts on the environment.

Table 20: Impact of temporal fence.

Phase impact occurs (C, O, D)	Affected environment	Nature of Impact (Negative/Positive)	Spatial Scale (7)	Duration (7)	Severity (7)	Consequence	Probability (7)	Significance (147)	Significance rating (pre-mitigation)
C,O,D	Visual	N	2	4	3	9	5	45	Medium-Low
C,O,D	Animal life	P	2	3	3	8	4	32	Low

Activity 4: Removal and storage of topsoil (topsoil stockpile)

Impacted environment: Soil, land capability, visual, topography, surface water, air quality, natural vegetation, animal life and noise.

Description: This activity will cause surface disturbance. The significance of the impacts of the activity on the affected environment are potentially medium-low, with high probabilities of occurrence. Most of the environment will be potentially impacted over a limited spatial extent with visual and noise disturbance occurring locally. Surface water and archaeology & cultural heritage is most likely to occur on a municipal scale. Mitigation measures need to be applied to reduce or prevent physical impacts on the environment.

Table 21: Impact of topsoil removal and storage.

Phase impact occurs (C, O, D)	Affected environment	Nature of Impact (Negative/Positive)	Spatial Scale (7)	Duration (7)	Severity (7)	Consequence	Probability (7)	Significance (147)	Significance rating (pre-mitigation)
C,D	Soil	N	2	5	4	11	5	55	Medium-Low
C,O,D	Land capability	N	2	6	4	12	5	60	Medium-Low
C,D	Visual	N	3	4	3	10	5	50	Medium-Low
C,O,D	Topography	N	2	5	3	10	6	60	Medium-Low
C,O,D	Surface water	N	4	5	5	14	4	56	Medium-Low
C,O,D	Air quality	N	2	3	4	9	5	45	Medium-Low
C,O,D	Natural vegetation	N	2	6	4	12	5	60	Medium-Low
C,O,D	Animal life	N	2	4	6	12	4	48	Medium-Low
C,O,D	Cultural heritage/ archaeology	N	4	5	5	14	5	70	Medium-Low
C,O,D	Noise	N	3	2	3	8	6	48	Medium-Low

Activity 5: Transport of equipment

Impacted environment: Soil, land capability, surface water, groundwater, air quality, natural vegetation, animal life, archaeology/cultural heritage and noise.

Description: The significance of the impacts of the activity on the affected environment are potentially medium-low, with high probabilities of occurrence. Most of the environment will be potentially impacted over a limited spatial extent with noise potentially occurring over a local extent. Mitigation measures need to be applied to reduce or prevent physical impacts on the environment.

Table 22: Impact of equipment transport.

Phase impact occurs (C, O, D)	Affected environment	Nature of Impact (Negative/Positive)	Spatial Scale (7)	Duration (7)	Severity (7)	Consequence	Probability (7)	Significance (147)	Significance rating (pre-mitigation)
C,O,D	Soil	N	2	6	4	12	5	60	Medium-Low
C,O,D	Land capability	N	2	6	4	12	5	60	Medium-Low
C,O,D	Surface water	N	4	5	5	14	4	56	Medium-Low
C,O,D	Ground water	N	4	5	5	14	4	56	Medium-Low
C,O,D	Air quality	N	2	3	4	9	5	45	Medium-Low
C,O,D	Natural vegetation	N	2	5	4	11	5	55	Medium-Low
C,O,D	Animal life	N	2	4	6	12	4	48	Medium-Low
C,O,D	Cultural heritage/ archaeology	N	4	5	5	14	5	70	Medium-Low
C,O,D	Noise	N	3	2	3	8	6	48	Medium-Low

Activity 6: Ablutions

Impacted environment: Soil, land capability, surface water and groundwater

Description: The significance of the impacts of the activity on the affected environment are potentially medium-low, with high probabilities of occurrence. Most of the environment will be potentially impacted over a limited spatial extent, except for surface and groundwater which is most likely to occur over a limited extent. Mitigation measures need to be applied to reduce or prevent physical impacts on the environment.

Table 23: Impact of ablutions.

Phase impact occurs (C, O, D)	Affected environment	Nature of Impact (Negative/Positive)	Spatial Scale (7)	Duration (7)	Severity (7)	Consequence	Probability (7)	Significance (147)	Significance rating (pre-mitigation)
C,O,D	Soil	N	2	6	4	12	5	60	Medium-Low
C,O,D	Land capability	N	2	6	4	12	5	60	Medium-Low
C,O,D	Surface water	N	4	5	5	14	4	56	Medium-Low
C,O,D	Ground water	N	4	5	5	14	4	56	Medium-Low

Activity 7: Domestic waste

Impacted environment: Soil, visual, land capability, surface water, groundwater, natural vegetation and animal life.

Description: The significance of the impacts of the activity on the affected environment are potentially medium-low, with high probabilities of occurrence. Most of the environment will be potentially impacted over a limited spatial extent, except for surface and groundwater which is most likely to occur on a limited spatial extent. Mitigation measures need to be applied to reduce or prevent physical impacts on the environment.

Table 24: Impact of domestic waste.

Phase impact occurs (C, O, D)	Affected environment	Nature of Impact (Negative/Positive)	Spatial Scale (7)	Duration (7)	Severity (7)	Consequence	Probability (7)	Significance (147)	Significance rating (pre-mitigation)
C,O,D	Soil	N	2	6	4	12	5	60	Medium-Low
C,O,D	Visual	N	2	4	4	10	5	50	Medium-Low
C,O,D	Land capability	N	2	6	4	12	5	60	Medium-Low
C,O,D	Surface water	N	4	5	5	14	4	56	Medium-Low
C,O,D	Groundwater	N	4	5	5	14	4	56	Medium-Low
C,O,D	Natural vegetation	N	2	6	4	12	5	60	Medium-Low
C,O,D	Animal life	N	2	4	6	12	4	48	Medium-Low

Activity 8: Access roads

Impacted environment: Soil, land capability, surface water, air quality, natural vegetation, animal life, wetlands, archaeology/cultural heritage and noise.

Description: The significance of the impacts of the activity on the affected environment are potentially medium-low, with high probabilities of occurrence. Most of the environment will be potentially impacted over a limited spatial extent, except for noise which probably occur on a local scale and surface and groundwater as well as archaeology/cultural heritage which will occur on a municipal extent. Mitigation measures need to be applied to reduce or prevent physical impacts on the environment.

Table 25: Impact of access roads.

Phase impact occurs (C, O, D)	Affected environment	Nature of Impact (Negative/Positive)	Spatial Scale (7)	Duration (7)	Severity (7)	Consequence	Probability (7)	Significance (147)	Significance rating (pre-mitigation)
C,O,D	Soil	N	2	6	4	12	5	60	Medium-Low
C,O,D	Land capability	N	2	6	4	12	5	60	Medium-Low
C,O,D	Surface water	N	4	5	5	14	4	56	Medium-Low
C,O,D	Ground water	N	4	5	5	14	4	56	Medium-Low
C,O,D	Air quality	N	2	3	4	9	5	45	Medium-Low
C,O,D	Natural vegetation	N	2	6	4	12	5	60	Medium-Low
C,O,D	Animal life	N	2	4	6	12	4	48	Medium-Low
C,O,D	Cultural heritage/ archaeology	N	4	5	5	14	5	70	Medium-Low
C,O,D	Noise	N	3	2	3	8	6	48	Medium-Low

Soils, land capability and land use

Prospecting activities involve drilling but may affect land available for grazing and will increase the potential for soil erosion (which is currently minimal). Fencing off the project area will prevent animals from grazing, thus improving vegetation growth in the area. Soil pollution from domestic waste and hydrocarbon spillages may occur, potentially increasing soil contamination. Soils that have been stripped can never be replaced in their original state due to the alteration of physical, chemical and biological soil properties during removal and stockpiling. Stockpiling influences soil properties negatively and may cause soil deterioration, especially in terms of biological quality. The cumulative impact on regional land capability and land use is low due to the land use being predominately for agriculture which is dominated by grazing and housing. Thus, the activities will result in a low significance cumulative impact only being limited to the site and its immediate surroundings.

Surface water

There are non-perennial and perennial rivers traversing the project area. Considerable care must be taken to ensure that these water courses are not disturbed and contaminated by the proposed activities.

Groundwater

Hydrocarbon spills from trucks and machinery, ablutions and domestic waste may contribute to groundwater contamination. The total cumulative impact is low as these activities will be limited to the site.

Noise

Cumulative impacts are expected to be significant due to drilling machines and trucks. Surrounding farmers will also contribute to noise levels in the area with agricultural activities. Prospecting operations will take place between 07:00 and 17:30 to limit noise to office hours. The total cumulative impacts are expected to be low-medium.

Flora

The natural flora of the surrounding areas is rarely disturbed due to lack of mining activities. It is, however, disturbed by livestock grazing. Vegetation destruction will only occur during the construction phase in a potentially disturbed area. The cumulative impacts will be more severe if endemic and Red Data plants are encountered on site, but mitigation measures, like the protection and removal of Red Data plants and the rehabilitation and re-introduction of animals currently present after closure should reduce the significance of the negative cumulative impact.

Fauna

Regionally, agriculture, plantations, sheep and Livestock farming take place. Towns and communities are developing, resulting in a less significant cumulative impact on the fauna. The cumulative impacts will be more severe if endemic and Red Data animals occur in the area, but mitigation measures, like the protection and removal of Red Data animals and the rehabilitation and re-introduction of animals currently present after closure should reduce the significance of the negative cumulative impact.

Visual aspects

Drilling will have a slight impact on the visual aspects. There are, however, already existing impacts on the visual aspects of the area due to the agricultural activities and presence of other infrastructure. The cumulative impacts can be summarised in

Table 26.

Table 26: Impact of visual aspects.

Impacted environment	Nature of Impact (Negative/Positive)	Spatial Scale (7)	Duration (7)	Severity (7)	Consequence	Probability (7)	Significance (147)
Geology	N	1	3	1	5	2	10
Soils, land capability and land use	N	3	4	3	10	5	50
Surface water	N	3	3	2	8	4	32
Groundwater	N	3	3	2	8	4	32
Air quality	N	2	3	2	7	4	28
Noise	N	2	2	2	6	4	24
Flora	N	1	3	2	6	4	24
Fauna	N	1	3	2	6	4	24
Site of archaeological and cultural interest	N	2	3	2	7	4	28
Visual impacts	N	1	3	2	6	4	24

18 POSITIVE AND NEGATIVE IMPACTS OF THE PROPOSED ACTIVITY (IN TERMS OF THE INITIAL SITE LAYOUT) AND ALTERNATIVES ON THE ENVIRONMENT AND COMMUNITY

Potential impacts that were identified during the Basic Assessment Process are discussed under environmental component headings in this section. The project will not cause adverse surface disturbances as the planned prospecting activities will be managed and rehabilitation will occur progressively per drill hole. A 100m buffer zone will be established around all rivers and water features.

Advantages & Disadvantages

The geology of the area is largely characterised by Klipwal formation which is known to host the minerals sought for. Since the area is presumed to not being prospected on, it is an added advantage for this project.

There are no known disadvantages of the selected site in terms of the mineral to be prospected for or the location and environmental issues/concerns (Except for the fact that the topology of might pose accessibility challenges for the drill rig in some instances). No alternative site is considered as the application area has the potential to host the minerals sought for.

19 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).

This section contains guidelines, operating procedures and rehabilitation/pollution control requirements which will be binding on the holder of the prospecting right after approval of the Environmental Management Programme. It is essential that this portion be carefully studied, understood, implemented, and adhered to at all times.

The applicant shall ensure that this Environmental Management Programme is provided to the Project Manager and any other person or organisation who may work on the site. Ulibo Resources (Pty) Ltd development shall ensure that any person or organisation that works on the site complies with the requirements of this Environmental Management Programme Report.

19.1 Measures to manage the potential impact on heritage resources

The only visible possible heritage resources that are visible are graves of members within the community. Due to the fact that the settlement is informal graves are scattered within the homesteads. These homesteads have already been buffered thus the graves are included in the buffered area. No boreholes are proposed within the buffered areas. Upon investigation, borehole position were placed in areas of low sensitivity (open veld, cultivated land etc.)

Should any unknown heritage sites be identified during the drilling activities, all activities will cease immediately and the SAHRA will be contacted and an appropriate Heritage Impact Assessment will be undertaken on the site identified.

19.2 Measures to manage the potential impacts on communities, individuals or competing land uses in close proximity

- **Pollution Prevention**
  - Mitigation and management measures must be implemented to prevent environmental pollution which may impact on environmental resources utilized by communities, landowners, and other stakeholders. These mitigation and management measures are discussed in the following section.
- **Noise due to drilling and prospecting activities.**
  - Directly affected, adjacent landowners and farms in proximity to the site will be informed of the planned drilling and a grievance mechanism will be made available.

- Site activities will be conducted during daytime hours 07h00 – 17h00 to avoid night-time noise disturbances and night-time collisions with fauna.

- **Poor access control resulting in impacts on cattle movement, breeding and grazing practices.**
  - Access control procedures must be agreed on with farm owners and all staff trained on these procedures.
- **Influx of persons (job seekers) to site because of increased activity and the possible resultant increase in opportunistic crime.**
  - Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.
  - The landowners (all private and state landowners) will be notified of unauthorised persons encountered on site.
  - If deemed necessary, the South African Police Service will be informed of unauthorised persons encountered on site.
- **Visual Impact**
  - Based on visual observation, wet dust suppression will be undertaken to manage dust emissions from vehicle movement and other construction activities as and when needed. Depending on the need and quantity of water used for wet suppression, a suitable, low environmental impact chemical suppression alternative must be considered to conserve water resources.
  - The portable ablution facilities, vertical water tanks and any other infrastructure should be acquired with a consideration for colour. Natural earth, green and mat black options which will blend in with the surrounding area must be favoured.
  - A waste management system will be implemented, and sufficient waste bins will be provided for on-site. A fine system will be implemented to further prohibit littering and poor housekeeping practices.

19.3 Measures to manage the potential impact on Water quality and availability

- Potential water and soil pollution impacts resulting from hydrocarbon spills and soil erosion will be mitigated and managed as follows:
  - Existing tracks and roads must be used as far as is practicable to minimize the potential for soil erosion. In instances where access to drill sites are to be established, and if required, raised blade clearing will be undertaken with a view to maintain vegetation cover to limit soil erosion potential.
  - Soil disturbances are to be limited as far as is practicable to minimize the potential for soil erosion.
  - When establishing the drill pad, topsoil including the remaining vegetation, will be stripped and stockpiled up-slope of the pad. The stockpile will be shaped to divert

stormwater around the drill pad to minimise soil erosion of the pad. Stockpiled topsoil will be used during rehabilitation efforts.

- Where practicable topsoil will be stripped to a depth of 10 cm.
- Topsoil will be stockpiles to a maximum height of 1.5 m with a side slope of not more than 1:3.
- Mechanical erosion control methods will be implemented if required. This may include the use of geotextiles to stabilise slopes.
- Where there are water bodies, a buffer zone will be implemented and the area will be deemed a no-go zone, so that drilling does not occur near the water bodies thus leading to water pollution.
- To reduce the potential for water pollution during the drilling activities, a sump will be constructed with a sufficient capacity to receive drill fluids and allow for evaporation.
- The sump will be constructed to divert storm water away and / or around the sump to avoid clean storm water inflow.
- Oils and lubricant will be stored within secondary containment structures.
- Where practicable, vehicle maintenance will be undertaken off -site.
- If vehicle maintenance is undertaken on-site (i.e. such as breakdown maintenance), drip trays and / or UPVC sheets will be used to prevent spills and leaks onto the soil.
- A waste management system will be implemented, and sufficient waste bins will be provided for onsite. A fine system will be implemented to further prohibit littering and poor housekeeping practices.
- Waste separation will be undertaken at source and separate receptacles will be provided (i.e. general waste, recyclables and hazardous waste).
- Receptacles will be closed (i.e. fitted with a lockable lid) to eliminate the possibility of access by animals overnight.
- Wastes will be removed and disposed of at an appropriately licensed landfill (facility disposal licenses will be verified) and recyclables will be taken to a licensed recycling facility.
- Drill holes must be temporarily plugged immediately after drilling is completed and remain plugged until they are permanently plugged below ground to eliminate the risk posed to fauna by open drill holes.
- Drill holes must be permanently capped as soon as is practicable.
- The company will operate on the principle that "prevention is better than cure" and so will institute procedures to reduce the risk of emergencies taking place. These will include ensuring that all contracts specify that the contractor is required to comply

with all the environmental measures specified in this EMPr, environmental awareness training, on-going risk assessment and emergency preparedness.

- All employees shall have the telephone numbers of emergency services, including the local ambulance and firefighting service. All employees must be made aware of procedures to be followed during the environmental awareness training course.

- The company shall ensure that there is basic firefighting equipment available on site at all times. This shall include at least two rubber beaters and at least one fire extinguisher. The company shall advise the relevant authority responsible for fire incidents as soon as one starts and shall not wait until the fire is out of control.

- The company shall ensure that all employees are aware of the procedures to be followed for dealing with hydrocarbon spills. The company shall ensure that the necessary materials and equipment for dealing with hydrocarbon spills and leaks is available on Site at all times.

- The company shall ensure that there is always a supply of absorbent material readily available to absorb/ breakdown and where possible is designed to encapsulate minor hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200 l of hydrocarbon liquid spill. There are a number of different products on the market, which can be used as absorbents and encapsulators of hydrocarbons. The following are examples of these products:

    - ✦ Spill-Sorb
    - ✦ Drizzit
    - ✦ Enretech
    - ✦ Peat Moss

In the event of a significant hydrocarbon spill, the following procedure is required:

- The source of the spillage shall be isolated
- The spillage must be contained using sand berms, sandbags, pre-made booms, sawdust or absorbent materials.
- The area shall be cordoned off, secured and made safe.
- If a serious spill has occurred in a sensitive environment, then the Department of Environmental Affairs and Development Planning: Directorate Pollution & Waste Management must be notified.

Treatment and remediation of spill areas shall be undertaken to the satisfaction of the Project Manager. Remediation may include in-situ bioremediation using appropriate products (e.g. Enretech-1 and / or the removal of the spillage together with the contaminated soil and the disposal at a recognised facility.

20 Motivation where no alternative sites were considered

The proposed prospecting area is targeted as, historically, several minerals are said to exist within the area. Apart for the illegal mining activity Bosveld Mine located a few kilometres away from the project area mines gold. The site is therefore regarded as the preferred site and alternative sites are not considered.

Since exploration is temporary in nature no permanent structures will be constructed, negotiations and agreements will be made with the farm owners to use any existing infrastructure like access roads and their farmhouses.

21 Statement motivating the alternative development location within the overall site

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

The specific locations of intrusive drilling activities will be confirmed during Phase 1 of the Prospecting Work Programme. All infrastructure to be developed will be mobile and temporary. It is recommended that all activities take place away from the waterbodies, ESA 30m buffer to be maintained and there should be no clearing of sensitive vegetation.

Negotiations and agreements will be made with the respective landowners to use any existing infrastructure like access roads. Negative impacts identified above will be mitigated through implementation of the proposed mitigation measures as detailed in the EMPr. Where negative impacts cannot be avoided, rehabilitation will be undertaken.

The impacts of the development alternative are considered of medium to low significance and would be further reduced to low should the implementation of the proposed mitigation measures be done accordingly.

22 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 where 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.)

Approach to the EIA

An Environmental Impact Assessment (EIA) is a good planning tool. It identifies the environmental impacts of a proposed development and assists in ensuring that a project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way.

The Basic Impact Assessment for this project complies with the National Environmental Management Act (1998) (as amended) and the NEMA EIA Regulations (2014) and guidelines of the Department of Environmental Affairs (DEA). The guiding principles of an EIA are listed below.

Guiding principles for an EIA

The EIA must take an open participatory approach throughout. This means that there should be no hidden agendas, no restrictions on the information collected during the process and an open-door policy by the proponent. Technical information must be communicated to stakeholders in a way that is understood by them and that enables them to meaningfully comment on the project.

There should be ongoing consultation with interested and affected parties representing all walks of life. Sufficient time for comment must be allowed. The opportunity for comment should be announced on an on-going basis. There should be opportunities for input by specialists and members of the public. Their contributions and issues should be considered when technical specialist studies are conducted and when decisions are made.

Information gathering

Early in the Basic Assessment process, the Environmental Assessment Practitioner (EAP) identified the information that would be required for the impact assessment and the relevant

data were obtained. In addition, available information about the receiving environment was gathered from reliable sources, interested and affected parties, previous documented studies in the area and previous EIA Reports. The project team visited the site to gain first-hand information and an understanding of the existing operations and the proposed project.

- **Baseline Specialist Assessments**

The following baseline studies have been conducted:

- Hydrogeology study
- Soil study

The findings and recommendations identified by the various specialist studies undertaken, were incorporated into the Basic Impact Assessment.

- **Legislative Framework**

The legal requirements were described and assessed in detail.

- **Alternatives**

Prospecting is conducted in phases, where the activities and location of drilling are dependent on the previous phase. Therefore, the specific locations and extent of soil sampling and core drilling cannot be as yet confirmed.

- **Description and assessment of impacts identified**

A comprehensive list of all potential impacts of the prospecting as identified by the EAP and the specialists, are provided and are assessed.

- **Environmental Management Programme**

An Environmental Management Programme containing mitigation, management and monitoring measures and specifying roles and responsibilities was compiled with specialist input and are included in this report.

- **Stakeholder engagement**

Registered interested and affected parties including relevant organs of state, are consulted with during the process. All their comments will be formally responded to and incorporated

into the Final Basic Assessment Report and Environmental Management Programme that will be submitted to the competent authority.

23 Assessment of each identified potentially significant impact and risk

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

Potential impacts that may be caused by the proposed development will be identified using input from the following:

- Views of I&APs;
- Existing information;
- Baseline Specialist investigations;
- Site visit with the project team; and
- Legislation.

The following potential major direct, indirect and cumulative impacts were identified:

- Air pollution (dust, gaseous emissions), Land pollution;
- Water pollution (surface water, groundwater and wetlands);
- Land degradation, land-use and capability impacts;
- Ecological degradation;
- Land pollution;
- Aesthetic, pollution;
- Increased noise levels;

Table 27: Potential environmental impacts and mitigation measures.

Potential environmental impacts and sources	Measures to prevent, mitigate, minimize or manage the impacts
Impact: Air pollution (dust, gaseous emissions) **Source:** Establishment of camp site, movement of vehicles and drill rigs,	• Dust suppression measures will be implemented, and the area will be sprayed with water. • A low-speed limit (30 km/h) will be imposed to reduce dust generation. • All equipment and vehicles will be equipped with the manufacturers' standard exhaust systems which will reduce emissions. • Waste burning will not be allowed on site.
Impact: Water pollution (surface water, groundwater and wetlands) **Source:** Spillages from machines on site	Prospecting activities will not be conducted within a 100 m radius from a dam, river, stream, wetland or any water body and the following will be ensured: • Control and manage storm water • Prevent soil erosion and keep the water channel clean • Monitor the ground water
Impact: Land degradation, land-use and capability **Source:** Poor waste management	• Completed boreholes will be rehabilitated and re-vegetated. • Areas which do not form part of drilling site will not be disturbed • Prospecting will be conducted in an environmentally sustainable manner. • One of the prospecting objectives is to turn the area into other land use/s after closure. • Waste material will be properly managed
Impact: Ecological degradation **Source:** Uncontrolled vehicle movement and poor rehabilitation	• Disturbed biodiversity will be restored after closure. • Indigenous species will be used to re-vegetate the area. • No animals will be killed and collection of firewood will not be allowed. • Movement of vehicles will be restricted to designated area only.

Impact: Land pollution **Source:** Lack of proper waste management	• It is anticipated that a small amount of domestic waste will be generated by workers. Such waste materials will be kept in waste bins which will be disposed of on a regular basis at the registered waste disposal site. The same will apply to office waste. • Any spillages which may occur will be investigated and immediate action will be taken. Significant spills (>35 l) of any hazardous substance will be recorded and reported to the environmental personnel, DWA, DMRE and any other relevant authorities. • Scraps will be kept in designated areas prior delivery to the scrap yard. • All machinery will be serviced off site and also inspected for any leaks.
Impact: Aesthetic, pollution **Source:** Machinery	• The visual impact will be of temporary nature. • The surrounding trees and dense vegetation will also serve as the screen to the prospecting area.
Impact: Noise **Source:** Vehicle movements and drill rigs	• The operation will comply with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996) and its regulation as well as other applicable legislations regarding noise control. • Employees will be supplied with ear plugs. All prospecting vehicles are equipped with silencers and maintained in a road worthy condition. • All work will be carried out between 06:00 and 18:00. This will allow landowners and occupiers to have some respite from noise.
Impact: Death and theft of livestock **Source:** Drilling operation invasive on livestock	• Drilling will only occur during specified time • No drilling will occur near the area designated to keep livestock safe and away from harmful by-products of drilling. • No unauthorized personnel on site. All personnel on site will be registered with the landowner/farm keeper

Impact: Degradation of houses/infrastructure on site **Source:** Vibrations from drilling. Movement of drill rig	• No drilling to occur near infrastructure. Maintain a 100m distance from infrastructure. • Assessment and record keeping of current infrastructure status before drilling commences. • Compensation where it is due.

Table 28: Activity and potential impact in each phase.

Activity	Description	Affected environment	Potential impact
Prospecting phase			
Uploading of access roads	Access roads that already exist will be upgraded.	Soil	Increased erosion of soils due to the removal of vegetation.
		Natural vegetation	Destruction and removal of natural vegetation during site clearance.
		Surface water	Siltation of surface run-off due to soil erosion.
		Air quality	Dust emission due to wind erosion.
Transportation of equipment	The drilling operation will involve transportation of equipment to the project area.	Soil	Soil compaction due to the repetitive movement on gravel roads.
		Interested and Affected Parties	Damage to roads caused by movement of heavy vehicles and continual use of vehicles moving to and from the site.
		Air quality	Increased dust emissions due to entrainment of dust particles by the movement and operation of construction equipment.
Construction of surface infrastructure.	This will involve vegetation clearing and topsoil removal to construct a site office, a change house, toilet, etc.	Soil	Permanent compaction of soil in areas of infrastructure construction
		Land capability	Decreased land capability due to damage to the natural soil structure, soil loss through wind and water erosion and leaching of soil nutrients.
		Natural vegetation	Disturbance of vegetation could result in soil erosion due to exposed soils.
		Surface water	Altered surface flow dynamics around surface infrastructure and potential contamination of surface water due to fluid spillage.
		Groundwater	Groundwater contamination due to infiltration of contaminated water.

		Air quality	Dust from construction vehicles on gravel and secondary roads.
Soil Removal and Stockpile	It is assumed that the topsoil thickness averages 0.5 m over the disturbed area. Approximately 93 000 m^3 of topsoil will be removed.	Topography	Alteration of local topography and disturbance of natural drainage lines.
		Visual	Creation of stockpiles alters the visual quality of the landscape.
		Soil	Damage to the natural soil structure due to soil handling, removal and mixing of soil types and horizons. Removal of vegetation causes a change in the water runoff characteristics of the site and increases probability of soil erosion. This leads to the loss of topsoil and an increase of siltation in the streams and rivers with the runoff carrying sediment. Leaching of soil nutrients during long-term stockpiling.
		Land capability	Decreased land capability due to damage to the natural soil structure, soil loss through wind and water erosion and leaching of soil nutrients.
		Natural vegetation	Damage to natural vegetation due to deposition of dust emitted during the tipping and stockpiling, restricting photosynthesis.
		Animal life	Direct impacts on threatened fauna species, habitat disturbance and destruction, and disruption of birds nesting, foraging or roosting in the area.
		Surface water	Altered surface flow dynamics due to alterations in the onsite topography and increase of siltation in the streams and rivers with the runoff carrying sediment.
		Air quality	Dust emissions due to wind erosion during tipping of soil onto trucks and stockpiles, and exposure of stockpiles to wind erosion, and increased dust generation.
		Noise	Increase of noise of hauling trucks to topsoil stockpile site.
Placement of a fence	A temporary perimeter fence will be constructed around the	Animal life	Limitation of movement for domestic animals to grazing areas. This will prevent movement of domestic animals to demarcated areas, preventing injury.

	exploration site which will be limited to the demarcated area to protect operations and prevent people and domestic animals from harm.	Interested and Affected Parties	The temporary fence could prevent access to communal agricultural fields. The fence will also serve as a safety measure, preventing access to possibly hazardous areas.
Storage of fuel	Diesel fuel use for drilling will be determined and the storage capacity will not be triggered by the NEMA list of activities.	Soil	Soil contamination.
		Land capability	Decreased land capability due to contaminated soil.
		Natural vegetation	Damage to natural vegetation and loss due to hydrocarbon and chemicals spills.
		Animal life	Injury or loss of animals due to spillages of hydrocarbons, chemicals.
		Surface water	Contamination of surface water due to the spillage of hydrocarbons, chemicals or contaminated run- off sourced from contaminated soil.
		Groundwater	Groundwater contamination due to the infiltration of surface water contaminated with spilled hydrocarbons, chemicals.
Use of hydrocarbons, chemicals	The use of hydrocarbons, chemicals will take place and these will be stored on site in designated storage areas.	Soil	Soil contamination.
		Land capability	Decreased land capability due to contaminated soil.
		Natural vegetation	Damage due to natural vegetation and loss due to hydrocarbon and chemical spills.
		Animal life	Injury or loss of animals due to spillages of hydrocarbons, chemicals.
		Surface water	Contamination of surface water due to the spillage of hydrocarbons, chemicals or contaminated run-off sourced from contaminated soil.
		Groundwater	Groundwater contamination due to the infiltration of surface water contaminated with spilled hydrocarbons, chemicals.

Access roads	Existing access roads will be used to access the site and transport equipment onto and off-site. If need be, they will be upgraded.	Soil	Upgrading of existing roads to processing plant may result in soil erosion and loss.
		Land capability	Decreased agricultural and grazing potential of surrounding land due to deposition of dust emitted by vehicle entrainment on haul roads
		Natural vegetation	Decreased agricultural and grazing potential of surrounding land due to deposition of dust emitted by vehicle entrainment on haul roads. Site clearing and removal of topsoil could lead to soil erosion and soil loss.
		Surface water	Altered surface flow dynamics due to topsoil removal, topographical alterations and increased surface runoff from cleared areas. Surface water runoff overhaul roads will cause erosion and siltation of surface water resources. Surface water runoff contamination due to hydrocarbon spills from vehicles travelling on haul roads.
		Air quality	Dust pollution caused by construction vehicles
		Noise	Elevated noise levels due to continuous vehicular movement on haul roads.
		Interested and Affected Parties	Damage to roads could impact safety of people and animals.

24 Summary of specialist reports.

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

Table 29: List of Specialist Studies Undertaken

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.
Basic Soil Study	The soil classes map shows that the prospecting right area is largely covered with Association of Classes 13 and 16: Undifferentiated shallow soils, Association of Classes 1 to 4: Undifferentiated structureless soils, and land classes Red or yellow structureless soils with a plinthic horizon. It is anticipated that the prospecting activities will not lead to severe loss of soils and degradation of agricultural potential. • The exploration geologist must be advised to drill and sample more than 500m away from the waterbody on site.	X	Section 11.3 page 84

	• The prospecting boreholes must be cased after drilling and properly rehabilitated by cap sealing the borehole after drilling. • The core of Manganese Ore, Copper ore, Tin ore, Iron Ore, Nickel Ore, Zinc ore, Rare Earths and Magnesite, Diamond, Cobalt, Diamonds (alluvial) on the drilled boreholes, will be cleared from the ground immediately after logging by a geologist, to prevent washing and leaching on the water resource during precipitation events. • Absorbent kits will be made available near the drill rigs during drilling activities.		
Basic Hydrology Study	It can be concluded that the area is surrounded by various water bodies, however 100m buffers has been proposed, meaning no activities will take place within 100m from the water bodies. • On site there will be regular maintenance of the mobile toilets. • Once drilling, the team will rehabilitate the area and ensure the core is out of site. • Drilling within 100 meters of water resources will be avoided • Stormwater will be prioritized, and the management to prevent surface water contamination.	X	Section 11.4.1 Page 92

	• Clearing of vast amount of vegetation will be avoided, this is to preserve infiltration.		
Basic Hydrogeology Study	• On site there will be regular maintenance of the mobile toilets. • Once drilling, the team will rehabilitate the area and ensure the core is out of site. • Drilling within 100 meters of water resources will be avoided • The drilling machine used will be of minimum vibrations to avoid creating fissures in underlying rocks which could influence groundwater migration and leads to water contamination • Clearing of vast amount of vegetation will be avoided, this is to preserve infiltration. • Constant availability of waste bins; Compliance of National Environmental Management: Waste Management Act 59 of 2008. • Compliance of GN 704 4(b) and 7(a) and National Water Act 36 of 1998 (Chapter 3 – Part 4, Section 1 (a)(b). • No onsite vehicle or machinery repairs such as changing oil. • No onsite storage of oil, diesel, or petrol. • Cores will be logged on an impervious surface and will be cleared from the site immediately after logging.	X	Section 11.4.2 Page 95

	• ➢ The area is mountainous, this increases run-off, wastewater from drilling will be channelled and collected.		
Basic Ecology Study	• All ablution facilities must be placed far away from the waterbodies. • When placing structures in the prospecting area, highly sensitive areas must be avoided. • An alien and invasive management plan, as well as emergency preparedness plan during spillages must be always adhered to. • Excavated areas must be rehabilitated to avoid or limit erosion. • Drilled boreholes must be capped to avoid injuries to animals.	X	Section 11.5 Page 98

25 Environmental impact statement

25.1 Summary of the key findings of the environmental impact assessment

The majority of the prospecting activities are non-invasive and hence will have very low to negligible environmental or social impact. The invasive activities that entail the drilling of approximately 15 exploration holes will have a minimal environmental and social impact as each drill site will be confined to an area of 600m^2. This needs to be viewed in the context of the entire prospecting license area under application, which covers 3 410.61 ha.

The proposed prospecting site is classified as grazing land where a large area of the land consists of cultivated land. The moisture availability according to the map ranges from non to slight moisture and the land capability of the proposed prospecting area is grazing.

There is one perennial river running through the northern side of the project area and multiple non-perennial rivers found within the project boundaries.

From the large size of the proposed project area and the fact that there is settlement within the project boundaries implies that it is possible that there might be graves encountered at some point of the entire exploration period. Should there be such encounters, a buffer will be put in place upon discovery though no graves were observed during the site assessment.

The proposed prospecting operation will not affect any existing alternative land uses on the property or on adjacent property or non-adjacent property. The following actions are subject to the proposed mitigation measures and require monitoring:

- The clearing of vegetation
- The storage of hydrocarbon-based materials on site
- On-site waste management
- The creation of roads/tracks
- The removal of storage and soil
- The traversing of vehicles through populated areas within the prospecting area
- Groundwater: Monitor the water quality of the boreholes
- Surface Water: Monitor water quality of the stream and stream flow

Monitoring of the required mitigation measures is to take place on site daily by the site geologist. Annual monitoring audits are to take place by an appointed independent environmental assessment practitioner to compile the required annual environmental compliance report required by the DMR.

25.2 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)

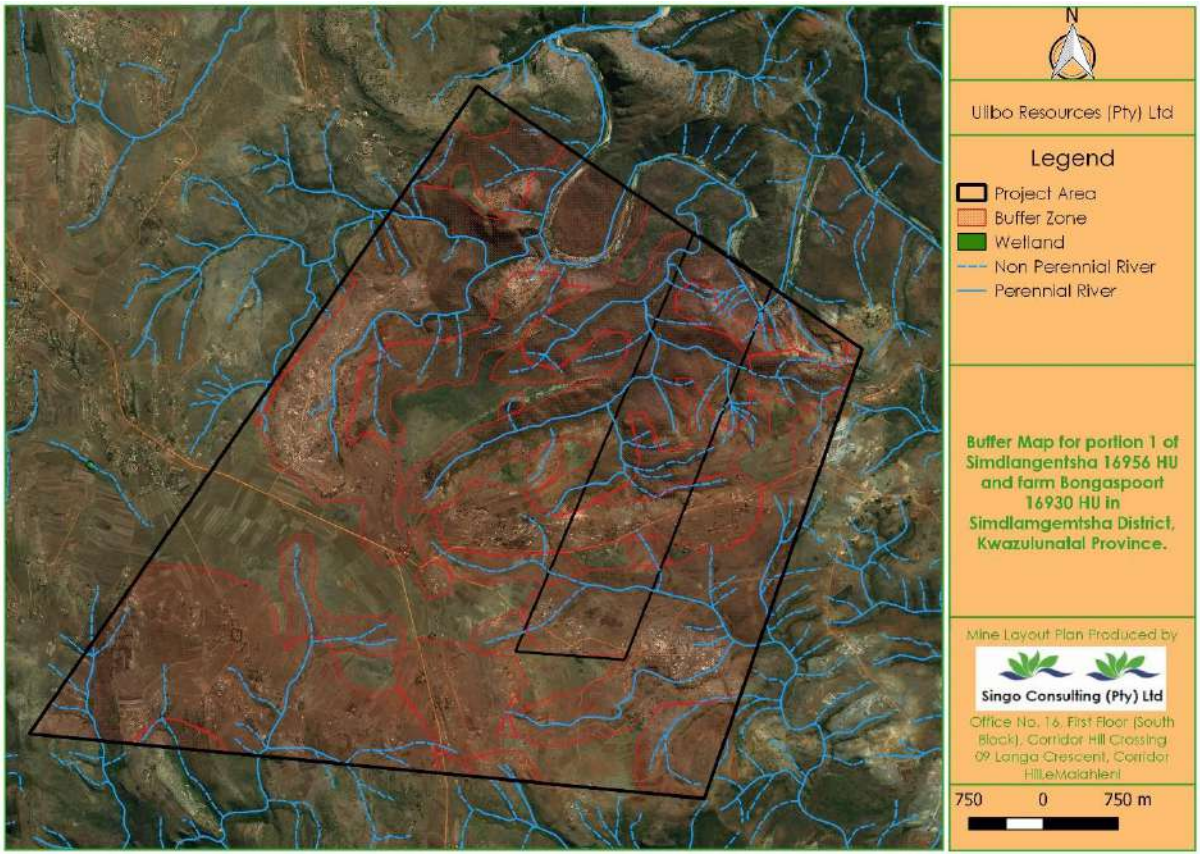


Figure 46: Buffer-Zone Map

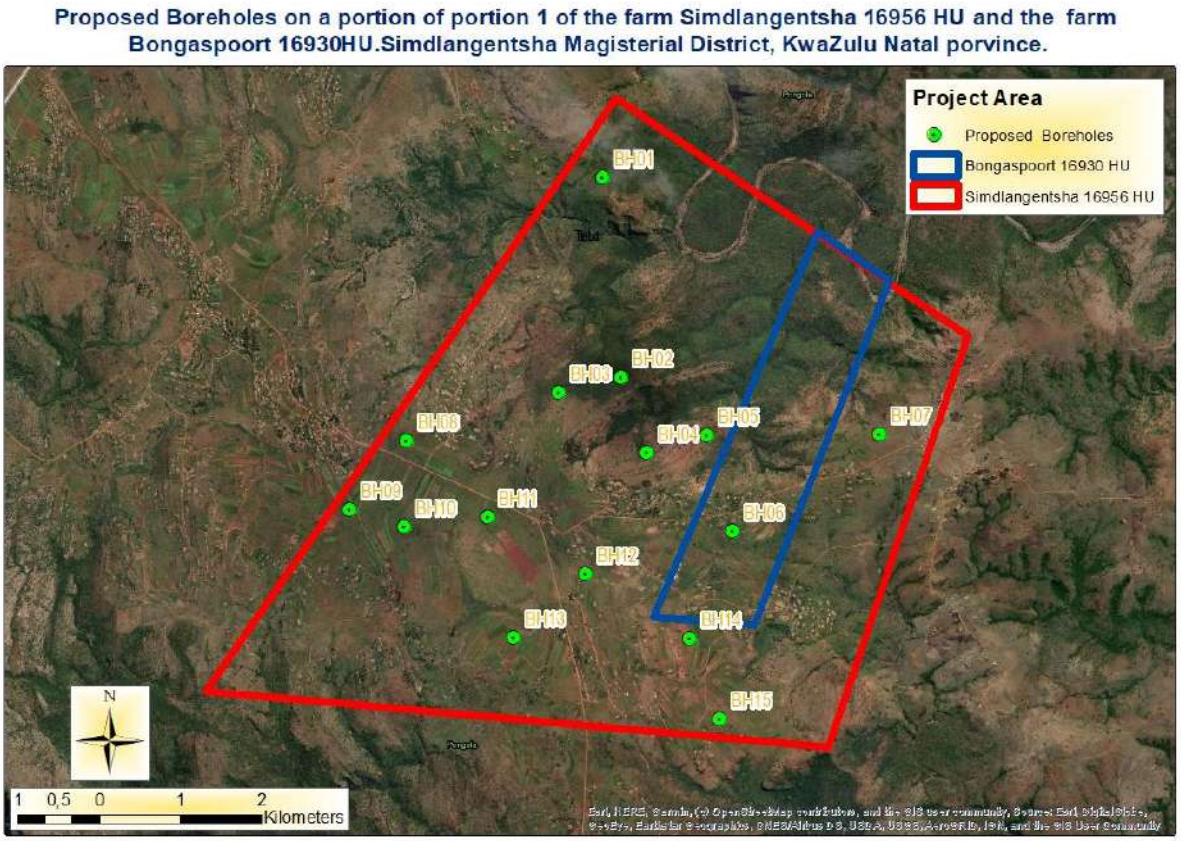


Figure 47: Borehole Location Map

25.3 Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

Table 30: Summary of positive and negative impacts

Negative	No concerns in terms of community health as all possible traces of waste and ore will be disposed of appropriately during prospecting. The following negative impacts may occur: • Noise: State-of-the-art drilling equipment will be used to minimise noise. Drilling will be conducted during office hours to limit disturbance of nearby residences. Invasion of privacy: Land access agreements will be signed before prospecting commences. This will limit unnecessary invasion.
Positive	• Discovery of an economically viable mineral resources • Employment contributing to the economy

	• Positive contribution to the South African Gross Domestic Product • Concurrent rehabilitation during Prospecting Activities

The proposed activities have exceptionally low significance since these are short term activities. The probability of occurrence of an impact was determined and most of these activities can be controlled and impacts can be reduced or avoided. Generally prospecting activities have low impact on the environment. The planned activities negative impacts can be controlled and avoided or minimised therefore the layout does not require revision. Mitigation measures will be used to control any potential impact.

26 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

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

- The objective of the EMPr include:
  - Providing enough information for the prospecting activities to prevent and avoid unnecessary social and environmental impact.
  - Providing a prospecting plan, guidance and guidelines to conduct prospecting with little to no impact on the environment.
  - Reducing impacts by implementing realistic operational management measures like imposing restrictions on the time of day when drilling can take place.

- The desired outcomes of the aforementioned objectives include:
  - Implementing a drilling programme that does not impact sensitive environmental feature
  - Implementing a drilling programme with the consent of the landowner
  - Ensuring that all temporary impacts are reduced.
  - Rehabilitating the area after drilling to its original (or better) state.
  - Reducing noise by operating during office hours and giving the nearby residence peace and quiet.
  - Managing water and soil pollution through containment.

- Managing ecological degradation by implementing pollution prevention measures, minimising land clearing and restricting working hours.
- Identifying impacts to inform planning, execution and rehabilitation. During the planning phase, identifying of such impacts is vital to implement and mitigate during construction of the site office and accommodation, as well as during drilling, rehabilitation and closure.

- Impact management objectives

Soils: Prevent soil degradation by establishing effective rehabilitation measures.

Dust: Establish cost-effective measures like spraying of working areas to reduce dust.

Vegetation: Limit flora removal to the footprint area and mitigate against it as far as possible.

Animal life: Limit fauna removal to the footprint area and mitigated against it as far as possible.

Visual impacts: Limit the visual impact of the proposed activity and mitigate against it as far as possible.

The Company will operate on the principle that "prevention is better than cure" and so will institute procedures to reduce the risk of emergencies taking place. These will include ensuring that all contracts specify that the contractor is required to comply with all the environmental measures specified in this EMPr, environmental awareness training, on-going risk assessment and emergency preparedness.

All employees shall have the telephone numbers of emergency services, including the local ambulance and firefighting service. All employees must be made aware of procedures to be followed during the environmental awareness training course.

27 Aspects for inclusion as conditions of Authorisation.

(Any aspects which must be made conditions of the Environmental Authorisation)

The following conditions should be included into the Authorisation:

- A map detailing the drilling locations should be submitted to the relevant landowners and the DWS and DMRE prior to the commencement of these activities;
- Maintain a minimum 100 m buffer from any infrastructure or dwelling;

- The company should comply with all environmental legislation. Specific aspects to be adhered to from environmental legislation include;
  - National Environmental Management Act, Act 107 of 1998 (NEMA),
  - Minerals and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA),
  - National Water Act, Act36 of 1998 (NWA)
  - Conservation of Agricultural Resources Act, Act No. 43 of 1983 (CARA)
- No activities may be undertaken in or near water bodies;
- Heritage Impact Assessment must be undertaken where roads will be cleared and where drilling sites will be established, prior to the commencement of these activities; and
- No activities, with the exception of the driving to fetch, may take place within 100 m from any river.

28 Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

- All information provided to the environmental team, by the applicant and I&APs was correct and valid at the time that it was provided;
- The investigations undertaken by specialists during the BA process, indicate the development site as suitable and technically acceptable, except for the western portion, which is sensitive and recommended that prospecting not take place
- It is not always possible to involve all I&APs individually, however, every effort has been made to involve as many affected stakeholders as possible;
- The information provided by the applicant and specialists was accurate and unbiased; and
- The scope of this investigation is limited to assessing the environmental impacts associated with the prospecting activity.

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

29.1 Reasons why the activity should be authorized or not

In general, it is recognised that the proposed prospecting activities have the potential to pose various risks to the environment as well as to the residents or businesses in the surrounding area. However, based on the findings of this BA documented in this report, all impacts can be mitigated to insignificant levels.

This report shows that the proposed development has the potential to provide socio-economic benefits to the local and regional communities. The EAP therefore recommends that the proposed activities be approved on condition that the EMPR is strictly implemented and monitored for compliance and that the northern portions of the study area are excluded from prospecting.

Not implementing the prospecting activities will result in a loss of information on mineral reserves present on the study area. Should economically feasible reserves exist on the study area and the applicant cannot prospect, the opportunity to utilise the reserves for future mining and the minerals will be sterilised and resultant socio-economic benefits will be lost.

The proposed prospecting activities have the potential to have a negative impact on the ecological environment as well as the social environment of the area. These impacts, however, can potentially be prevented, minimised, mitigated and managed to low and very low levels, as shown through the impact assessment

It is the opinion of the EAP that the activity may be authorized as the targeted proposed prospecting area is said to have occurrences of the applied for minerals. The fact that there are Zama Zamas (illegal operations) who have attempted to exploit minerals in the area is a good indication that the area should be looked into and further studies, not only for the benefit of Ulibo Resources (Pty) Ltd but also for knowledge of what minerals could be found in the area. Should the prospecting be successful, this will lead to economic growth of the Bongaspoort area and ultimately uPhongolo Local Municipality.

29.2 Conditions that must be included in the authorisation

The following conditions should be included into the authorisation:

- The EMPr is a contractual document and must be implemented at all times during the prospecting phase;
- An independent environmental control officer (ECO) must be appointed to monitor the implementation of the EMPR and audit reports to be kept by the applicant;
- All contractors and employees of Jaments (Pty) Ltd must be made aware of the EMPr and its requirements as well as the impact of not implementing the measures of the EMPr;
- Copies of the EMPr, Environmental Authorisation and any emergency procedures and method statements, must be kept on site and be available on request of the Competent Authority.

30 Period for which the Environmental Authorisation is required.

The Prospecting Right has been applied for a period of five years. The Environmental Authorisation should therefore allow for the five years of prospecting and one year for decommissioning and rehabilitation.

31 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)

Confirmed.

31.1 Financial Provision

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

CALCULATION OF THE QUANTUM

Applicant: ULIBO RESOURCES (Pty) Ltd
Evaluator: **Singo Consulting (Pty) Ltd**

Ref No.: KZN 30/5/1/1/2/11230 PR
Date:12-07-2

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	19	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	271	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	400	1	1	0
3	Rehabilitation of access roads	m2	300	49	1	1	14700
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	471	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	257	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	542	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	284292	1	1	0
7	Sealing of shafts adits and inclines	m3	0	146	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	189528	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	236054	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	685612	1	1	0
9	Rehabilitation of subsided areas	ha	0	158701	1	1	0
10	General surface rehabilitation	ha	0,9	150138	0,15	1	20268,63
11	River diversions	ha	0	150138	1	1	0
12	Fencing	m	0	171	1	1	0
13	Water management	ha	0	57087	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	19980	1	1	0
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
					Sub Total 1		34968,63

1	Preliminary and General	4196,2356	weighting factor 2 1	4196,2356
2	Contingencies	3496,863		3496,863
			Subtotal 2	42661,73
			VAT (15%)	6399,26
			Grand Total	49061

Sign
Date 12/07/2022

31.2 Explain how the aforesaid amount was derived.

(The following section details the methodologies adopted to calculate the quantities, associated rehabilitation (clean closure) rates and eventually the final (clean) closure cost estimate)

An amount of R49 061.00 is required to manage and rehabilitate the environment. The financial provision amount was calculated utilising the methodology as prescribed by the Guideline Documents for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine issued by the DMRE.

31.3 Confirm that this amount can be provided for from operating expenditure.

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

Ulibo Resources (Pty) Ltd herewith confirms both its capacity and willingness to make the financial provision required should the prospecting right be granted. Work will be approved on a phase-by-phase basis, dependent on the results obtained in the previous phase i.e. although prospecting work may be provided for financially in the budget for a specific year, it will only take place if justified.

32 Specific Information required by the competent Authority

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

32.1.1 Impact on the socio-economic conditions of any directly affected person.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an Appendix)

Potential impacts on landowners, land occupiers, communities or individuals or competing land uses in the area include:

- Potential soil pollution which may result from any hydrocarbon spills where heavy machinery and vehicles are parked such as the hard park area because they contain large volumes of lubricating oils, hydraulic oils, and diesel to run. There is always a chance of these breaking down and/or leaking;

- Contamination of stormwater runoff and groundwater, caused by chemicals such as hydrocarbon-based fuels and oils or lubricants spilled from heavy vehicles and machinery and fuel storage area.
- Visual impacts: Visibility from sensitive receptors / visual scarring of the landscape as a result of the prospecting activities.
- Nuisance and health risks caused by an increase in the ambient noise level as a result of noise and vibration impacts associated with the operation of vehicles, machinery and equipment.
- Increased dust pollution due to vegetation clearance and vehicles driving on gravel roads and drilling.
- Gaseous emissions from vehicles and machinery may cause an impact on ambient air quality.
- Generation of additional general waste, litter and building rubble and hazardous waste.
- Minor impact caused by need for services i.e. water, electricity and sewerage systems during the prospecting phase causing additional strain on natural resources and service infrastructure.
- Minor change in traffic patterns as a result of traffic entering and exiting the site on the surrounding road infrastructure and existing traffic.
- Nuisance, health and safety risks caused by increased traffic on and adjacent to the study area including cars, and heavy vehicles.
- Possibility of prospecting activities and workers causing veld fires, which can potentially cause injury and or loss of life to workers and surrounding landowners, visitors and workers.
- Increased risk to public and worker safety: If not fenced off, the public and workers may fall into excavated areas and trenches.
- Potential creation of very limited extent short term employment opportunities for the local community, during the prospecting phase.
- Multiplier effects on local economy will be positive, but very limited in extent and only short term.

Mitigation measures are included in this report, as well as the EMPR.

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

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

As outlined in earlier sections of this report, prospecting will be undertaken in phases; the first phase being a desktop assessment, followed drilling.

Where graves or fossils are identified proposed boreholes will be moved to avoid features of this type. If fossils or more graves are discovered, the relevant authorities will be notified immediately, and drilling will be stopped in this area.

The area does not have protected areas, threatened ecosystems or critical biodiversity, however no sensitive parts will be negatively affected by the drilling procedures owing to the small scale of the prospecting activity, the only potential negative impact is related to the proposed borehole sites that will need to be cleared and possibly access roads to some of these sites. These will be placed on previously disturbed land or tracks. Any natural vegetation will be avoided as much as possible.

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

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

The proposed drilling activities requested as part of this authorization authorisation is the only current viable manner in which a mineral resource can be identified and used to generate a SAMREC and/or JORC- compliant resource which is a minimum requirement to determine whether it is viable to invest in a future mine.

PART B

34 ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

34.1 Environmental management programme

34.1.1 Details of the EAP

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 3(a) herein as required).

The requirement for the provision of the details and expertise of the EAP are included in PART A.

34.1.2 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 (9)(e) herein as required).

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 3.1.

34.1.3 Composite Map

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

Exploration is a temporal activity thus no permanent structures will be erected; however a general layout is enclosed refer to Figure 2 .

34.2 Description of Impact management objectives including management statements

34.2.1 Determination of closure objectives.

(ensure that the closure objectives are informed by the type of environment described)

As previously mentioned, each phase of the prospecting activities is dependent on the success of the previous. Depending on the outcome of the Phase 1 assessment, drilling programme will be initiated.

The prospecting activities are dependent on the preceding phase (non-invasive). Prospecting is conducted in phases, where the activities and location of drilling are dependent on the previous phase. Therefore, the specific locations and extent of soil sampling and diamond core drilling cannot as yet be confirmed. Mapping of prospecting activities can also not be conducted.

The closure objectives include:

- Ensure that there are no safety risks associated with the drill boreholes through drill hole capping and backfilling;
- Rehabilitate any pollution that occurred through hazardous spills or waste materials and remove the source of the pollution;
- Establish an area that is not susceptible to soil erosion;
- Re-vegetate disturbed areas with endemic plant species that occur naturally within the area.

34.3 Environmental Legislation

To comply with all environmental legislation. Specific aspects to be adhered to from environmental legislation include;

34.3.1 National Environmental Management Act, Act 107 of 1998 (NEMA)

As the NEMA is the cornerstone of all environmental legislation, the management measures implemented by Ulibo Resources (Pty) Ltd will strive to adhere to the principles of NEMA:

- That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- that pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- that the disturbance of landscapes and sites that constitute the nations cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
- that waste is avoided, or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner;
- that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;
- that a risk averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and
- that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

35 Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.

A total of 1000L of water will be used per day on maximum drilling production day and a total of approximately R30 000 L will be used for all the proposed 15 boreholes.

35.1 Has a water use licence has been applied for?

No Water Use Licence has been applied for, since no water extraction and diversion will be done from any water source. All water used on site will be transported to site by a water tank for the sole purpose of this project. This water will be bought from the municipality or licenced water supplier that sells potable water or treated industrial water for which a water sale agreement will be provided before work commences and is submitted to the DMRE.

35.2 Impacts to be mitigated in their respective phases

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

Table 31: Impacts to be mitigated

Activities	Phase	Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Site clearance	Construction Operation	0.9 ha, short term and localized	• Demarcation of sensitive areas in consultation with relevant specialists and ECO; • Utilise local labour if possible; • Minimise removal of vegetation as far as possible; • Identification and relocation of protected species by a qualified ecologist (and application or the relevant biodiversity permits where required); • Minimize dust generation; • Limit vehicle access; • Implement alien vegetation management; • Ongoing identification of risks and impacts; • Emergency preparedness; • Monitoring and review; and • Avoid disturbance of fauna as much as possible, especially bird nesting sites.	NEMA MPRDA NEMBA NEMAQA Dust regulations NWA DWAF Best Practice Guidelines	Throughout Construction and operation

Site access	Construction Operation	3 410.61 ha, short term and localized	• All employees and visitors to the site must undergo a site induction which shall include basic environmental awareness and site-specific environmental requirements (e.g. site sensitivities and relevant protocols/procedures). This induction should be presented or otherwise facilitated by the Contractors EO/Mine EO wherever possible. • Landowners/lawful occupiers must be notified prior to accessing properties. A date and time that is suitable to landowners/lawful occupiers and is reasonable to the applicant should be negotiated and agreed upon. • The number, identity of workers, work location and work to be done must be provided to the landowner/lawful occupier prior to going on site. • Consideration must be taken by the applicant and/or contractors when on site not to interfere with the existing land uses and practices.	NEMA OHS & MHSA	Throughout Construction and operation
Establishment of site infrastructure	Construction	short term and localized	• Minimise physical footprint of construction; • Ensure construction is consistent with occupational health and safety requirements; • Minimise vegetation clearance; • Ensure proper and adequate drainage; • Minimise waste and control waste disposal; • Fencing of all drill sites with security access control and warning signs; • Establish waste storage areas for recycling; • Ensure adequate containment of waste to prevent pollution; • Minimise dust generation; • Limit vehicle access to approved access roads; • Prepare contingency plans for spillage	NEMA MPRDA NEMBA NEMAQA Dust regulations NWA DWAF Best Practice Guidelines NHRA	Throughout Construction and operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Storage of construction vehicles	Construction and Operation	short term and localized	• Any equipment that may leak, and does not have to be transported regularly, must be placed on watertight drip trays to catch any potential spillages of pollutants. The drip trays must be of a size that the equipment can be placed inside it; • Drip trays must be cleaned regularly and shall not be allowed to overflow. All spilled hazardous substances must be collected and adequately disposed of at a suitably licensed facility; and • Compacting of soil must be avoided as far as possible, and the use of heavy machinery must be restricted in areas outside of the proposed exploration sites to reduce the compaction of soils.	NWA DWAF BPG	Throughout Construction and operation

Transportation/ access to and from drill sites	Construction and Operation	short term and localized	• Where possible, drill sites should be located along existing access roads to reduce the requirement for additional access roads; • Any new temporary access routes to a drill site should result in minimal disturbance to existing vegetation; • Prior to accessing any portion of land, the Applicant must enter into formal written agreements with the affected landowner. This formal agreement should additionally stipulate landowners special conditions which would form a legally binding agreement;	NEMA NEMBA CARA NEMAQA Dust Regulations Road Traffic Act	Throughout Construction and operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• All farm gates must be closed immediately upon entry/exit; • Under no circumstances may the contractor damage any farm gates, fences, etc.; • On-site vehicles must be limited to approved access routes and areas on the site so as to minimize excessive environmental disturbance to the soil and vegetation on site, and to minimize disruption of traffic (where relevant); • All construction and vehicles using public roads must be in a roadworthy condition and their loads secured. They must adhere to the speed limits and all local, provincial and national regulations with regards to road safety and transport; • Damage caused to public roads as a result of the construction activities must be repaired in consultation with the relevant municipal authorities; and • All measures should be implemented to minimize the potential of dust generation.		
Storage of hazardous substances	Construction and Operation	short term and localized	All hazardous substances (e.g. fuel, grease, oil, brake fluid, hydraulic fluid) must be handled, stored and disposed of in a safe and responsible manner so as to prevent pollution of the environment or harm to people or animals. Appropriate measures must be implemented to prevent spillage and appropriate steps must be taken to prevent pollution in the event of a spill; and way that does not pose any danger of pollution even during times of high rainfall.	NWA NEMWA DWAF BPG NEMA	Throughout Construction and operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			specific and secured areas, and stored at all-time within bunded areas; • Adequate spill prevention and clean-up procedures should be developed and implemented during the prospecting activities. • Should any major spills of hazardous materials take place, such should be reported in terms of the Section 30 of the NEMA.		
Waste management	Construction and Operation	Short-medium term, localized	• Waste generated on site must be recycled as far as possible. Recyclable waste must not be stored on site for excessive periods to reduce risk of environmental contamination; • Drill muds, formation water (if encountered), etc. would constitute waste and must be classified and ranked in terms of relevant legislation for correct disposal; and • A Waste Management System must be implemented, and provide for adequate waste storage (in the form of enclosed containers) waste separation for recycling, and frequent removal of non-recyclable waste for permanent disposal at an appropriately licensed waste disposal facility. No waste material is to be disposed of on site.	DWAF Minimum requirements for waste disposal NEMWA	Throughout Construction and operation

Prospecting boreholes: 15 sites ,with a footprint of 600 m² each	Construction and Operation Decommissioning	0,9 ha, short term	• Vegetation clearing for prospecting sites should be kept to a minimum in order to reduce the disturbance footprint; • Compaction of soil must be avoided as far as possible, and the use of heavy machinery must be restricted in areas outside of the proposed prospecting sites to reduce the compaction of soils; • All measures should be implemented to minimize the potential of dust generation; • Noise attenuation on engines must be adequate, and the noisy activities must be restricted as far as is possible to times and locations whereby the potential for noise nuisance is reduced; • When working near to a potential sensitive area, the contractor must limit the number of simultaneous activities to the minimum; • Ensure proper storage of fuels; • On-site vehicles must be limited to approved access routes and areas on the site so as to minimize excessive environmental disturbance to the soil and vegetation on site, and to minimize disruption of traffic; • Workforce should be kept within defined boundaries and to agreed access routes. • No invasive prospecting activities to be undertaken within 100m of a watercourse. • Should any watercourse be affected, then the necessary water use licences should be	SANS 10103 ECA Noise Regulations NEMAQA Dust Regulations NWA	Throughout Construction and operation and decommissioning

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• obtained from the Department of Water and Sanitation. • No ablution of site laydown areas is to be located within 100m of a watercourse. • Where drinking water/ livestock watering boreholes are to be affected, and where a pollution event occurs at a particular borehole, then the advice of a geohydrologist should be sought with regards to the need for plugging and casing of the prospecting boreholes.		
Prospecting	Construction and Operation	0,9 ha, short term	Workers must be easily identifiable by clothing and ID badges. Workers should carry with them, at all times a letter from the applicant stating their employment, title, role and manager contact details.	OHS and MHSA	Throughout Construction and operation
Resource definition drilling	Planning Phase Construction and Operation	short term	Local residents (landowners and directly adjacent landowners) should be notified of any potentially noisy activities or work and these activities should be undertaken at reasonable times of the day. This work should not take place at night or on weekends;	MPRDA Regulations GN R527 SANS 10103	Planning Phase Throughout Construction and operation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• The contractor must attempt to restrict noisy activities as far as is possible to times and locations whereby the potential for noise nuisance is reduced; • Dust suppression methods must be applied when necessary to restrict the visual impact of dust emissions. • Any spills of hydrocarbons or fluids used during operation, must be cleaned up immediately; • An above ground drilling sump must be used to contain drilling mud in order to reduce surface and groundwater contamination. No earthen mud sumps are to be constructed and utilized; • No prospecting boreholes should be drilled in the immediate vicinity of existing private boreholes; • Soils in drilling areas where disturbances will be encountered must be stripped and stockpiled outside affected areas for use after completion of the drilling program. • Topsoil must be adequately stripped to the correct depth and stored separately from subsoils; • A liner should be placed over the drill pad and drip trays must be used in all areas where hydrocarbons are handled; • On-site vehicles must be limited to approved access routes and areas on the site so as to	ECA Noise Regulations NEMAQA Dust Regulations NWA DWAF BPG NHRA	

			• minimize excessive environmental disturbance to the soil and vegetation on site, and to minimize disruption of traffic; • The designated competent authority (DMR) may, at the cost of the Applicant, appoint an independent and competent person to undertake borehole examination. • Should any fugitive emissions be detected, then the recommendations of the must be undertaken throughout the drilling activity up to the decommissioning of the wells. • Should any chance finds be uncovered during the construction phase, these must be handled in accordance with the requirements of the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA); and • If a possible heritage site (including graves) or artefact is discovered during construction, all operations in the vicinity of the discovery (at least 30 m buffer) should stop and a qualified specialist contracted to evaluate and recommend appropriate actions. Depending on the type of site that can include initiating a grave relocation process, documentation of structures or archaeological excavations. • Should fossil remains be discovered in the during any phase of construction, either on the surface or exposed by fresh excavations, the ECO responsible for these developments should be alerted immediately. Such discoveries ought to be protected (preferably in situ) and the ECO should alert SAHRA so that appropriate mitigation (e.g.		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
			• recording, sampling or collection) can be taken by a professional palaeontologist. • The Final BAR and appendices must be submitted to SAHRA for record purposes; • If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit, must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA; and • If the development receives an Environmental Authorisation (EA), SAHRA must be informed and all documents pertaining to the EA must be uploaded to the SAHRIS Case file.		

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Refuelling	Construction and Operation	Short term and localized	• Refuelling may only take place within demarcated areas that is subject to appropriate spill prevention and containment measures refuelling and transfer of hazardous chemicals and other potentially hazardous substances must be carried out so as to minimize the potential for leakage and to prevent spillage onto the soil; • Drip trays should be utilized in relevant locations during transfer so as to prevent such spillage or leakage. Any accidental spillages must be contained and cleaned up promptly.	NWA DWAF BPG	Throughout Construction and operation
Maintenance and repair	Construction and Operation	Short term and localized	• Trucks, machinery and equipment must be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks must be cleaned up immediately using spill kits or as per the emergency response plan. For large spills a hazardous materials specialist shall be utilized; • Accidental hydrocarbon spillages must be reported immediately, and the affected soil should be removed, and rehabilitated or if this is not possible, disposed of at a suitably licenced waste disposal facility.	NWA DWAF BPG NEMA	Throughout Construction and operation

Borehole Closure	Decommissioning and Closure	Short term and localized	• Where groundwater is encountered during drilling, all affected prospecting boreholes that will not be required for later monitoring or other useful purposes should be plugged and sealed with cement to prevent possible cross flow and contamination between aquifers; • Cement and liquid concrete are hazardous to the natural environment on account of the very high pH of the material, chemicals contained.	NWA DWAF BPG	Throughout Decommissioning and Closure

Activities	**Phase**	**Size and Scale of Disturbance**	**Mitigation Measures**	**Compliance with Standards**	**Time Period for Implementation**
			therein. As a result, the contractor shall ensure that: • Concrete shall not be mixed directly on the ground; • The visible remains of concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste, (Washing of visible signs into the ground is not acceptable); and o All excess aggregate shall also be removed.		

Removal of surface infrastructure	Decommissioning	Short term and localized	• All infrastructure, equipment, and other items used during prospecting will be removed from the site. • Compaction of soil must be avoided as far as possible. The use of heavy machinery must be restricted in areas outside of the proposed prospecting sites to reduce the compaction of soils.	MPRDA Rehab Plan	Decommissioning
Removal of waste	Decommissioning	Small scale and localized	• Any excess or waste material or chemicals, including drilling muds etc. must be removed from the site and must preferably be recycled (e.g. oil and other hydrocarbon waste products). Any waste materials or chemicals that cannot be recycled must be disposed of at a suitably licensed waste facility.	NWA DWAF BPG	Decommissioning

Activities	**Phase**	**Size and Scale of Disturbance**	**Mitigation Measures**	**Compliance with Standards**	**Time Period for Implementation**

Rehabilitation	Rehabilitation	All disturbed areas	• Restoration and rehabilitation of disturbed areas must be implemented as soon as prospecting activities are completed; • Sites must be restored to the original condition with vegetation cover (where applicable) equalling the surrounding vegetation cover; • All debris and contaminated soils must be removed and suitably disposed of; • Contours and natural surrounding must be reformed; • Natural drainage patterns must be restored; • All surface infrastructure on site must be removed; • Temporary access routes/roads must be suitably rehabilitated; and • Sites must be monitored by the ECO (including relevant specialist's inputs if, necessary) for adequate rehabilitation until the desired rehabilitation objectives have been achieved.	MPRDA Rehab Plan NEMA	Rehabilitation
Consultation	Planning Phase Construction and Operation	Medium term, local	• Stakeholder engagement will continue throughout the prospecting activities to ensure the community and landowners are kept informed and allowed to raise issues.	NEMA OHS and MHSA	Planning Phase Throughout Construction and Operation

Monitoring	Post-Operational	All rehabilitated areas	The post-operational monitoring and management period following decommissioning of prospecting activities must be implemented by a suitable qualified independent party for a minimum of one (1) year unless otherwise specified by the competent authority. The monitoring activities during this period will include but not be limited to: • Biodiversity monitoring; and • Re-vegetation of disturbed areas where required. Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed prospecting activities and incorporated into post closure monitoring and management.	MPRDA Rehab Plan	Post-operation

35.3 Impact Management Actions and Outcomes

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

Table 32: Impact Management Actions and Outcome

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Site clearance	• Deterioration and damage to existing access roads and tracks; • Dust generation; • Clearance of vegetation; • Invasion by alien species; • Sedimentation • Erosion	Topography; Soil; Air Quality; Surface Water; Groundwater; Transportation	Construction Operation	Avoid and control through implementation of EMP mitigation measures (e.g. speed limit enforcement, vehicle maintenance)	NEMA NEMBA CARA Threatened or Protected Species (TOPS) regulations NEMAQA Dust regulations NWA DWAF best Practice Guidelines

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Establishment of base camps and access	• Interference with existing land uses • Safety and security risks to landowners and lawful occupiers; • Deterioration and damage to existing access roads and tracks; • Dust generation; • Clearance of vegetation; • Pollution of soils • Contamination on surface and ground	Topography; Landform; Soil disturbance; Fauna and Flora; Air Quality; Surface Water; Groundwater; Socioeconomics	Construction Operation	Avoidance and control through preventative measures (e.g. communication with landowners, site access control) Remedy through application of mitigation measures in EMP	NEMA MPRDA NEMBA CARA Threatened or Protected Species (TOPS) regulations NEMAQA Dust regulations NWA DWAF best Practice Guidelines

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Storage of construction vehicles	• Pollution of surface and groundwater resources from potential hydrocarbon spills; and • Compaction of soils	Surface water; Groundwater; Soils.	Construction Operation	Avoid through implementation of EMP mitigation measures (e.g. communication with landowners) Control through implementation of ESMS	Protected Species (TOPS) regulations NEMAQA Dust regulations NWA DWAF best Practice Guidelines

Transportation to and from drill sites	• Soil compaction; • Disturbance and loss of fauna and flora, Wearing and tearing of existing roads and Dust generation from increased traffic.	Soil disturbance; Fauna and Flora; Air quality.	Construction Operation	Avoid and control through implementation of EMP mitigation measures (e.g. speed limit enforcement, vehicle maintenance)	NEMA NEMBA CARA Threatened or Protected Species (TOPS) regulations NEMAQA

Activity	Potential Impact	Aspects Affected	Phase	Mitigation Type	Standard to be Achieved
Storage of hazardous substances	Potential hydrocarbon spills that could pollute surface and ground water resources.	Surface water; Groundwater.	Construction Operation	Avoid and control through implementation of EMPr mitigation measures (e.g. speed limit enforcement, vehicle maintenance)	NEMA NEMBA NWA DWAF best Practice Guidelines

Waste management	Pollution of habitats and surrounding areas.	Pollution	Construction Operation	Avoid and control through implementation of EMP mitigation measures (e.g. speed limit enforcement, vehicle maintenance	DWAF minimum requirement for waste disposal

Activity	**Potential Impact**	**Aspects Affected**	**Phase**	**Mitigation Type**	**Standard to be Achieved**
Prospecting boreholes	• Vegetation clearance; • Possible erosion; • Changes in drainage and surface hydrology; • Soil disturbance and compaction; • Emissions from vehicles; • Land use conflict; • Noise disturbance due to acoustic sources; • Dust generation; • Disturbance or damage of palaeontological rsources; Potential spills of hydrocarbons; • Influx of people;	Ecology; Topography; Access/footprint; Soil disturbance; Noise; Air Quality; Socio-economics; Groundwater	Construction Operation Decommissioning	Control through implementation of EMPR mitigation measures	SANS10103 ECA Noise Regulations NEMAQA Dust regulations NWA

	• Impact on groundwater				
Resource definition drilling	• Vegetation clearance • Removal of topsoil; • Changes in drainage and surface hydrology; • Drainage and soil contamination; • Land use conflict; • Dust generation;	Air Quality; Noise; Surface water; Groundwater,	Operation	Control through implementation of EMPR mitigation measures	SANS10103 ECA Noise Regulations NEMAQA Dust regulations

Activity	**Potential Impact**	**Aspects Affected**	**Phase**	**Mitigation Type**	**Standard to be Achieved**

	• Disturbance of wildlife and communities in close vicinity; • New access roads; • Increased transportation; • Damage to local infrastructures; • Disturbance or damage of palaeontological resources; • Influx of people; • Waste water discharge; • Spillage and leaks of hydrocarbons; Pollution or interplay between groundwater aquifers; Waste disposal.				NWA DWAF best Practice Guidelines	
Refuelling	Potential hydrocarbon spills that could pollute soil or surface and/or groundwater resources.	Pollution; Surface water; Groundwater	Construction Operation	Control through implementation of EMPr mitigation measures	NWA DWAF best Practice Guidelines	
Maintenance and repair	Potential hydrocarbon spills that could pollute surface and groundwater resources.	Pollution; Surface water; Groundwater	Construction Operation	Control through implementation of EMPr mitigation measures	NWA	

Activity	**Potential Impact**	**Aspects Affected**	**Phase**	**Mitigation Type**	**Standard to be Achieved**

Borehole closure	• Pollution of groundwater resources; • Potential pollution of habitats with cement residue that may be exposed to runoff etc.	Pollution; Groundwater	Decommissioning	Control through implementation of EMPr mitigation measures	NWA
Removal of surface infrastructure	• Soil compaction; • Pollution of soil and surrounding vegetation.	Landform; Topography; Soils.	Decommissioning	Control through implementation of EMPr mitigation measures	MPRDA In accordance with Rehab plan
Rehabilitation	• Soil compaction; • Soil and Water contamination; • Erosion; • Change is drainage and surface hydrology; • Loss of habitat; and • Disturbance to wildlife and communities in close vicinity	Topography Land use Soil disturbance Ecology Surface water Groundwater	Rehabilitation	Control through implementation of EMPr mitigation measures	MPRDA In accordance with Rehabilitation plan
Monitoring of rehabilitated sites	• Soil compaction; • Soil and Water contamination; • Erosion; • Disturbance to wildlife; and communities in close vicinity.	Topography Land use Soil disturbance Ecology Surface water Groundwater	Post-operation	Control through adhering to monitoring requirements	MPRDA and regulations

36 Financial Provision

36.1 Determination of the amount of Financial Provision.

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

As previously mentioned, each phase of the prospecting activities is dependent on the success of the previous. Depending on the outcome of the Phase 1 assessment, drilling programme will be initiated. The location and extent drill sites can therefore not be determined at this stage.

For a prospecting operation such as this, the primary closure and environmental objectives are to:

- Eliminate any safety risk associated with drill holes and sumps though adequate drill hole capping and backfilling.
- Remove and / or rehabilitate all pollution and pollution sources such as waste materials and spills
- To establish rehabilitated area which is not subject to soil erosion which may result in the loss of soil, degradation of the environment and cause pollution of surface water resources
- Restore disturbed area and re-vegetate these areas with grass species naturally occurring in the area to restore the ecological function of such areas as far as is practicable as committed in the EMPr
- To record and communicate the results of the monitoring programme during decommissioning to the participating stakeholders.
- To receive an effective closure certificate (should the prospect indicate that the resource(s) would not support a sustainable prospecting operation

37 Confirm specifically that the environmental objectives in relation to closure have been consulted with landowners and interested and affected parties

This Basic Assessment Report and Environmental Management Programme will be subjected to a public consultation period, whereby I&APs are given 30 days to comment.

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

The prospecting activities are dependent on the preceding phase (non-invasive). Prospecting is conducted in phases, where the activities and location of drilling are dependent on the previous phase. Therefore, the specific locations remains proposed. Mapping of prospecting activities can also not be conducted.

Due to the small extent and fairly short-term period of the prospecting activities and as shown in the Environmental Impact Assessment, the impacts will be of a low or very low significance. Rehabilitation will be conducted progressively and will include borehole capping and re-vegetation

The only rehabilitation that will specifically be required is borehole capping and revegetation:

- **Borehole capping**

Drill holes must be permanently capped as soon as is practicable

Table **33** below provides the rehabilitation plan for the proposed prospecting area.

- **Re-vegetation**

It is recommended that a standard commercial fertilizer high in the standard elements is added to the soil before re-vegetation, at a rate of 10-20kg/ha (application rate to be confirmed based on input from a suitably qualified specialist). The fertilizer should be added to the soil in a slow-release granular form.

A suitably qualified ecologist will be appointed to determine the appropriate veld grass mix for hand seeding.

Re-vegetation efforts will be monitored every second month for a period of six months after initial seeding. An effective vegetation cover of 45% must be achieved. Re-seeding will be undertaken if this cover has not been achieved after six months.

Table 33: Rehabilitation Plan

Aspect / Impact	Rehabilitation Measure	Monitoring Frequency & Responsibility
Removal of construction structures	• Clear and completely remove from site all construction plant equipment, storage containers, signage, temporary fencing, temporary services, fixtures and any other temporary works (excluding those already on the site); and • Ensure that all access roads utilised during construction (which are not earmarked for closure and rehabilitation) are returned (as far as possible) to their state prior to construction.	Once off, Ulibo Resources (Pty) Ltd
Vegetation clearing/Replanting	• Remove any emerging alien and invasive vegetation to prevent further establishment; • All planting work is to be undertaken by suitably qualified personnel making use of the appropriate equipment; • Transplant during the winter (between April and September); and • Plant indigenous plants to minimise the spread of alien and invasive vegetation.	When revegetation is done and in blooming season, Ulibo Resources (Pty) Ltd

Topsoil replacement	• Replace and redistribute stockpiled topsoil together with herbaceous vegetation, overlying grass and other fine organic matter in all disturbed areas of the prospecting site, including temporary access routes and roads. Replace topsoil to the original depth (i.e. as much as was removed prior to construction). • Prohibiting the use of topsoil suspected to be contaminated with the seed of alien vegetation .Alternatively, the soil is to be sprayed with specified herbicides. • Backfill planting holes with excavated material / approved topsoil, thoroughly mixed with weed free manure or compost (per volume about one quarter of the plant hole), one cup of 2:3:2 fertiliser and an approved ant and termite poison.	Once off, Ulibo Resources (Pty) Ltd
Waste and Rubble Removal	• Clear the site of all inert waste and rubble, including surplus rock, foundations and batching plant aggregates. • Remove from site all domestic waste and dispose of in the approved manner at a registered waste disposal site.	Once off, Ulibo Resources (Pty) Ltd

Solid & Hazardous Waste	• Environmental Management Programme (EMPR). • Dispose of all hazardous waste not earmarked for reuse, recycling or resale at a registered hazardous waste disposal site. • Remove from site all temporary fuel stores, hazardous substance stores, hazardous waste stores and pollution control sumps. Dispose of hazardous waste in the approved manner. • Do not hose oil or fuel spills into a storm water drain or sewer, or into the surrounding natural environment. • Dispose of all visible remains of excess cement and concrete after the completion of tasks. Dispose of in the approved manner (solid waste concrete may be treated as inert construction rubble, but wet cement and liquid slurry, as well as cement powder must be treated as hazardous waste).	Once off, Ulibo Resources (Pty) Ltd
Erosion protection	• Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction site. • Retain shrubbery and grass species wherever possible. • Perform regular monitoring and maintenance of erosion control measures.	After rainfall events

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

Due to the small extent and fairly short-term period of the prospecting activities and as shown in the Environmental Impact Assessment, the impacts will be of a low or very low significance. Rehabilitation will be conducted progressively and will include borehole capping and re-vegetation. Detailed mitigation measures are provided in the EMPR to ensure the closure objectives are met.

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

The quantum of the financial provision required is therefore: R49 061.00.

Table for calculations attached below.

41 Confirm that the financial provision will be provided as determined.

Ulibo Resources (Pty) Ltd herewith confirms both its capacity and willingness to make the financial provision required should the prospecting right be granted. Work will be approved on a phase-by-phase basis, dependent on the results obtained in the previous phase i.e. although prospecting work may be provided for financially in the budget for a specific year, it will only take place if justified.

Table 34: Financial Provision

CALCULATION OF THE QUANTUM

Applicant: ULIBO RESOURCES (Pty) Ltd
Evaluator: **Singo Consulting (Pty) Ltd**

Ref No.: **KZN 30/5/1/1/2/11230 PR**
Date:12-07-2

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	19	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	271	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	400	1	1	0
3	Rehabilitation of access roads	m2	300	49	1	1	14700
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	471	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	257	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	542	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0	284292	1	1	0
7	Sealing of shafts adits and inclines	m3	0	146	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0	189528	1	1	0
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	236054	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	685612	1	1	0
9	Rehabilitation of subsided areas	ha	0	158701	1	1	0
10	General surface rehabilitation	ha	0,9	150138	0,15	1	20268,63
11	River diversions	ha	0	150138	1	1	0
12	Fencing	m	0	171	1	1	0
13	Water management	ha	0	57087	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	19980	1	1	0
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum				1	0
					Sub Total 1		34968,63

1	Preliminary and General	4196,2356	weighting factor 2 1	4196,2356
2	Contingencies	3496,863		3496,863
			Subtotal 2	42661,73
			VAT (15%)	6399,26
			Grand Total	**49061**

Sign
Date 12/07/2022

42 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

Table 35: 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
Desktop studies	N/A	N/A	N/A	N/A
Geophysics	N/A	N/A	N/A	N/A
Mapping	N/A	N/A	N/A	N/A
Site establishment and drilling	Visual impact	All areas exposed will be monitored for erosion	Project Manager	Weekly and after heavy winds and rain
	Dust generated	All areas exposed will be monitored for erosion	Project Manager	Weekly and after heavy winds and rain
	Noise	All areas where machinery will be operating	Operators and Project Manager	Daily

	Water and environmental pollution	All areas of operation	Operators and Project Manager	Daily
Post closure and rehabilitation	Rehabilitated areas	All rehabilitated areas	Environmentalist	Weekly, monthly and after heavy rain

42.1 Indicate the frequency of the submission of the performance assessment/ environmental audit report

Annual performance assessments must be undertaken on the EMP. These reports must also include the assessment of the financial provision. The reports should be submitted to the DMRE.

42.2 Environmental Awareness Plan

42.2.1 Way the applicant intends to inform his or her employees of any environmental risk which may result from their work.

An Environmental Awareness and Risk Assessment Schedule have been developed and is outlined in the table below. The purpose of this schedule is to ensure that employees are not only trained but that the principles are continuously reinforced.

Table 36: Environmental Training and Awareness Schedule

Frequency	Time allocation	Objective
Induction (all staff and workers)	1-hour training on environmental awareness training as part of site induction	1. Develop an understanding of what is meant by the natural environmental and social environment and establish a common language as it relates to environmental, health, safety and community aspects. 2. Establish a basic knowledge of the environmental legal framework and consequences of non-compliance. 3. Clarify the content and required actions for the implementation of the Environmental Management Plan. 4. Confirm the spatial extent of areas regarded as sensitive and clarify restrictions. 5. Provide a detailed understanding of the definition, the method for identification and required response to emergency incidents.
Monthly Awareness Talks (all staff and workers)	30-minute awareness talks	Based on actual identified risks and incidents (if occurred) reinforce legal requirements, appropriate responses and measures for the adaptation of mitigation and/or management practices.
Risk Assessments (supervisor and workers involved in task)	Daily task-based risk assessment	Establish an understanding of the risks associated with a specific task and the required mitigation and management measures on a daily basis as part of daily toolbox talks.

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

As prescribed in the table above, Task / Issue Based Risk Assessments must be undertaken with all worker involved in the specific task in order to establish an understanding of the risks associated with a specific task and the required mitigation and management measures.

Environmental Awareness Training Content – Induction Training

The following environmental awareness training will be provided to all staff and workers who will be involved in prospecting activities.

- Description of the approved prospecting activities and content of the prospecting right;
- An overview of the applicable legislation and regulations as it relates to environmental, health, safety and community including (but not limited to):
    - General Environmental Legal Principles and Requirements
    - Air Quality Management
    - Water and Wastewater Management
    - Hazardous Substances
    - Non-Mining-Related Waste Management
    - The Appropriate Remediation Strategies & Deteriorated Water Resources
    - Biodiversity
    - Weeds and Invader Plants
    - Rehabilitation
    - Contractors and Tenants
    - Energy & Conservation
    - Heritage Resources
    - General Health and Safety Matters
    - Basic Conditions of Employment
    - Compensation for Occupational Injuries and Diseases
    - General Mine Health and Safety Matters
    - Smoking in the Workplace
    - Noise & Hearing Conservation
    - Handling, Storage and use of Hazardous Substances
    - Weapons and Firearms
- Content and implementation of the approved Environmental Management Plan
    - Allocated responsibilities and functions

  - Management and Mitigation Measures
  - Identification of risks and requirements adaptation
- Sensitive environments and features
  - Description of environmentally sensitive areas and features
  - Prohibitions as it relates to activities in or in proximity to such areas
- Emergency Situations and Remediation
  - Methodology for the identify areas where accidents and emergency situations may occur, communities and individuals that may be impacted
  - An overview of the response procedures,
  - Equipment and resources
  - Designate of responsibilities
  - Communication, including communication with potentially Affected Communities
  - Training schedule to ensure effective response.

Development of procedures and checklists

The following principles and training will apply to the Environmental Awareness Plan (safety, health and environmental (SHE) training and the Environmental Management System (EMS) training):

- All personnel, including contactors, will as a minimum undergo general SHE induction and awareness training;
- The Safety, Health, Environmental and Quality (SHEQ) Manager will identify the SHE training requirements for all personnel and contractors. The training requirements will be recorded in a training needs matrix indicating particular training that must be undertaken by identified personnel and contractors. The training matrix will be administered by the Training Department; and Development of the Training Programme, which will include:

- Job specific training – training for personnel performing tasks which could cause potentially significant environmental impacts;
- Assessment of extent to which personnel are equipped to manage environmental impacts;
- Basic environmental training;
- EMS training;

- Comprehensive training – on emergency response, spill management, etc;
- Specialised skills;
- Training verification and record keeping; and
- Periodic re-assessment of training needs, with specific reference to new developments, newly identified issues and impacts and associated mitigation measures.

General Awareness Training

- The HR Manager, together with the SHEQ Manager, will be responsible for the development of, or facilitating the development of, the required general SHE induction and awareness training. A general environmental awareness training module will be developed and integrated into the general induction programme. The general awareness
- training must include the Environmental Policy, a description of the environmental impacts and aspects and the importance of conformance to requirements, general responsibilities of personnel and contractors with regard to the environmental requirements and a review of the emergency procedures and corrective actions; and
- A Training Practitioner will conduct the general awareness training. The training presenter will keep a record of the details of all persons attending general awareness training. Such attendance registers shall indicate the names of attendants and their organisations, the date and the type of training received.

Specific Environmental Training

- Specific environmental training will be in line with the requirements identified in the training matrix; and
- Personnel whose work tasks can impact on the environment will be made aware of the requirements of appropriate procedures/work instructions. The SHEQ Manager will communicate training requirements to responsible supervisors to ensure that personnel and contractors are trained accordingly.

Training Evaluation and Re-training

- Effectiveness of the environmental training will be reflected by the degree of conformance to EMPR requirements, the result of internal audits and the general environmental performance achieved;
- Incidents and non-conformances will be assessed through the Internal Incident Investigation and Reporting System, to determine the root cause, including the possible lack of awareness/training;
- Should it be evident that re-training is required, the SHEQ Manager will inform the managers of the need and take the appropriate actions;
- General awareness training of all personnel shall be repeated every year; and
- The re-induction shall take into consideration changes made in the EMPR, changes in legislation, current levels of environmental performance and areas of improvement.

Emergency Procedures

- Emergency procedures, as relevant to this project, shall be implemented;
- The SHEQ Manager shall define emergency reporting procedures for the project;
- All personnel shall be made aware of emergency reporting procedures and their responsibilities;
- Any spills will be cleaned up immediately in accordance with relevant legislation; and
- Telephone numbers of emergency services, including the local firefighting service, shall be conspicuously displayed.

44. MANNER IN WHICH RISKS WILL BE DEALT WITH IN ORDER TO AVOID POLLUTION OR THE DEGRADATION OF THE ENVIRONMENT

There are several ways to avoid and minimise pollution, including environmental awareness, training, dust suppression, buffer zones, hunting avoidance and veld fire prevention.

Environmental awareness and training	Drilling teams must be trained and any other person who will be based on-site or come to site for the prospecting project must be briefed and inducted on site regulations, especially with regard to health, safety and environmental aspects.
Dust suppression	During construction, preparation and drilling, dust suppression must be exercised on the roads, drill holes and areas being excavated. The right amount of water must be applied to get the desires results.
Buffer zone	Roads, railway lines, water ways, ponds, rivers and wetlands must be avoided to minimise negative impact. Establishing a minimum buffer zone of 100 m around such a feature will reduce pollution and destruction thereof.
Avoid hunting	Hunting of any animals on site will be strictly prohibited
Avoid veld fires	Veld fires will not be permitted, as they easily get out of control and can destroy vegetation, livestock and property.

45. Specific information required by the Competent Authority

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

No specific information has been required by the Competent Authority at this point in time.

46. UNDERTAKING

The EAP herewith confirms

a) the correctness of the information provided in the reports
b) the inclusion of comments and inputs from stakeholders and I&APs ;
c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
d) 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:

Singo Consulting (Pty) Ltd

Name of company:

Date: 15/07/2022

-END-

Appendix 1: Acceptance Letter

mineral resources & energy
Department:
Minerals Resources and Energy
REPUBLIC OF SOUTH AFRICA

Private Bag X 54307, Durban, 4000, 333 Anton Lembede Street, 3rd Floor Durban Bay House, Durban, Tel (031) 335 9600, Fax (031) 305 5801
Reference: KZN30/5/1/1/2/11230PR Enquiries: Mr. Sandile. Njapha Email address: Sandile.njapha@dmre.gov.za,

REGISTERED MAIL

THE MANAGER
ULIBO RESOURCES (PTY) LTD
PRIVATE BAG X7297
EMALAHLENI (WITBANK)
HIGHVELD MALL
1035

Dear Sir/Madam

ACCEPTANCE OF AN APPLICATION FOR PROSPECTING RIGHT IN TERMS OF SECTION 16(4) OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002)

1. Please be informed that your application for Prospecting of Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial), Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, Zinc Ore on a Portion of Portion 1 of the Farm Simdlangentsha No. 16956-HU and the Farm Bongasspoort No. 16930-HU situated in the Magisterial District of Zululand is hereby accepted on the above-mentioned properties, in terms of section 16 (2) of the Act,

2. ***You are further directed to consult with QFM Projects (Pty) Ltd on 081 287 4763, in respect to of the above properties, since there is an accepted prospecting right for coal on the same properties applied for and furnish the Department with the result on or before 06th July 2022.***

3. Take note that in light of the minimum requirements as stipulated on regulation 16 (1) and 16 (2) of the EIA Regulations, your application for an Environmental Authorisation was deemed incomplete as it was not accompanied by this acceptance letter as per Regulation 16 (1) (ix) and considering that it is now

: KZN30/5/1/1/2/11230PR
Acceptance of an application for prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, (Act 28 Of 2002) to prospect for Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial), Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, Zinc Ore on a portion of portion 1 of the Farm Simdlangentsha No. 16956-HU and the Farm Bongasspoort No. 16930-HU situated in the Magisterial District of Zululand: Ulibo Resources (Pty) Ltd. S.N

completed by this acceptance letter, you are hereby required to submit the documents as stipulated on Regulation 19 (1) to 19 (8) of the EIA Regulation (only in cases where Basic Assessment Report is applicable or Regulation 21 (Scoping Report and Regulation 23 (Environmental Impact Report) (only in cases where applicable). All submission timeframes are effective from the dates of this acceptance letter.

4. Please take further note that in terms of section 16 (4) of the Act, you are required to: -

4.1 Upload unto the SAMRAD system one copy and submit three (03) hard copies of the requisite environmental reports as required by section 16 of the MPRDA within ninety (90) days from the date of this letter. **(29th September 2022).**

4.2 To consult in the prescribed manner with the landowner, lawful occupier and any interested and affected party including the Land Restitution Commission and include the result of such consultation in the relevant environmental reports to be submitted and uploaded on the SAMRAD system on or before **06th July 2022 (within 30 days from the date of this letter)**

Please note that the consultation process referred to in paragraph 2.2 above does not imply issuing letters and requesting the affected parties to indicate whether they support your proposed project or not.

It includes among others an extensive process of giving and discussing the specific details of the proposed project, giving the I & A Parties an opportunity to table their comments, objection and support, it also involves ***your written responses and specific commitments made*** *in dealing with the issues raised during the consultation.*

Note that it is important to ensure that your consultation process is comprehensive so that your Environmental Impact Assessment and Environmental Management Plan can be informed by all potential impacts that your project may have.

5. Should the land be owned by the communities or a Trust on behalf of the community, a proper and thorough consultation process must be engaged upon and a legitimate Tribal Resolution or consent must be obtained from the Traditional

: KZN30/5/1/1/2/11230PR
Acceptance of an application for prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, (Act 28 Of 2002) to prospect for Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial), Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, Zinc Ore on a portion of portion 1 of the Farm Simdlangentsha No. 16956-HU and the Farm Bongasspoort No. 16930-HU situated in the Magisterial District of Zululand: Ulibo Resources (Pty) Ltd. S.N

Authority / Council or Trust and be submitted with the results of consultation. *Should you need any assistance or guidance relating to the required consultation process & procedure in traditional institutions, please contact the District office of the Department of Cooperative Governance and Traditional Affairs in* ***Zululand District Municipality.***

6. Further note that the acceptance of your application does not grant you the right to commence with **prospecting activities**. It only signifies that your application will be processed and evaluated. The Minister or his delegate will make a decision once the process of the evaluation and appeal on the Environmental Authorization application has been finalized.

7. You are in terms of Section 17(1) of the Act required to give effect to the objects referred to in Section 2 (d) of the Act. Therefore please submit on or before **18th August 2022 (within 60 days from the date of this letter)** to this office for the attention of Regional Manager any documentation proving such including but not limited to:-

7.1 Duly signed shareholders agreements with your empowerment partner in which provision **shall** be made for entrepreneurs, local community and employees,
7.2 Share certificates,
7.3 Details relating to the equity by the BEE shareholders, Any other agreement relating to the BEE shareholding including the voting pool agreement where applicable,
7.4 Articles and memorandum of association of the company.
7.5 Any other information that may be necessary to explain and serve as evidence that the applicant meets the appropriate HDSA ownership and/or compliance requirements of the aforesaid Act and Mining Charter.

8. Please submit within 60 days **(18th August 2022)** from date of this letter for the attention of Regional Manager a complete prospecting work programme prepared in terms of Regulation 7 of the Mineral and Petroleum Resources Development Act, 2002 (Act no 28 of 2002): Mineral and Petroleum Development Regulation.

9. You are also required to adhere with the requirements of Mine Health and Safety Inspectorate and upload on system the required information and details on or before **06th July 2022 (within 30 days from the date of this letter)**

: KZN30/5/1/1/2/11230PR
Acceptance of an application for prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, (Act 28 Of 2002) to prospect for Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial), Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, Zinc Ore on a portion of portion 1 of the Farm Simdlangentsha No. 16956-HU and the Farm Bongasspoort No. 16930-HU situated in the Magisterial District of Zululand: Ulibo Resources (Pty) Ltd. S.N

10. Please be advised that your application might be processed in terms of section 9 (1) (b) of the Act. If this office discovers that there is an existing or pending application on the same properties and for the same mineral, this application shall discontinue.

11. Please take note that failure to adhere to the timeframe stipulated above and to submit any documentation required in terms of this notice will result into non-compliance with the provision of the Act and the Amendment Act and will result in the refusal of your application.

Yours faithfully

REGIONAL MANAGER
KWAZULU NATAL REGION
DATE: 24/05/2022

: KZN30/5/1/1/2/11230PR

Acceptance of an application for prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, (Act 28 Of 2002) to prospect for Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial), Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, Zinc Ore on a portion of portion 1 of the Farm Simdlangentsha No. 16956-HU and the Farm Bongasspoort No. 16930-HU situated in the Magisterial District of Zululand: Ulibo Resources (Pty) Ltd. S.N

Appendix 2: Basic Studies

PROSPECTING RIGHT APPLICATION

BASIC SOIL, LAND USE AND LAND CAPABILITY STUDY

Basic Soil, Land Use and Land Capability Study for the proposed Prospecting Right Application within portion of portion 1 of the farm Simdlangentsha 15956 HU and the whole extent of the farm Bongaspoort 16930 HU , in the Magisterial District of Simdlangentsha, KwaZulu natal Province

REPORT PREPARED BY:

Singo Consulting (Pty) Ltd

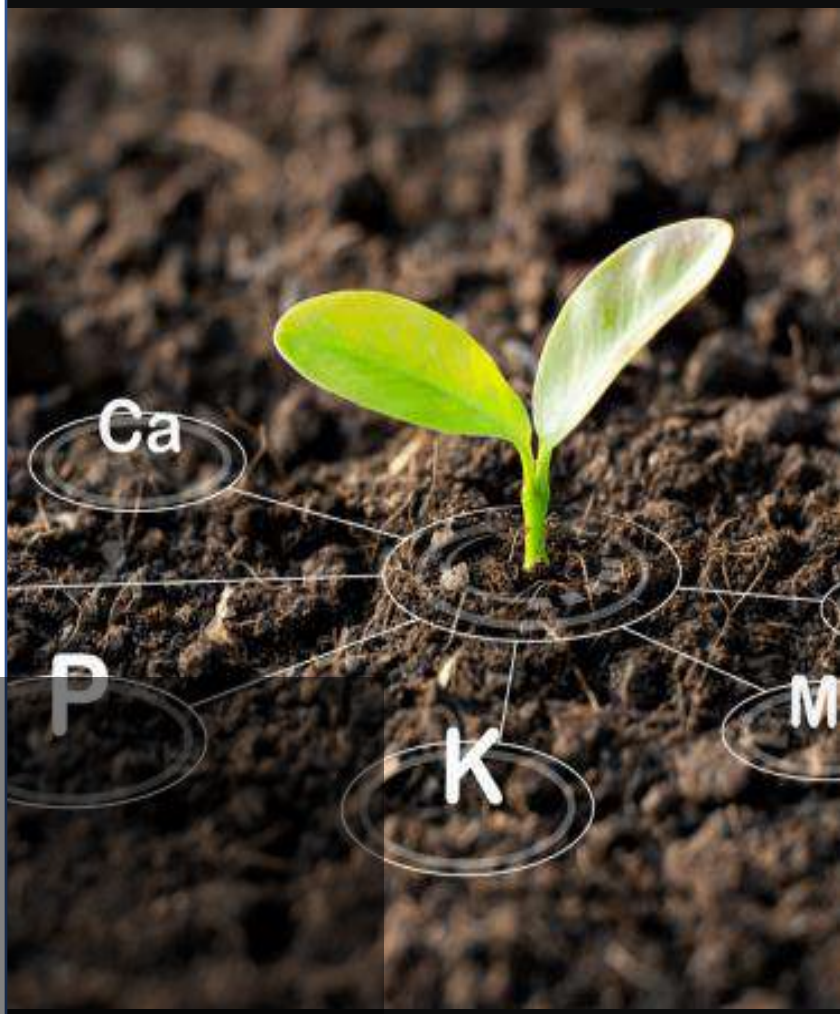
Address: Office No. 870, 5 Balalaika Street, Tasbet Park Ext 2, Witbank, 1040.

Contact Details: Tell No.: 013 692 0041

Cell No.: 072-081-6682/078-2727-839

Fax No.: 086-514-4103

E-mail: kenneth@singoconsulting.co.za



ULIBO RESOURCES (Pty) Ltd
Reg Nr: 2013/099506/07

DMRE REF: (DMRE Ref: KZN 30/5/1/1/2/11230 PR)

Report Credentials.

Disclaimer

The opinion expressed in this and associated reports are based on the information provided by Ulibo Resources(Pty) Ltd to Singo Consulting (Pty) Ltd ("Singo Consulting") and is specific to the scope of work agreed with Ulibo Resources(Pty) Ltd. Singo Consulting acts as an advisor to the Ulibo Resources(Pty) Ltd and exercises all reasonable skill and care in the provision of its professional services in a manner consistent with the level of care and expertise exercised by members of the environmental profession. Except where expressly stated, Singo Consulting has not verified the validity, accuracy or comprehensiveness of any information supplied for its reports. Singo Consulting shall not be held liable for any errors or omissions in the information given or any consequential loss resulting from commercial decisions or acts arising from them. Where site inspections, testing or fieldwork have taken place, the report is based on the information made available by Ulibo Resources (Pty) Ltd or their nominees during the visit, visual observations and any subsequent discussions with regulatory authorities. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Singo Consulting is both complete and accurate. It is further assumed that normal activities were being undertaken at the site on the day of the site visit(s), unless explicitly stated otherwise. These views do not generally refer to circumstances and features that may occur after the date of this study, which were not previously known to Singo Consulting (Pty) Ltd or had the opportunity to assess.

Office No. 870, 5 Balalaika Street, Tasbet Park Ext 2, Witbank, 1035.
Tell No.: 013 692 0041 Cell No.: 072-081-6682/078-2727-839 Fax No.: 086-514-4103 E-mail address: kenneth@singoconsulting.co.za

Project details

Report type	**Basic Soil, Land Use and Land Capability Study for a Prospecting Right application**
Project title	Basic Soil, Land Use and Land Capability Study for the proposed Prospecting Right application portion of portion 1 of the farm Simdlangentsha 15956 HU and the whole extent of the farm Bongaspoort 16930 HU, in the Magisterial District of Simdlangentsha, KwaZulu natal Province
Mineral (s)	Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial). Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, Zinc Ore
Client	Ulibo Resources (Pty) Ltd
Site location	Portion of portion 1 of the farm Simdlangentsha 15956 HU and the whole extent of the farm Bongaspoort 16930 HU, in the Magisterial District of Zululand, KwaZulu natal Province, South Africa
Version	1
Date	01 June 2022

		Electronic signatures
Compiled by	Mutali Guduvheni (Hydrogeologist) Singo Consulting (Pty) Ltd, South African Council for Natural Scientific Professions (SACNASP: Earth Science (Candidate Natural Scientist) Reg. No: 141174)	
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Final review and approval	Dr. Kenneth Singo (Principal Consultant of Singo Consulting (Pty) Ltd)	

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Table 1: Critical Report Information

Critical Information incorporated within the Basic Soil, Land Use and Land Capability Study:	Relevant section in report
Details of the specialist who prepared the report	Appendix A, P: 30
The expertise of that person to compile a specialist report including a curriculum vitae	Appendix A. P: 30
Project Background Information, including the proposed activities description	Chapter 1, P: 6
An indication of the scope of, and the purpose for which, the report was prepared	Chapter 1, P: 6
An indication of the quality and age of base data used for the specialist report	Chapter 2, P; 6
A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Chapter 5, P; 26
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	
A description of the methodology implemented in preparing the report or carrying out the specialised process comprehensive of equipment and modelling used;	Chapter 3, P; 7
Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternative;	Chapter 4, P; 19
An identification of any areas to be avoided, including buffers	Chapter 5; P: 26
A map overlaying the proposed activity including the associated infrastructures on the environmental sensitivities of the site including containing buffer zones	Chapter 4; P: 15
A description of the findings and potential implications of such findings on the impact of the proposed activity or activities	Chapter 5, P; 26
Any mitigation and conditions measures for inclusion in the EMPr	Chapter 7; P: 29
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Chapter 7; P 29
An analytic opinion as to whether the proposed activity or portions thereof should be Authorised-i.e. specific recommendations	Chapter 7; P: 29
Regarding the acceptability of the proposed activity or activities; and	-
If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Chapter 6; P 28
A description of any consultation process that was undertaken during carrying out the study	-
Any other information requested by the competent authority.	-

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1 INTRODUCTION

1.1 Project Background Information

Singo Consulting (Pty) Ltd was appointed Ulibo Resources (Pty) Ltd to conduct a basic soil study for the Prospecting Right Application which has been submitted for the prospecting of Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial). Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, Zinc Ore located on portion of portion 1 of the farm Simdlangentsha 15956 HU and the whole extent of the farm Bongaspoort 16930 HU , in the Magisterial District of Zululand, KwaZulu natal Province, South Africa.

The main aim of conducting this study is to find information with regards to the soil potential, current land use as well as land capability.

This report is not planned to be an intensive description of the proposed project; however, it is conducted as a specialist basic soil study to evaluate the soil potential, current land use as well as land capability information required for the environmental authorizations for the proposed prospecting project.

1.2 Scope of Work

The scope of work included the following:

- Conduct a basic soil assessment of the proposed prospecting right project.
- Determine impacts of the proposed prospecting activities of Manganese Ore, Copper ore, Tin ore, Iron Ore, Nickel Ore, Zinc ore, Rare Earths and Magnesite, Diamond, Cobalt, Diamonds (alluvial) on soil and provide associated mitigation measures.
- Classify and map soil forms according to the South African Taxonomic Soil Classification System, 1991.
- Derive and map land capability based on soil properties.
- Map all current land uses.

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2 TERMS OF REFERENCE

The following tasks were undertaken in the compilation of the soil assessment, land use and land capability study:

2.1 Basic Soil Study

- A basic soil assessment of the proposed project development footprint areas associated within the proposed Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial). Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, Zinc Ore prospecting site.
- The soil classification will be done according to the Taxonomic Soil Classification System for South Africa, 1991. The following attributes were included at each observation:
  - Soil form and family
  - Soil depth
  - Estimated soil texture
  - Soil structure
  - Underlying material
  - Current land use
  - Land capability

3 METHODOLOGY

3.1 Desktop study and literature review

This allows soil surveyors to enter and study colour, texture, structure, and other soil properties as well to differentiate between horizons. This allows for classification. Chemical tests can be carried out in the field (e.g., pH, test for carbonates and test for Mn oxides). Classification is done at this stage, which provides information on the chemical, physical and mineralogical characterization of the soil. Soil scientists that map the area, familiarize themselves with soils they expect to find and use characteristics to distinguish them from other soils in the area by doing desktop study.

3.2 Site Assessment

The soil on portion of portion 1 of the farm Simdlangentsha 15956 HU and the whole extent of the farm Bongaspoort 16930 HU , in the Magisterial District of Simdlangentsha, KwaZulu natal Province, South Africa were investigated by means of conducting auger drilling. The holes

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were drilled up to 23cm below ground level. The soil was described and classified according to the South African Taxonomic Soil Classification System.

3.3 Environmental Impact Assessment

The impact rating process is designed to provide a numerical rating of the various environmental impacts identified using the Input-Output model. It must be emphasized that the purpose of this process is not to provide an incontrovertible rating of the significance of various aspects, but rather to provide a structured, traceable, and defendable methodology of rating the relative significance of impacts in a specific context. This provides the project proponent a greater understanding of the impacts of this project and the issues which need to be addressed by mitigation and give the regulators information on which to base their decisions on.

The significance rating process follows the established impact/risk assessment formula:

Significance= Consequence x Probability

Where

Consequence = Severity + Spatial Scale + Duration

Probability = Likelihood of an impact occurring

The matrix calculates the rating out of 147, whereby Severity, Spatial Scale, Duration and Probability are each rated out of seven as indicated in Table 1. Weighting can be applied to the various parameters. Impacts are rated prior to mitigation and again after consideration of the mitigation measure proposed in the Environmental Management Plans (EMP). The significance of an impact is then determined and categorized into one of four categories, as indicated in Table 2, which supports Table 3. Environmental management actions will be assigned for all identified impacts. A neutral impact implies that it causes the area to return to a pre-project state. This is not regarded as positive, as there would have been no need for this activity if the operation were not carried out.

Table 2: Impact assessment parameter ratings

Rating	Severity		Spatial scale	Duration	Probability
	Environmental	Social, cultural and heritage			
7	Very significant impact on the environment. Irreparable damage	Irreparable damage to highly valued items of great cultural significance	International The effect will occur across	Permanent: No Mitigation No mitigation measures of	Certain/Definite. The impact will occur regardless of the

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	to highly valued species, habitat or eco system. Persistent severe damage	or complete breakdown of social order.	international borders	natural process will reduce the impact after implementation	implementation of any preventative or corrective actions.
6	Significant impact on highly valued species, habitat or ecosystem	Irreparable damage to highly valued items of cultural significance or breakdown of social order.	National Will affect the entire country	Permanent: Mitigation measures of natural process will reduce the impact	Almost certain/Highly probable It is most likely that the impact will occur
5	Very serious, long term environmental impairment of ecosystem function that may take several years to rehabilitate	Very serious widespread social impacts. Irreparable damage to highly valued items.	Province/ Region Will affect the entire province or region	Project Life The impact will cease after the operational life span of the project	Likely The impact may occur
4	Serious medium term environmental effects. Environmental damage can be reversed in less than a year	On-going serious social issues. Significant damage to structures / items of cultural significance	Municipal Area Will affect the whole municipal area	Long term 6-15 years	Probable Has occurred here or elsewhere and could therefore occur
3	Moderate, short-term effects but not affecting ecosystem function. Rehabilitation requires intervention of external specialists and can be done in less than a month	On-going social issues. Damage to items of cultural significance. Local	Local Local extending only as far as the development site area	Medium term 1-5 years	Unlikely Has not happened yet but could happen once in the lifetime of the project, therefore there is a possibility that the impact will occur

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2	Minor effects on biological or physical environment. Environmental damage can be rehabilitated internally with/ without help of external consultants	Minor medium-term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Limited Limited to the site and its immediate surroundings	Short term Less than 1 year	Rare/ improbable Conceivable, but only in extreme circumstances and/ or has not happened during lifetime of the project but has happened elsewhere. The possibility of the impact materializing is very low as a result of design, historic experience or implementation of adequate mitigation measures
1	Limited damage to minimal area of low significance, (e.g., ad hoc spills within plant area). Will have no impact on the environment.	Low-level repairable damage to commonplace structures	Very limited Limited to specific isolated parts of the site.	Immediate Less than 1 month	Highly unlikely/None Expected never to happen

According to the Impact assessment parameter ratings in Table 2, the rating of the proposed area is classified as 3, since there will be a moderate, short-term effects on the environment but not affecting the ecosystem function. Rehabilitation will require intervention of external specialists and can be done in less than a month. The spatial scale of the impact is the Local area, the impact can extend only as far as the development site area. The Likelihood of an impact to occur is unlikely but there is a possibility that the impact will occur once the project has started. The duration of the impact can last between 1- 5 years.

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Table 3: Probability Consequence Matrix

Significance		Consequence (severity + scale + duration)								
		1	3	5	7	9	11	15	18	21
Probability / Likelihood	1	1	3	5	7	9	11	15	18	21
	2	2	6	10	14	18	22	30	36	42
	3	3	9	15	21	27	33	45	54	63
	4	4	12	20	28	36	44	60	72	84
	5	5	15	25	35	45	55	75	90	105
	6	6	18	30	42	54	66	90	108	126
	7	7	21	35	49	63	77	105	126	147

Table 4: Impact significance threshold limits

Significance		
Low	**0 – 35**	
Low-Medium	**36 – 76**	
Medium- High	**73 – 107**	
High	**108 - 147**	

3.4 Land capability classification

The Land capability classification is one of several interpretation groups that was made for agricultural purposes. As with all the interpretation groups, the land capability classification starts with one soil-mapping unit, which is the building block of the system.

The land capability is classified into grazing, arable and wilderness. In this classification the arable soils are grouped according to their potentialities and limitations for sustained production of the common cultivated crops that do not require specialized site conditioning or site treatment. Nonarable soils (soils unsuitable for long time sustained use for cultivated crops) are grouped according to their potentialities and limitations to produce permanent vegetation and according to their risks of soil damage if mismanaged.

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4 PHYSIOGRAPHICAL AND SOIL SETTING

4.1 Project Location

The locality map created by the QGIS illustrates the location of the proposed area, it is situated on portion of portion 1 of the farm Simdlangentsha 15956 HU and the whole extent of the farm Bongaspoort 16930 HU, in the Magisterial District of Simdlangentsha, KwaZulu natal Province. The project site as seen in *Figure 1* shows the area is approximately 18.13 km north of Louwburg and roughly 32.9 km west of Pongola and about 23,6 km South-West of Belgrade. Accessed via N2.

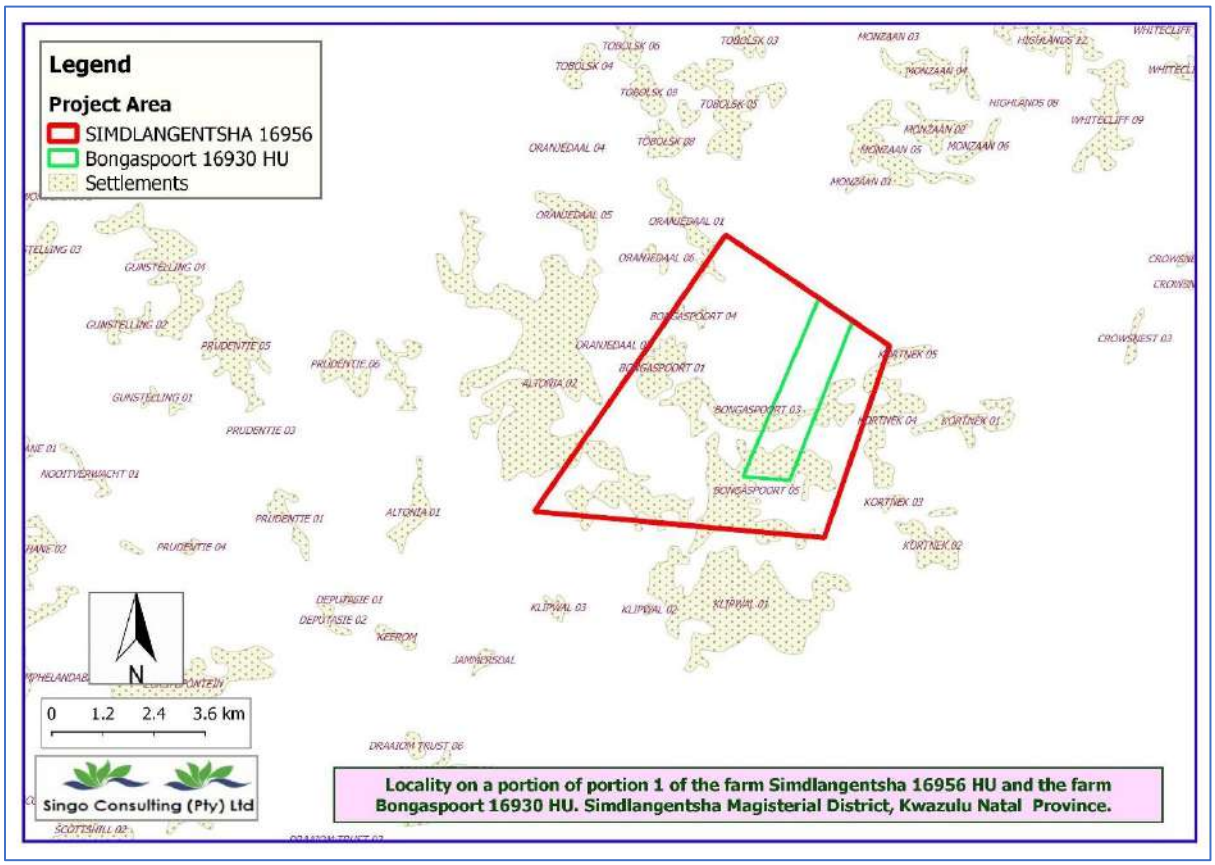

Figure 1: Locality map of the study area

4.2 Climate

Simdlangentsha is in the southern hemisphere, with summer months being December, January, February, March. The month with the highest relative humidity is February (71.64 %). The month with the lowest relative humidity is August (56.53 %). The month with the highest number of rainy days is December (15.43 days). The month with the lowest number of rainy days is June (2.13

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days). The climate is warm and temperate in Simdlangentsha, and the Köppen-Geiger climate classification is Cwa. The average temperature in Simdlangentsha is 20.2 °C. The annual rainfall is 806 mm. and mean minimum annual temperature of 4.1 – 6 °C.

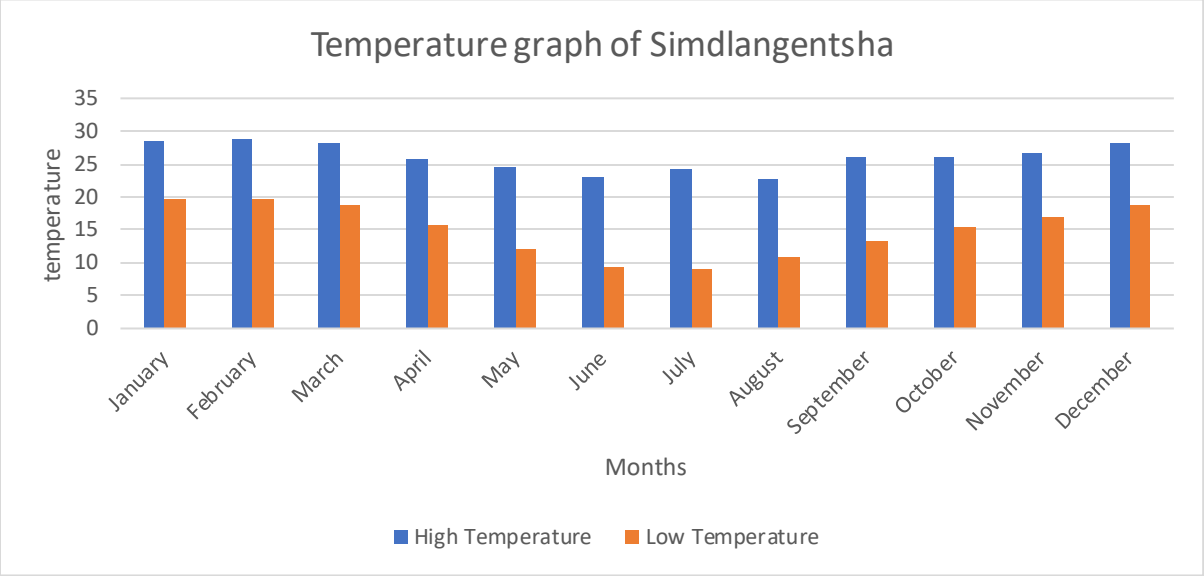

Figure 2: Temperature graph at Simdlangentsha

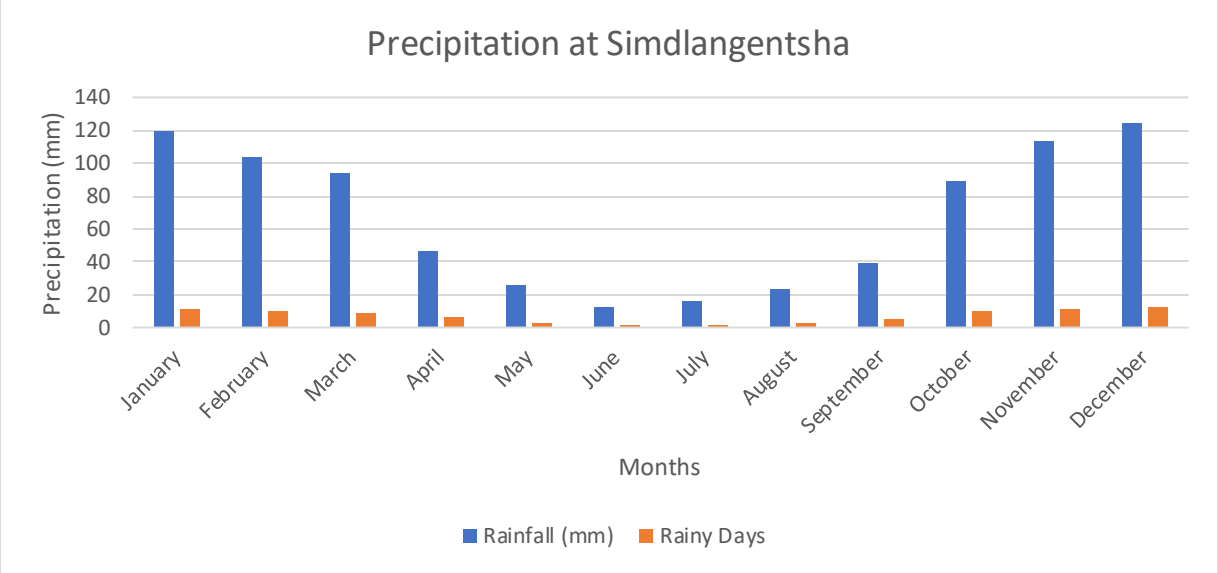

Figure 3: Precipitation graph at Simdlangentsha

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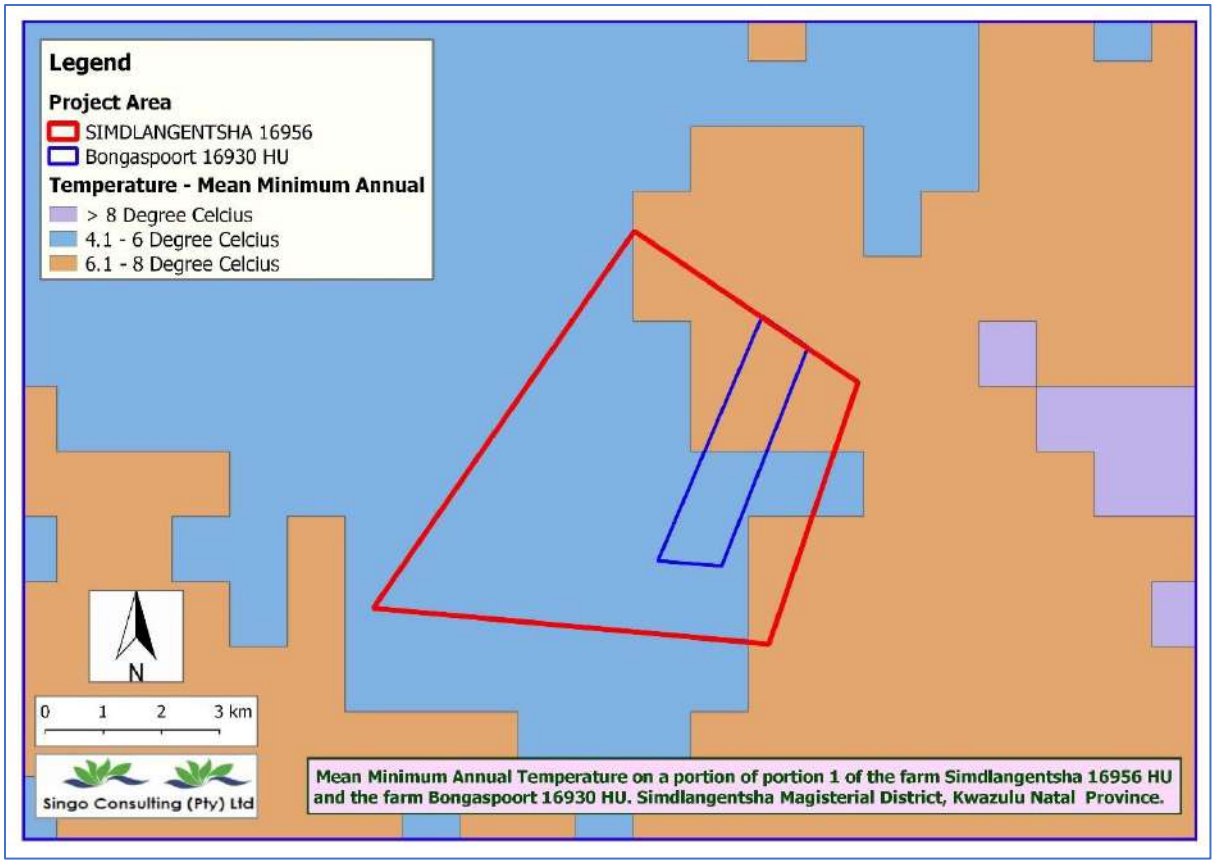

Figure 4: Mean minimum annual Temperature Map

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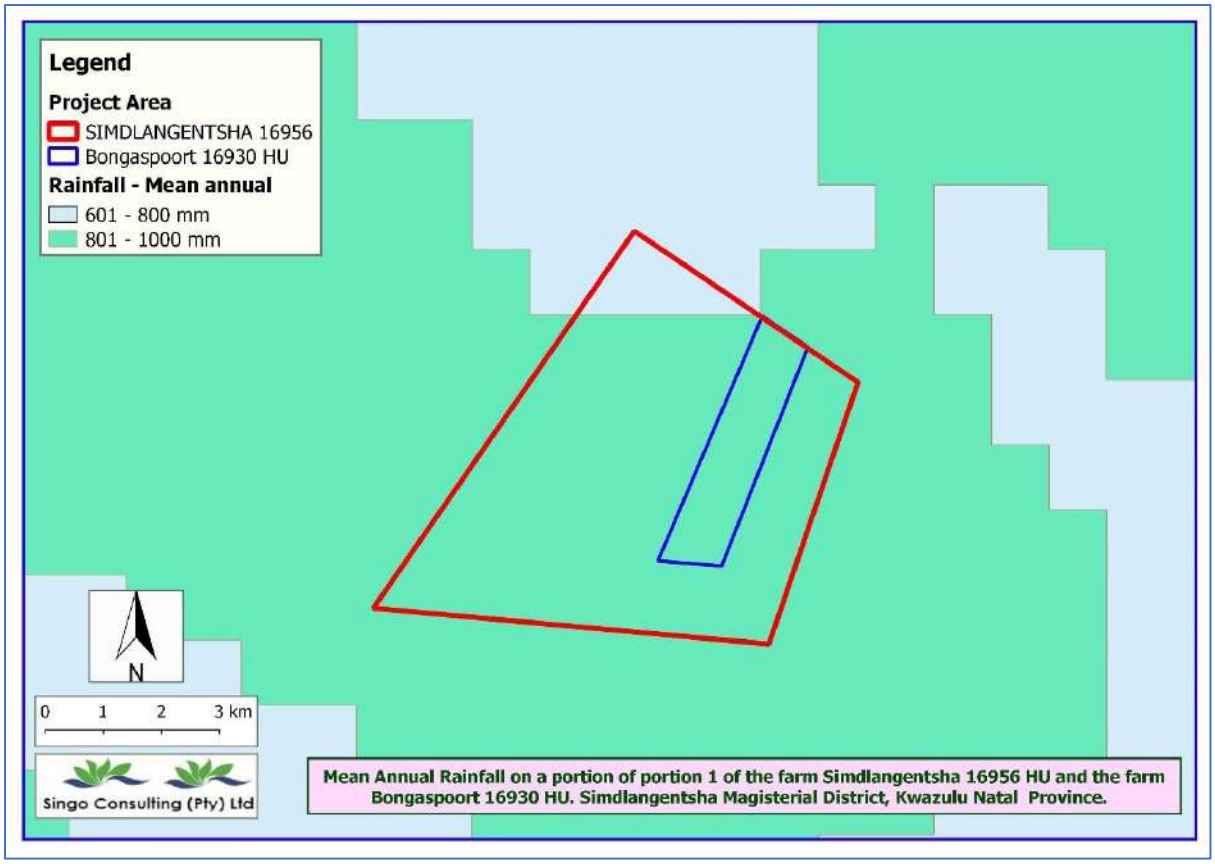

Figure 5: Mean Annual Rainfall Map

4.3 Soil Classes present in the study area

The soil classes map in Figure 6 below, shows that the prospecting right area is largely covered with Association of Classes 13 and 16: Undifferentiated shallow soils, Association of Classes 1 to 4: Undifferentiated structureless soils, and land classes Red or yellow structureless soils with a plinthic horizon.

The Favourable properties of **Association of Classes 13 and 16: Undifferentiated shallow** soils are that the soil may receive water runoff from associated rock; water-intake areas. The soil has Restricted land use options.

Solum depth is less than 50 cm in shallow soils. They usually have a thin A horizon over the parent material or bedrock. The total depth of the A and B horizons does not exceed 50 cm if there is a B horizon beneath the A horizon. Moderately deep soils have a solum depth of 50–100 cm, whereas deep soils have a solum depth of greater than 100 cm. High Mountain and valley soils are typically quite shallow and devoid of considerable topsoil. They are easily eroded. Earlier soil classification systems referred to such shallow soils on bedrock as Lithosols.

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The **Association of Classes 1 to 4: Undifferentiated structureless soils** can be defined based on their soil depth, Soil Drainage and erodibility.

Soil depth

Depth of the soil profile is from the top to the parent material or bedrock. This type of soil can be classified as a restricted soil depth. A restricted soil depth is a nearly continuous layer that has one or more physical, chemical, or thermal properties.

Soil Drainage

Soil drainage is a natural process by which water moves across, through, and out of the soil because of the force of gravity. The soils in the proposed area have an excessive drainage due to the soils having very coarse texture. Their typical water table is less than 150.

Erodibility

Erodibility is the inherent yielding or non-resistance of soils and rocks to erosion. The freely drained structureless soils have high erodibility. A high erodibility implies that the same amount of work exerted by the erosion processes lead to a larger removal of material.

Red or yellow structureless soils with a plinthic horizon

Red apedal soils

These soils have a structure that is weaker than moderate blocky or prismatic in the moist state, if structure is borderline, CEC (NH4OAc, pH7) per kg soil is less than 11cmol (+)/kg soil. These soils are non-calcareous in any part of the horizon which occurs within 1500mm of the soil surface but may contain infrequent, discrete, relict lime nodules in a non-calcareous soil matrix. It does not have alluvial or aeolian stratifications. The B horizons that have uniform colours, falling within the range defined as red and that in the moist state, lack well-formed peds other than porous micro-aggregates, qualify as red apedal. The concept of these macroscopically weakly structured or structureless materials embraces that kind of weathering that takes place in a well-drained oxidizing environment to produce coatings of iron oxides on individual soil particles (hence the diagnostic red colours) and clay minerals dominated by non-swelling 1:1 type.

Yellow apedal soil

This horizon does not have grey colours in the dry state as defined for the E horizon. Although colour must be substantially uniform, some variability is permitted, for example mottles or concretions which are insufficient to qualify the horizon as a diagnostic plinthic B, faunal reworking may also result in acceptable colour variegations. It is non-calcareous within any part of the horizon which occurs within 1500mm of the surface but may contain infrequent,

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discrete, relict lime nodules in a non-calcareous soil matrix. Does not have alluvial or aeolian stratifications., directly underlies a diagnostic topsoil horizon or an E horizon. Yellow- brown apedal B horizons occur over approximately the same climatic spread as their red counterparts and so are also very widely distributed throughout the country. They may be found on all types of parent material.

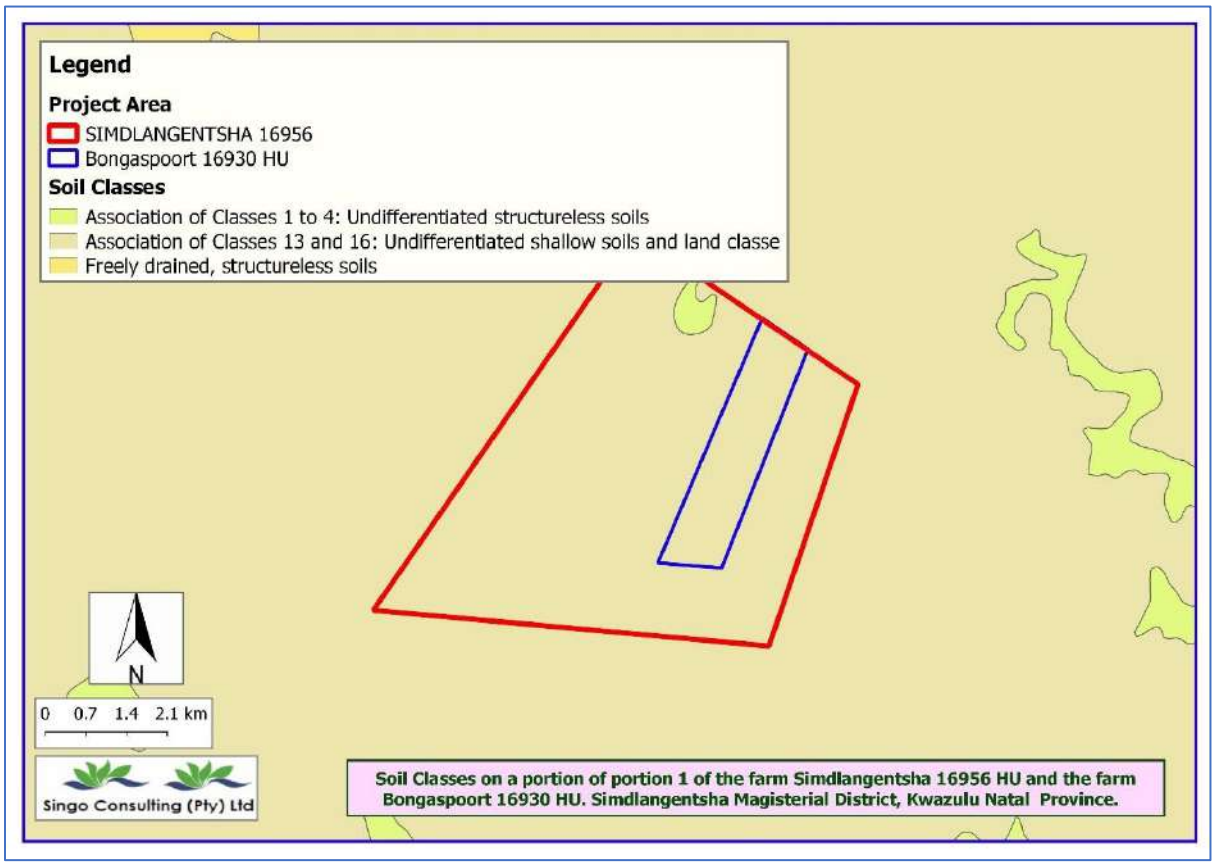

Figure 6: soil class map of the project area.

4.4 Land use

Figure 7 below is a map of the land uses found in the area. The prospecting right area is covered with plantations, natural vegetation, cultivated land, uncategorized land, and Built-up land.

4.4.1 Cultivated Land

Cultivated land is the area of land that are ploughed and/or prepared for raising crops (excluding timber production). It includes areas currently under crop, or land being prepared.

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4.4.2 Natural Vegetation

Natural vegetation refers to a plant community, which has grown naturally without human aid and has been left undisturbed by humans for a long time.

4.4.3 Wetlands

A wetland is a separate habitat that is permanently (for years or decades) or seasonally flooded by water (for weeks or months). Flooding causes oxygen-free (anoxic) processes to predominate, particularly in soils.

4.4.4 Mines

A hole or tunnel drilled/ dug into the earth to retrieve metal or minerals. A surface excavation is one in which the earth's topmost or exposed layer is removed in order to obtain its ore or minerals.

4.4.5 Plantations

A plantation is a large-scale estate, generally centered on a plantation house, meant for farming that specializes in cash crops. The crops that are grown include cotton, coffee, tea, cocoa, sugar cane, opium, sisal, oil seeds, oil palms, fruits, rubber trees and forest trees.

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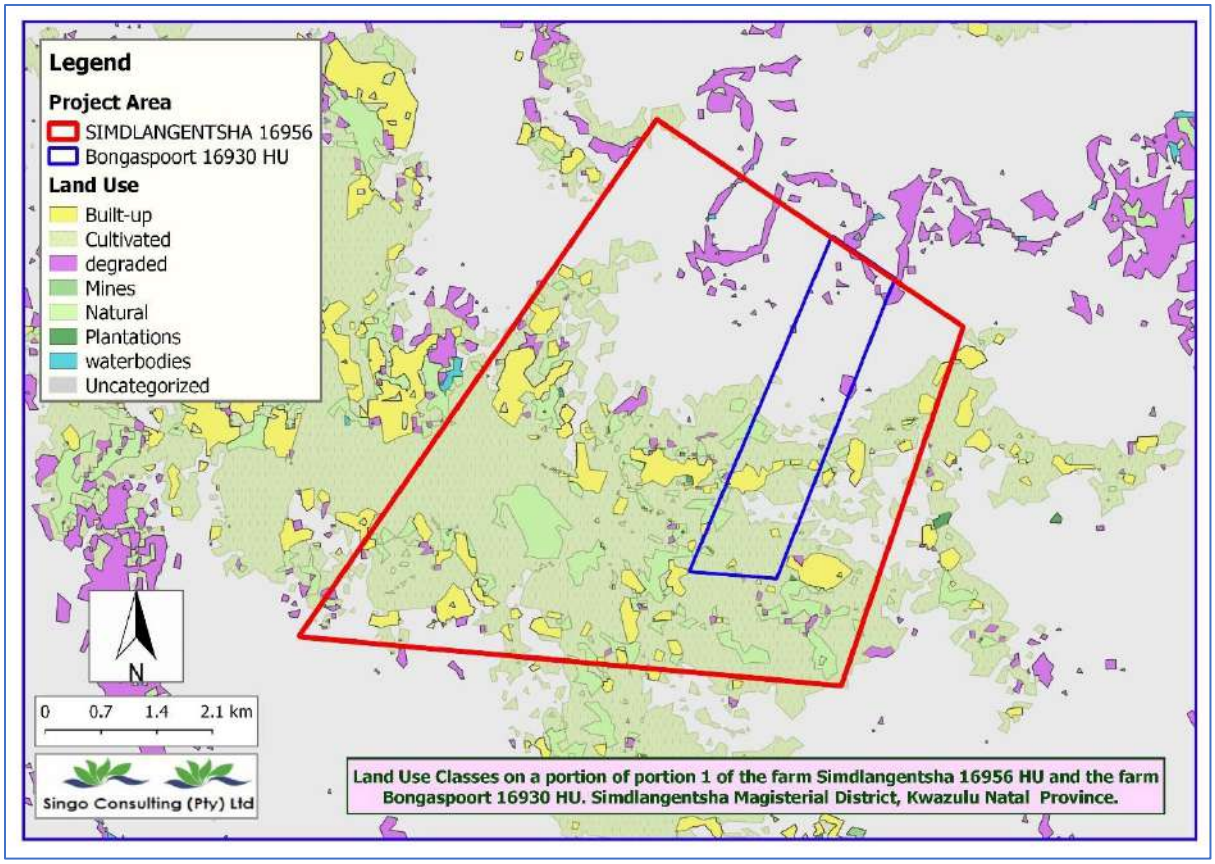

Figure 7: Land use and land cover map.

4.5 Land capability

The Land capability classification is one of several interpretation groups that was made for agricultural purposes. As with all the interpretation groups, the land capability classification starts with one soil-mapping unit, which is the building block of the system.

The land capability is classified into grazing, arable and wilderness. In this classification the arable soils are grouped according to their potentialities and limitations for sustained production of the common cultivated crops that do not require specialized site conditioning or site treatment. Nonarable soils (soils unsuitable for long time sustained use for cultivated crops) are grouped according to their potentialities and limitations to produce permanent vegetation and according to their risks of soil damage if mismanaged. The land capability of the proposed area is classified as grazing land and arable land. Arable land is any land capable of being ploughed and used to grow crops and Wilderness are natural environments on Earth that have not been significantly altered by human activity, or any nonurbanized land

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that has not been extensively cultivated by agriculture. Figure 8 shows that the proposed area has grazing potential.

The capability grouping of soils is designed:

0. to help landowners and others use and interpret the soil maps,
1. to introduce users to the detail of the soil map itself, and
2. to make possible broad generalizations based on soil potentialities, limitations in use, and management problems.

The capability classification provides three major categories of soil groupings:

0. Capability unit,
1. capability subclass, and
2. capability class.

The first category, capability unit, is a grouping of soils that have about the same responses to systems of management of common cultivated crops and pasture plants. Soils in any one capability unit are adapted to the same kinds of common cultivated and pasture plants and require similar alternative systems of management for these crops. Long-time estimated yields of adapted crops for individual soils within the unit under comparable management do not vary more than about 25 percent.

The second category, the subclass, is a grouping of capability units having similar kinds of limitations and hazards. Four general kinds of limitations or hazards are recognized: (1) Erosion hazard, (2) wetness, (3) rooting zone limitations, and (4) climate.

The third and broadest category in the capability classification places all the soils in eight capability classes. The risks of soil damage or limitations in use become progressively greater from class I to class VIII. Soils in the first four classes under good management can produce adapted plants, such as forest trees or range plants, and the common cultivated field crops ^ and pasture plants. Soils in classes V, VI, and VII are suited to the use of adapted native plants. Some soils in classes V and VI are also capable of producing specialized crops, such as certain fruits and ornamentals, and even field and vegetable crops under highly intensive management involving elaborate practices for soil and water conservation. Soils in class VIII do not return on-site benefits for inputs of management for crops, grasses, or trees without major reclamation.

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The grouping of soils into capability units, subclasses, and classes is done primarily based on their capability to produce common cultivated crops and pasture plants without deterioration over a long period of time. To express suitability of the soils for range and woodland use, the soil mapping units are grouped into range sites and woodland-suitability group.

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Table 5: Relationship of soil-mapping unit to capability classification (Source: (KELLOGO, 1961))

Soil-mapping unit	Capability unit	Capability subclass	Capability class
A soil mapping unit is the part of the landscape' that has the same qualities and characteristics and whose limits are static by accurate definitions. Within the cartographic limitations and considering the purpose for which the map is made, the soil mapping unit is the unit at which the highest number of accurate statements and predictions can be done. The soil mapping units gives more information about the details of soils. The basis for all the interpretation is the basic mapping units. They provide the information required for the	A group of one or more individual soil mapping units having similar potentials and continuing limitations or hazards is termed as capability unit. The soils in a capability unit are sufficiently uniform to (1) produce similar kinds of cultivated crops and pasture plants with similar management practices, (2) require similar conservation treatment and management under the same kind and condition of vegetative cover, (3) have comparable potential productivity. The capability unit condenses and simplifies soils information for	are the groupings of capability units that have the same major conservation problem are called Subclasses. The problems include— 1. e >Erosion and runoff. 2. w >Excess water. 3. s >Root-zone limitations. 4. c >Climatic limitations. The information about the involved limitations and the kind of problems related to conservation are provided by capability Subclass. The information about the map user relating to the limitation	Capability classes are groups of capability subclasses or capability units that have the same relative degree of hazard or limitation. The limitation and risks of soil damage in use become more from class I to class VIII. The capability classes are useful as a means of introducing the map user to the more detailed information on the soil map. The classes show the location, amount, and general suitability of the soils for agricultural use. Only information concerning general agricultural limitations in soil use

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development of capability units, forest site groups, crop suitability groups, range site groups, engineering groups, and other interpretation groups. The most specific management ways and estimated yields relates to the individual mapping unit.	planning individual tracts of land, field by field. Capability units with the class and subclass furnish information about the degree of limitation, kind of conservation problems and the management practices needed.	degree and the kind of problems involved in broad program planning, conservation need studies, and similar purposes are provided by the class and sub class.	are obtained at the capability class level.

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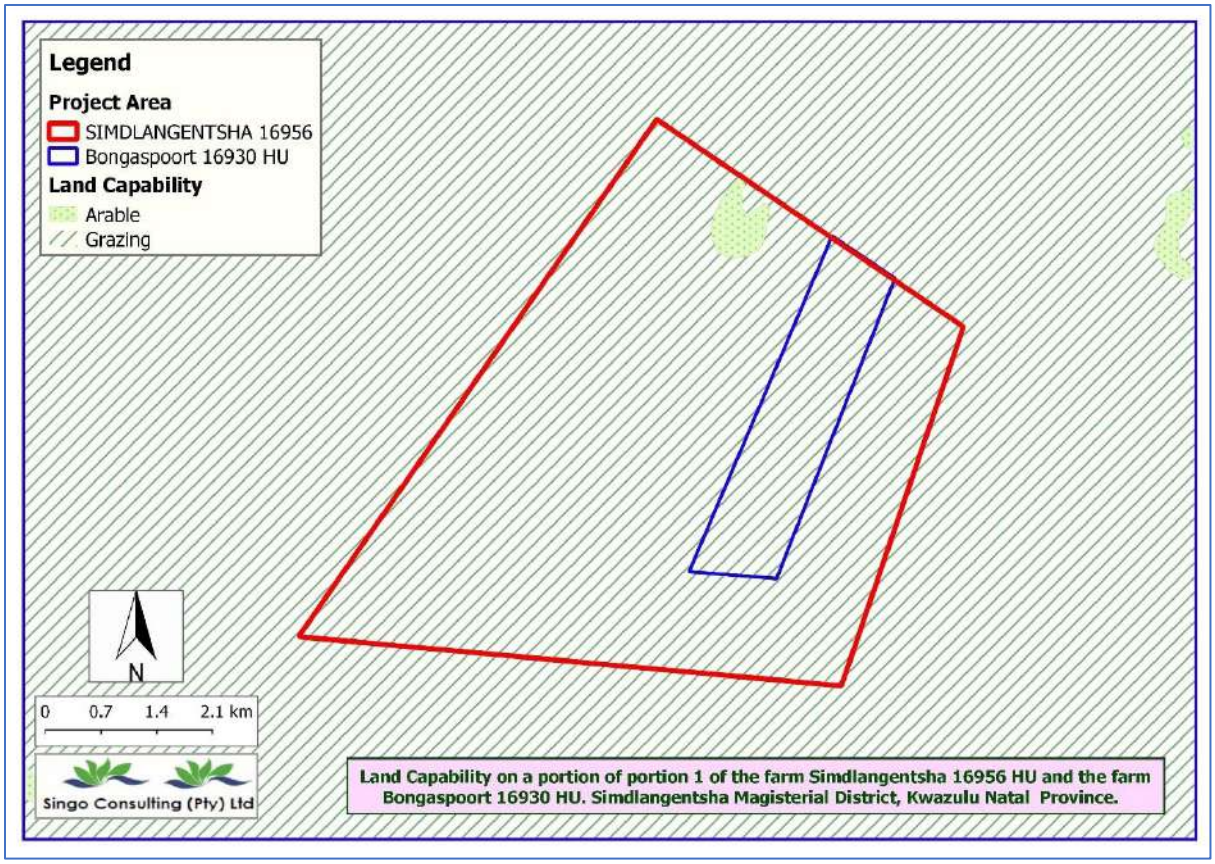

Figure 8: Land Capability map

5 SOIL IMPACT ASSESSMENT

5.1 Assessment methodology

The environmental impact assessment is designed to identify impacts related to prospecting activities and how to mitigate these impacts. It is anticipated that with the correct mitigation measures being put in place these impacts can be reduced. The rating of impacts is based on the type of activity that will be undertaken. Similar activities that will have the same impact to soil, land use and land capability have been grouped together and discussed for impacts, such as loss of topsoil as a resource.

When the impact rating is significantly different because of the activity, a separate rating has been given for those activities. The activities, such as chrome ore prospecting would potentially have a lower impact on soil, land capability and land use as these areas are less disturbed. For the purpose of this impact assessment activities that are located within relatively undisturbed areas have been rated together and all other activities falling within the prospecting area have been rated together with respect to the level of the impacts.

5.2 Impact assessment during prospecting project phase

Topsoil will not be removed as there will not be any mining related activities taking place. No foundation excavations will be needed for fuel storage depot as fuel will be transported to site daily during the drilling phase.

Table 6: Loss of topsoil as a resource, erosion, and compaction

Criteria	Details / Discussion
Description of impact	During diamond core drilling the land clearance and earthworks will have a minor impact. Even though soil will be cleared from most of the areas where infrastructure will be placed, areas that are not disturbed by the drilling will remain in their current land use. The boreholes footprint will be minimal. The pathways to be created to provide access of the drill rig can cause compaction of soil. During clearance of vegetation there is a greater risk, when compared to other areas, that topsoil would be exposed and there are potential risks for increased erosion in these areas during rainfall events, resulting in a potential loss of soil as a resource. In addition, wind erosion would be greater as these areas are exposed as a result of the removal of vegetation.
Mitigation required	• Pathways are to be stripped when the soil is dry (as far as practical possible), as to reduce compaction; and • To be stripped according to the stripping guideline and management plan, and further recommendations contained within the rehabilitation plan. • Minimize the period of exposure of soil disturbances through a planning schedule

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6. SOIL MANAGEMENT PLAN

6.1 Background

More important than chemical imbalances which can be easily restored at cost, is soil compaction and volumes of replacement during soil reclamation. Heavy drill rigs equipment to be used during prospecting may lead to areas of decreased soil and land capabilities. Such areas have limited land use options and specialized management needs. However, this impact will be minimal.

6.2 Physical mitigation

The soil to retain and supply nutrients must be assessed during prospecting operation and during borehole rehabilitation phase. Erosion and storm water runoff management measures as per EMP requirement to prevent or if prevention is impossible, limit any erosion from occurring on the drilling areas and surroundings and any storm water runoff from the activity's areas. Good quantity and quality topsoil are an essential ingredient in the process of soil reclamation.

Factors leading to decay in soil quality are:

- Contamination impacts on soil quality
- Erosion impacts on soil volume
- Undifferentiating storage impacts on soil quality and
- Undifferentiating use impacts on soil volume.

Therefore, care must be taken during the prospecting process to prevent compaction and to replace soil volumes back to a representative pre-process plant soil and land capability while emulating the pre prospecting landscape.

6.3 Soil quality indicators

Deciding on and monitoring soil quality indicators during soil impacts and reclamation can significantly improve the chances of reclaiming soil to a sustainable resource. The following actions will form part of monitoring soil quality and rehabilitation sustainability:

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- Visual soil assessment by a specialist
- Soil quality monitoring system
- Visual assessment will include specialist scoring of water ponding, plant vigour, yield, tilth, earthworms, runoff, ease of tillage, soil colour, soil aroma, soil structure and cloddiness.
- Soil quality monitoring will include bulk density, infiltration rate, water holding capacity, electrical conductivity, pH, soil nitrate and microbial activity.

To ensure sustainability from agricultural soil potential point of view, reclamation will be reclaimed back to cultivation land capacity.

Organic matter must be added back into the soil so that soil will be pre-mixed with organic material and placed back last to a depth of at least 300 mm. Continuous visual and soil quality monitoring as mentioned under the soil quality indicators above will ensure that the best possible soil reclamation procedure is followed.

Vehicle movements must be restricted to freshly dumped soil to prevent compaction as much as possible.

7 CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion and Summary

The soil classes map shows that the prospecting right area is largely covered with Association of Classes 13 and 16: Undifferentiated shallow soils, Association of Classes 1 to 4: Undifferentiated structureless soils, and land classes Red or yellow structureless soils with a plinthic horizon. The land cover of the prospecting right area is covered with wetland, plantations, natural vegetation, cultivated land, uncategorized land, and mines. The land capability of the proposed area is classified as arable and grazing land. It is anticipated that the Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial). Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, Zinc Ore resources prospecting activities will not lead to severe loss of soils and degradation of agricultural potential.

7.2 Recommendations

- Pathways will be stripped when the soil is dry (as far as practical possible), as to reduce compaction; and

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- The pathways will be stripped according to the stripping guideline and management plan, and further recommendations contained within the rehabilitation plan.
- The period of exposure of soil disturbances will be minimized through a planning schedule.
- Absorbent kits will be made available near the drill rigs during drilling activities to prevent oil spills from contaminating the surrounding soil.
- Drilling on steep slopes will be avoided, to prevent soil erosion.

8 REFERENCES

Land Type Survey Staff. 1972 – 2006. Land Types of South Africa: Digital map (1:250 000 scale) and soil inventory databases. ARC-Institute for Soil, Climate and Water, Pretoria.

Schoeman, J.L., van der Walt, M., Monnik, K.A., Thackrah, A., Malherbe, J. and le Roux, R.E., 2000. The development and application of a land capability classification system for South Africa. ARC-ISCW Report No GW/A/2000/57, ARC-Institute for Soil, Climate and Water, Pretoria Soil Classification Working Group, 1991.

Soil Classification – a taxonomic system for South Africa. ARC-Institute for Soil, Climate and Water, Pretoria.

KELLOGO, C. E., 1961. LAND-CAPABILITY CLASSIFICATION. Washington D.C: s.n.

APPENDICES

Appendix A: Specialist's qualifications

Available Upon Request

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PROSPECTING RIGHT APPLICATION

BASIC HYDROLOGICAL STUDY

Basic Hydrological Study for the proposed Prospecting Right Application for cobalt, copper ore, diamond (general), diamond (alluvial), iron ore, magnesite, manganese ore, nickel ore, rare earths, tin ore, and zinc ore on portion of portion 1 of the farm Simdlangentsha no. 16956-HU and the farm Bongasspoort no.16930-HU situated in the Magisterial District of Zululand, KwaZulu Natal Province, South Africa.

REPORT PREPARED BY:

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ULIBO RESOURCES (Pty) Ltd
Reg Nr: 2013/099506/07

DMRE REF: (KZN 30/5/1/1/2/11230 PR).

Report Credentials.

Disclaimer

The opinion expressed in this and associated reports are based on the information provided by Ulibo Resources (Pty) Ltd to Singo Consulting (Pty) Ltd ("Singo Consulting") and is specific to the scope of work agreed with Ulibo Resources (Pty) Ltd. Singo Consulting acts as an advisor to the Ulibo Resources (Pty) Ltd and exercises all reasonable skill and care in the provision of its professional services in a manner consistent with the level of care and expertise exercised by members of the environmental profession. Except where expressly stated, Singo Consulting has not verified the validity, accuracy or comprehensiveness of any information supplied for its reports. Singo Consulting shall not be held liable for any errors or omissions in the information given or any consequential loss resulting from commercial decisions or acts arising from them. Where site inspections, testing or fieldwork have taken place, the report is based on the information made available by Ulibo Resources (Pty) Ltd or their nominees during the visit, visual observations and any subsequent discussions with regulatory authorities. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Singo Consulting is both complete and accurate. It is further assumed that normal activities were being undertaken at the site on the day of the site visit(s), unless explicitly stated otherwise. These views do not generally refer to circumstances and features that may occur after the date of this study, which were not previously known to Singo Consulting (Pty) Ltd or had the opportunity to assess.

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Project details

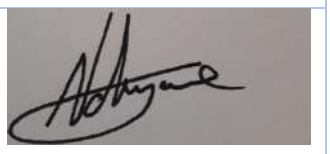
Report type	**Basic Hydrological Study for a Prospecting Right Application**	
Mineral (s)	Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial), Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, and Zinc Ore	
Client	Ulibo Resources (Pty) Ltd	
Site location	Portion of portion 1 of the farm Simdlangentsha No. 16956-HU and the farm Bongasspoort No. 16930-HU situated in the Magisterial District of Zululand	
Version	1	
Date	5 July 2022	
		Electronic signatures
		Compiled by
Compiled by	Fhatuwani Ndonyane (Hydrogeologist intern) Singo Consulting (Pty) Ltd	
Reviewed by	Mutshidzi Munyai (Hydrogeologist) Singo Consulting (Pty) Ltd (Water Resources Science (Candidate Natural Scientist), Environment Science (Candidate Natural Scientist) (SACNASP Registration Number 122464)	
Final review and approval	Dr. Kenneth Singo (Principal Consultant of Singo Consulting (Pty) Ltd)	

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Table 1: Critical Report Information

Critical Information incorporated within the Hydrological Study:	Relevant section in report
Details of the specialist who prepared the report	Project Details, P: 3
The expertise of that person to compile a specialist report including a curriculum vitae	Appendix A, P: 42
Project Background Information, including the proposed activities description	Introduction, P: 9
An indication of the scope of, and the purpose for which, the report was prepared	Scope of work, P: 10
An indication of the quality and age of base data used for the specialist report	Project Details, P: 3
A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Surface water impact assessment, P: 34
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Project Details, P: 3
A description of the methodology implemented in preparing the report or carrying out the specialised process comprehensive of equipment and modelling used;	Methodology, P: 34
Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternative;	N/A
An identification of any areas to be avoided, including buffers	Buffer zone P: 26
A map overlaying the proposed activity including the associated infrastructures on the environmental sensitivities of the site including containing buffer zones	Buffer zone, P: 26
A description of the findings and potential implications of such findings on the impact of the proposed activity or activities	Impact assessment ratings and mitigation measures, P: 36
Any mitigation and conditions measures for inclusion in the EMPr	Stormwater management plan, P: 39
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Monitoring plan, P: 39
An analytic opinion as to whether the proposed activity or portions thereof should be Authorised-i.e. specific recommendations	Recommendations, P: 42
Regarding the acceptability of the proposed activity or activities; and	Refer to the Bar
If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Stormwater management plan, P: 39
A description of any consultation process that was undertaken during carrying out the study	Refer to the Bar
Any triggered Water Uses according to section 21 of the National Water Act 36, 1998.	Relevant Legislation and Standards, P: 12
Any other information requested by the competent authority.	N/A

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1 INTRODUCTION

According to the recent World Health Organization (WHO) report, the countries which still have limited access to water for drinking purposes are mainly those in the Sub-Saharan region (Verlicchi and Grillini, 2020). It is with this knowledge that the protection of surface water sources is ensured. According to WHO (2004), Surface water is any body of water that is above ground which includes but not limited to streams, lakes, dams, and wetlands.

1.1 Project Background Information

Singo Consulting (Pty) Ltd was appointed by Ulibo Resources (Pty) Ltd as an independent consulting company, to conduct a basic hydrological study. The basic hydrological study is being conducted in support to a prospecting right application for cobalt, copper ore, diamond (general), diamond (alluvial), iron ore, magnesite, manganese ore, nickel ore, rare earths, and tin ore, situated within portion of portion 1 of the farm Simdlangentsha No. 16956-HU and the farm Bongasspoort No. 16930-HU situated in the Magisterial District of Zululand. KwaZulu Natal Province, South Africa.

Chapter 3 of the National Water Act (Act 36 of 1998) requires that a person who owns, control, occupies, uses the land is responsible for preventing pollution of water resources and is also responsible to remedy (correct) the effects of the pollution. It is with this Act that the basic hydrological report was deemed necessary for the site to gather all relevant information related to surface water and its related potential impacts.

The goal of this study:

- To assess the quality condition of surface water within and around the prospecting area, and to draft a water monitoring programme for the project site and provide recommendations.
- Prediction of the environmental impact of the proposed prospecting activity on the hydrological regime of the area.
- Forecasting the effects of the activity on the receiving environment.

1.2 Proposed Activities

Prospecting right activities which have the potential to impact the surface water and groundwater in the area includes:

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- **Diamond drilling**- Core drilling (NQ size) will be conducted to delineate the strike length and thicknesses of the mineralized layers
- **Geophysical survey work to be undertaken**- Ground magnetic and probably electro-magnetic surveys will be undertaken to define the contacts of the layers with the host rocks. A consideration to conduct air-borne geophysical surveys will be made once preliminary investigations have been completed.
- **Geohydrological survey work to be undertaken**- Diamond drilling (open hole) boreholes may be drilled to gather geohydrological information with specific reference to aquifer yield testing and gathering of water samples for analytical purposes.

Prospecting activities will be undertaken over a period of five (5) years and are designed in phases, each phase is conditional on the success of the previous phase. Both invasive and non-invasive methods will be implemented. Invasive are those activities which have footprint or cause harm (if not mitigated or managed properly) or those that have a physical impact on the environment, while non-invasive do not cause any harm or effects on the environment.

Non-invasive: Desktop study of the area has commenced, and this incorporates desktop geographical and geological mapping. This will be followed by detailed geochemical and geotechnical surveys. In turn, this is followed by detailed geophysical studies.

Invasive: A detailed drilling, sampling, assaying and mineralogical study will be carried out. Diamond method will be utilised to prospect cobalt, copper ore, diamond (general), diamond (alluvial), iron ore, magnesite, manganese ore, nickel ore, rare earths, tin ore, and zinc ore deposits. To ensure or minimise impacts on the receiving environment, All the activities will be guided by the project's BAR & EMPr.

1.3 Scope of Work

- Baseline study

  - A desktop study was conducted to evaluate current and previous land uses to assess the implications for hydrology contaminations.
  - Site visit to correlate the information that was collected during the desk study.
  - Maps from the hydrology study will be used to indicate the catchment areas and any strategic points.

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- The Mean Annual Runoff (MAR), peak flow rates and volumes will be estimated for these catchments using WR2012 data.

- Impacts assessment

  - All surface water impacts will be described, and mitigation measures will then be proposed as normally required for the Environmental Impact Assessment/Environmental Management Plan (EIA/EMP), for the construction, operation, decommissioning, and post closure phases.

1.4 Project Location

The locality map created by the QGIS illustrates the location of the proposed area is located on portion of portion 1 of the farm Simdlangentsha no. 16956-HU and the farm Bongasspoort no. 16930-HU situated in the Magisterial District of Zululand, KwaZulu Natal Province, South Africa.

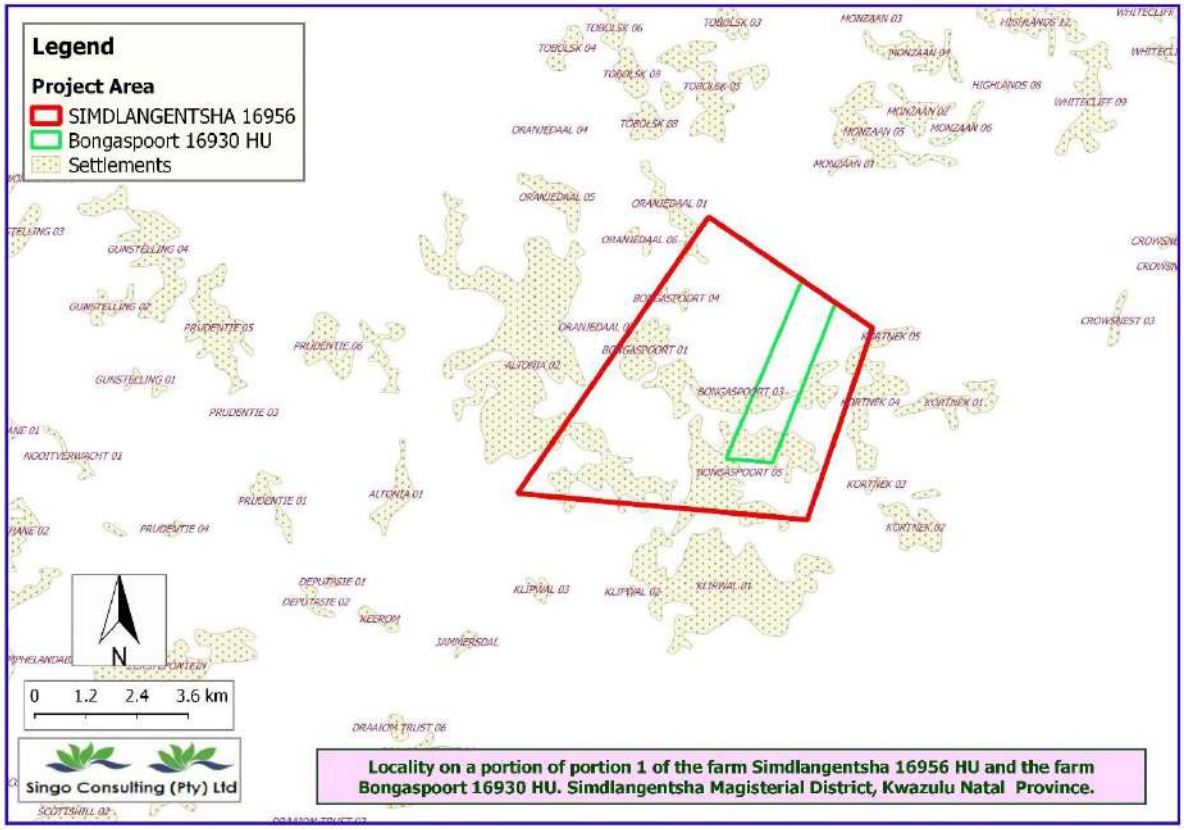

Figure 1: Locality map of the project area.

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2 RELEVANT LEGISLATION AND STANDARDS

Government Notice 704 (Government Gazette 20118 of June 1999) (hereafter referred to as GN 704), was established to provide regulations on the use of water for mining and related activities aimed at the protection of water resources.

- **Condition 5** - which indicates that no residue or substance which causes or is likely to cause pollution of a water resource may be used in the construction of any prospecting work.
- **Condition 7** - which describes the measures which must be taken to protect water resources. All dirty water or substances which may cause pollution should be prevented from entering a water resource (by spillage, seepage, erosion etc) and ensure that water used in any process is recycled as far as practicable.

2.1 Legal Framework

DWA's vision for water quality management in South Africa is to:

- Ensure the continuous improvement of Water Quality Management
- Become a recognized world leader in Water Quality Management
- Be proactive, dynamic, efficient, and effective in its delivery of services to the public
- Provide the necessary policies and systems to ensure integrated sustainable management of water quality
- Promote cooperative governance across all spheres of management and
- Ensure a fully capacitated, loyal workforce to support its functions.

2.2 National Legislation

National legislation applicable to surface water management includes:

- Constitution of the Republic of South Africa, 1996 (No. 108 of 1996) – The Bill of Rights states that everyone has the right to an environment that is not harmful to their health or well-being.
- National Water Act, 1998 (Act 36 of 1998) – Provides for the protection of the quality of water and water resources in South Africa and provides for the establishment of Water Management.

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2.3 National Policy/Guidelines

National policy and guidelines applicable to surface water management includes:

- South African Water Quality Guidelines, First Edition, 1996 – These guidelines set out the minimum water quality requirements for a range of water quality parameters for each water user.
- Development of a Waste Discharge Charge System: Framework Document. Second Edition, 2000 – Provides a framework for the implementation of a system to charge for water use such as the discharge of waste that impacts on water resources.
- Best Practice Guidelines for the mining sector, DWAF 2006, 2008 dealing with aspects of DWA's water management hierarchy and deals with integrated mine water management, pollution prevention and minimisation of impacts, water reuse and reclamation and water treatment.
- Best Practice Guidelines for the mining sector, DWAF 2006, 2008 dealing with general water management strategies, techniques and tools which could be applied cross – sectorial and deals with storm water management, water and salt balances, water monitoring systems, impact prediction.
- Best Practice Guidelines for the mining sector, DWAF 2006-2008 dealing with specific mining activities and addresses the prevention and management of impacts from small scale mining, water management for Mine Residue Deposits, pollution control dams, water management for surface mines, and water management for underground mines.

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3 HYDROLOGICAL SETTING

3.1 Climate

From the month of May to the month of October, the prospecting right area has a pleasant average temperature that fall between 20°C and 25°C. The warmest months are January and February with an average high temperature of 30°C and a low of 17°C. The coldest month is July with an average maximum temperature of 24°C and an average low of 7°C.

The average mean annual rainfall of the study area is between 801 and 1000 mm, with January been the month that experiences high rate of rainfall per year compared to the other months. June and July have the least amount of rainfall.

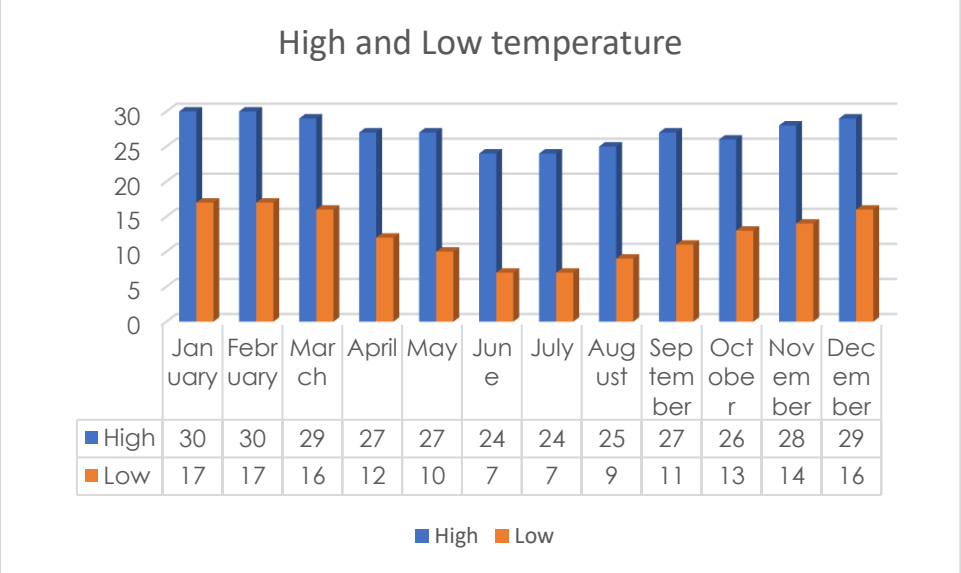

Figure 2: High and Low temperature

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Figure 3: Mean annual rainfall map

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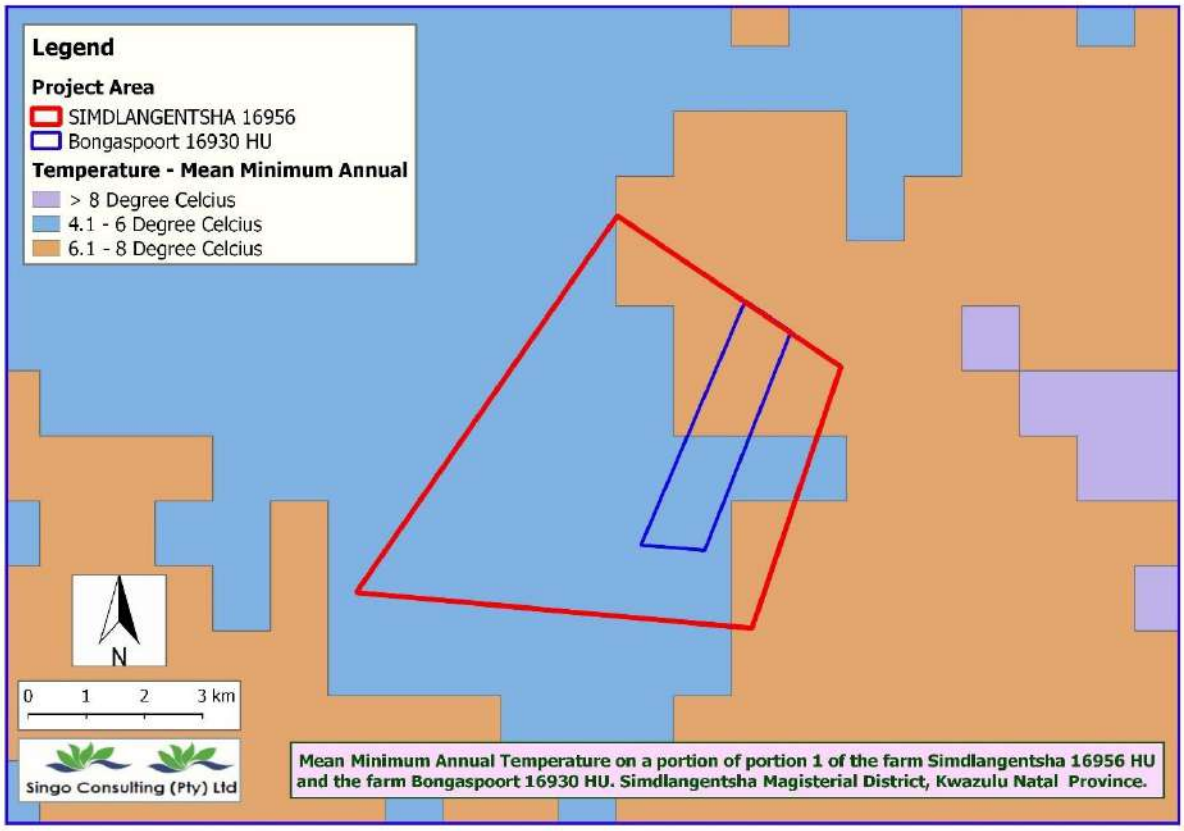

Figure 4: Mean minimum annual temperature map

3.2 Drainage and Topography

3.2.1 Topography

Topography is the study of the shape and features of land surfaces. A Topographic map is a map which indicates, to scale, the natural features of the Earth's surface, as well as human features, with features at the correct relationship to each other (Oxford Dictionary; 2020). The topography of an area could refer to the surface shapes and features themselves, or a description (especially their depiction in maps). Topography is a field of geoscience and planetary science and is concerned with local detail in general, including not only relief but also natural and artificial features, and even local history and culture.

The topography map other than showing landform features, rivers, and associated water resources, it also shows the height above sea level with the use of contour lines. Contour lines are an Imaginary line on the ground surface joining the points of equal elevation. The study area consists of 20m contour interval as seen on Figure 7 below, with convex and concave slopes. The topography map also depicts a plateau, Messa and butte landforms.

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- **Plateau:** A relatively level, large expanse of land that rises some 457 meters or more above its surroundings and has at least one steep side (source: **Mesa and Butte - The shape of the land, Forces and changes, Spotlight on famous forms, For More Information (scienceclarified.com)**.
- The prospecting right area is a mountainous area, with hills on the Northern side of the study area. The site has valleys that formed a dendritic pattern, and channels water towards the perennial river.
- **Dendritic Pattern:** they develop when the river channel follows the slope of the terrain often found in mountainous areas.
- **Valley**: this is an elongate depression of the earth's surface usually between ranges of hills or mountains or an area drained by a river and its tributaries.

Types of slopes found in the study area.

- **Concave Slope**: The slope is very gentle at the foot, and it goes on getting steeper and steeper towards the top. The concave slope is found in the southwest direction from the center of the study area. The elevation ranges between 800 – 920 mamsl.
- **Convex Slope:** The slope is very steep at the foot, and it goes on becoming gentle towards the top. In the study area, the slope is in the north-western direction from the center of the study area ranging from 660 – 860 mamsl in elevation. Upon analysis of the topography of the study area, the study area is mostly characterized by steep slopes in the northern direction, with minor gentle slopes towards the southern direction of the study area.

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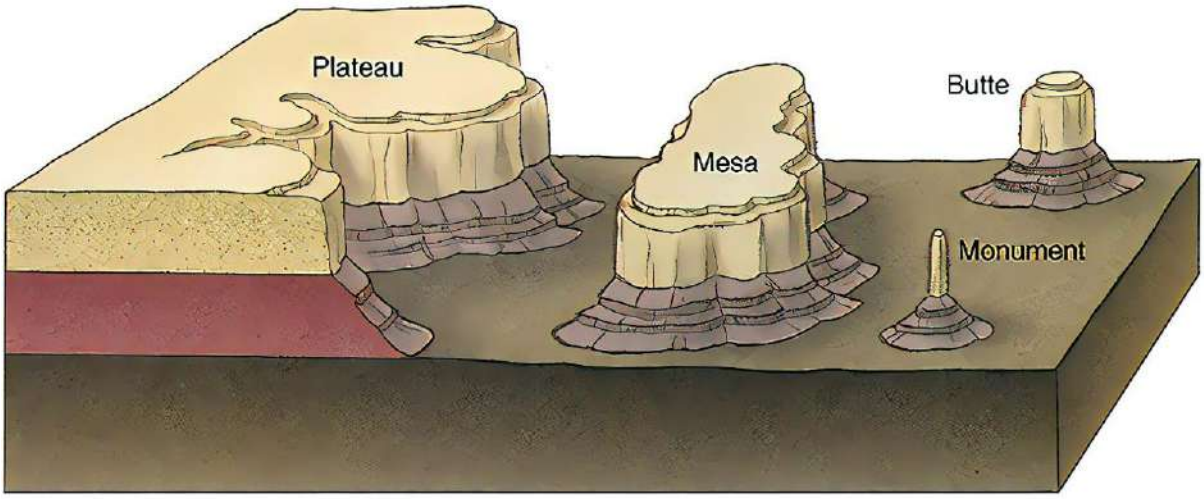

Figure 5: difference in sizes between Plateau, Messa and Butte(Source: Messa and butte - Bing images)

3.2.2 Drainage

The hydrology surrounding the proposed area is of vital importance as well. In this context hydrology is all the surface waters appearing within and nearby the proposed project area, where a potential to be impacted upon by the project exist. The hydrology map, illustrates that the following water bodies exists within and nearby the project area:

- Non-perennial rivers.
- Perennial.

These are important natural water resources that should not be disturbed by anthropogenic activities. For this project where prospecting right poses a risk on them, there will be measures and guidelines put in place that will protect the water resources in this area to ensure optimal conservation of water.

Oxbow lake formation: Oxbow lakes are curved U-shaped lakes that exist and are created by the meandering action of a river. The Oxbow lakes are created through erosion and deposition processes that occur in rivers that run through soft landscapes. When sediments are carried away erosion occurs, and when sediments are left behind deposition occurs. Deposition occurs along the inside bank of a river's meander, where the slower moving waters leave behind sediments and rock. Erosion occurs along the outside bank of a meander where fast moving waters break up and carry away sediments. These two actions of eroding and

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depositing sediments along banks cause rivers to meander, and eventually create oxbow lakes through a series of steps that occur at the neck of a meander.

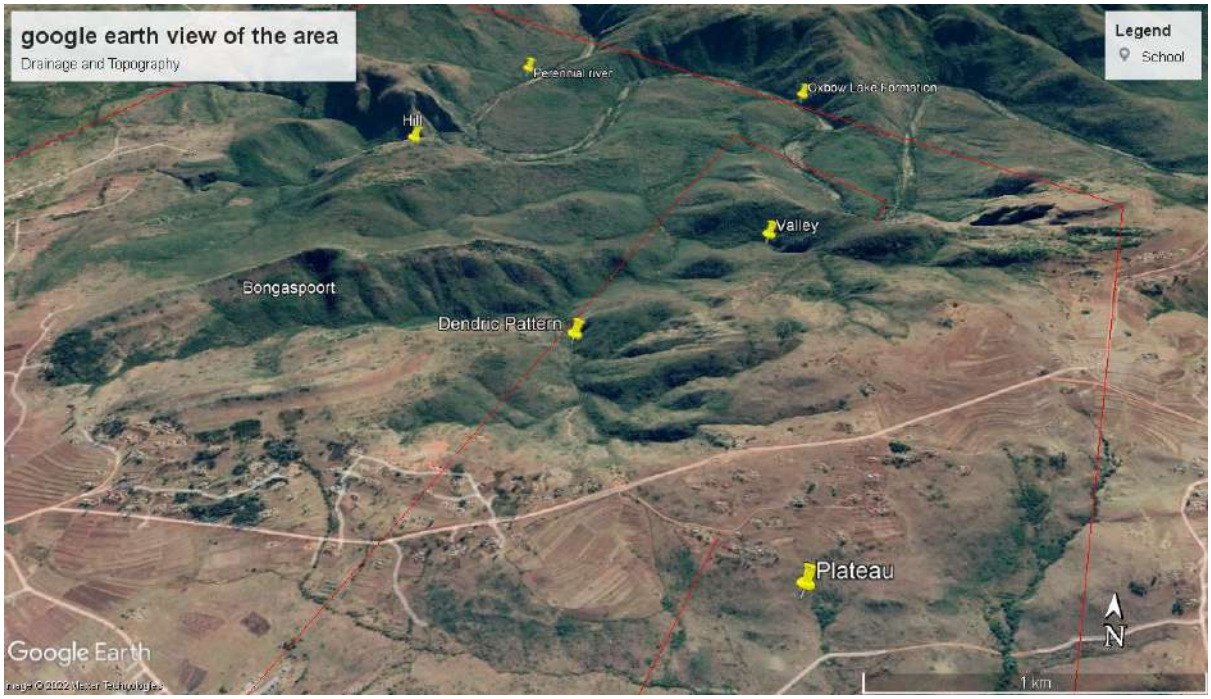

Figure 6: Google earth view of the study area

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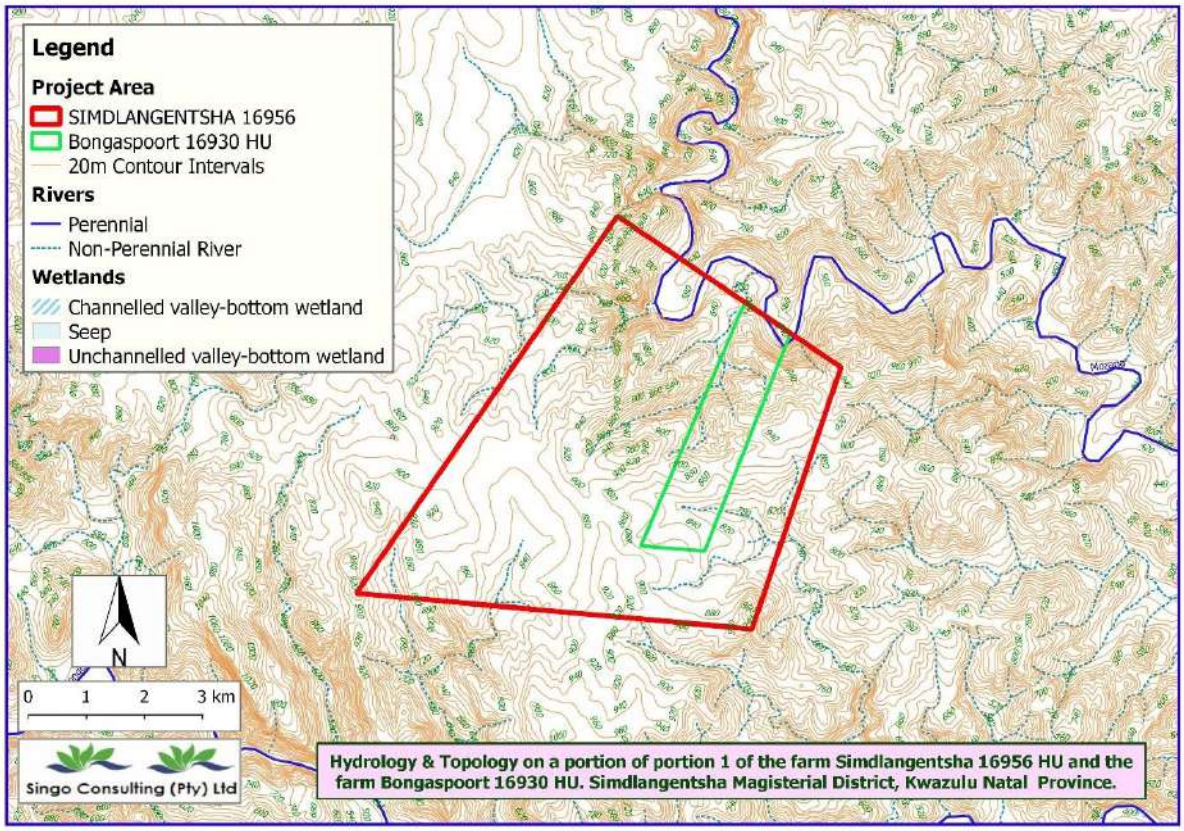

Figure 7: Hydrology and Topology of the study area

3.3 Catchment Description

South Africa's water resources are divided into quaternary catchments, which are the country's primary water management units (DWAF 2011). In a hierarchical classification system, a quaternary catchment is a fourth order catchment below the primary catchments. The primary drainages are further classified as Water Management Areas (WMA) and Catchment Management Agencies (CMA). In accordance with Section 5 subsection 5(1) of the National Water Act, 1998, the Department of Water and Sanitation (DWS) has established nine WMAs and nine CMAs as outlined in the National Water Resource Strategy 2 (2013). (Act No. 36 of 1998). The purpose of establishing these WMAs and CMAs is to improve water governance in various regions of the country, ensuring a fair and equal distribution of the Nation's water resources while ensuring resource quality is maintained.

The prospecting area falls within the Usutu to Mhlathuze Water Management Area (WMA). The quaternary catchment is W42L and W42J. The WRC 2012 study, presents hydrological parameters for each quaternary catchment including area, mean annual precipitation (MAP) and mean annual runoff (MAR).

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Table 2: Quaternary Information data

Quaternary Catchment	Water Management area	S-Pan Evaporation		Rainfall		
		Evaporation Zone	MAE (mm)	Rainfall Zone	MAP (mm)	Catchment Area
W42J	Usutu To Mhlathuze	13A	1500	W4C	756	290
W42L	Usutu To Mhlathuze	13A	1450	W4C	764	251

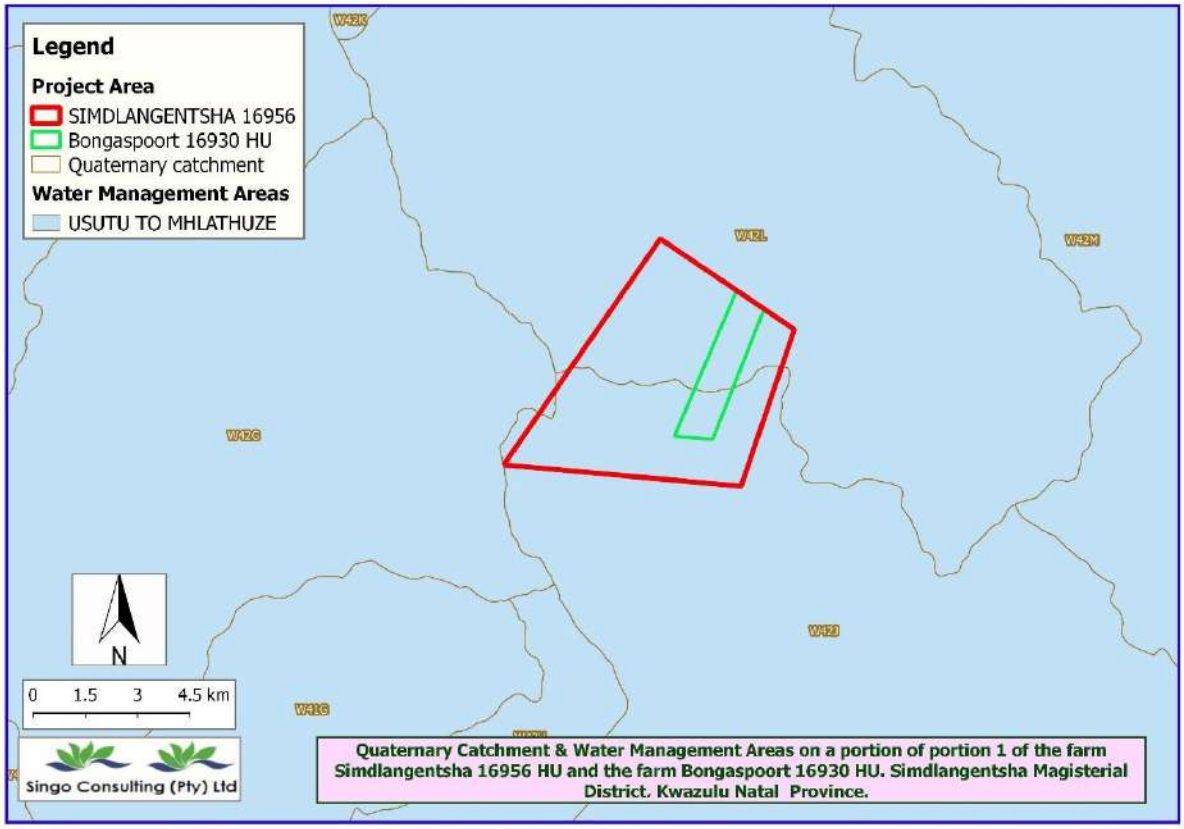

Figure 8: Quaternary Catchment map

3.4 Wetlands Delineation

According to National water Act 36 of 1998, a wetland is defined as Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances

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supports or would support vegetation typically adapted to life in saturated soil. Wetland delineation is the process of identifying outer edge of the temporary zone of the wetland.

Whilst the identification of a wetland is useful, normally the requirement (specifically for EIA and WULA applications) is for the wetland to be delineated – for its boundaries to be precisely determined so that it can be mapped out and indicated as a sensitive area. This edge marks the boundary between the wetland (water resource) and the adjacent terrestrial areas. This process is aided by using the various indicators which are used to identify a wetland, the indicators are as follows:

- The **position in the landscape**, which will help identify those parts of the landscape where wetlands are more likely to occur.
- The **type of soil form** (i.e., the type of soil according to a standard soil classification system), since wetlands are associated with certain soil types.
- The presence of wetland **vegetation species**.
- The presence of **redoxymorphic soil features**, which are morphological signatures that appear in soils with prolonged periods of saturation (due to the anaerobic conditions which result).

To this study, redoxymorphic indicator will be used to delineate a wetland, this is because it is the most reliable, diagnostic indicator of wetland. These features develop due to prolonged saturation (and associated anaerobic conditions) and can be used to indicate zones of a permanently, seasonally, or temporarily high-water table, as described in the characteristics of the permanent, seasonal, and temporary wetland zones in the national water Act 36 of 1998.

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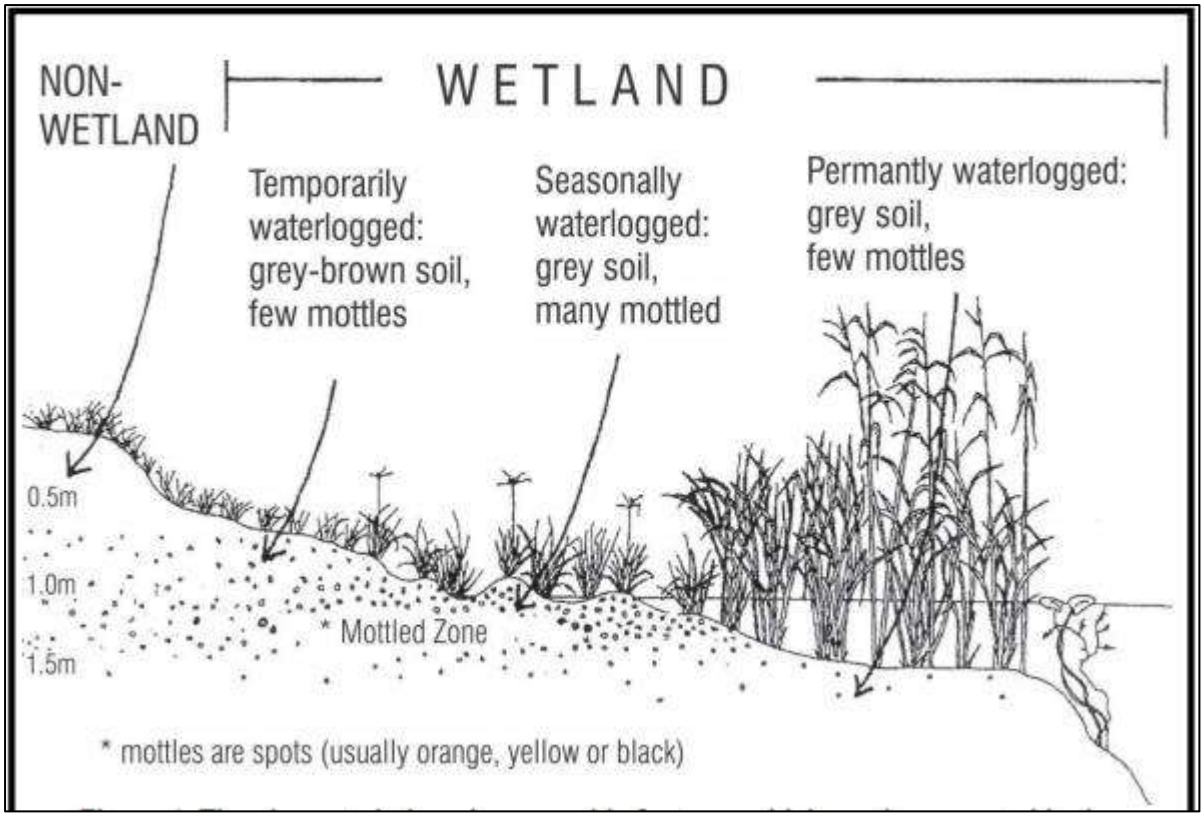

Figure 9: The characteristics of redoxymorphic indicator (DWAF, 2008)

Redoxymorphic features as an indicator of a wetland presence.

Water is the most important criterion for defining land as a wetland, with "the water table at or near the surface, or the ground is occasionally covered with shallow water" being the most important. Unfortunately, due to southern Africa's very fluctuating climate, the water table may not always remain at or near the surface in a consistent, predictable manner year after year, or even seasonally predictable. The existence of the water table (or the extent of flooding) will not always be a highly useful criteria for detecting wetlands due to intra- and inter-annual fluctuations in the extent of saturation/inundation of wetlands. As a result, the fundamental wetlands classification criterion – a high water table and/or frequent flooding – cannot be accurately measured.

Roots and microorganisms eventually deplete the oxygen contained in pore spaces in soil that has been saturated for an extended period. The oxygen consumed in this fashion would be replaced by diffusion from the air at the soil surface in an unsaturated soil. However, because oxygen diffuses 10 000 times slower via water than it does through air, restoring depleted soil oxygen in a saturated soil takes much longer. As a result, once the oxygen in a saturated soil

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is gone, the soil becomes practically anaerobic. Long-term anaerobic soil conditions cause changes in the chemical properties of the soil's mineral constituents, which are visible as colour changes in the soil. As a result, even a high-water table. Although the frequency of flooding cannot be directly assessed, it is possible to analyse soil parameters for signs of saturation by looking for redoxymorphic traits that come from prolonged anaerobic conditions. The two important redoxymorphic features are mottling and gleying in Figure 10 and Figure 11; both features caused by prolonged saturated conditions in the soil and the subsequent development of anaerobic conditions.

Gleying is characterised by the development of grey or blueish-grey colours in the mineral soil component. Certain soil components, such as iron and manganese, are insoluble under aerobic conditions. Iron is one of the most abundant elements in soils, and the iron oxide (rust) coatings over soil particles is responsible for the red and brown colours of many soils. However, under prolonged anaerobic conditions iron becomes soluble and can thus be dissolved out of the soil profile. Once most of the iron has been dissolved out of a soil, the soil matrix is left a greyish, greenish, or bluish colour, and is said to be Gleyed.

Mottling follows the same initial process as gleying, in that the iron becomes soluble and dissolved under anaerobic conditions. A fluctuating water table, common in wetlands that are seasonally or temporarily saturated, results in alternation between aerobic and anaerobic conditions in the soil. Lowering of the water table results in a switch from anaerobic to aerobic soil conditions, causing dissolved iron to return to an insoluble state and be deposited in the form of patches, or mottles, in the soil. Recurrence of this cycle of wetting and drying over many decades concentrates these bright (orange or red) insoluble iron compounds. Thus, soil that is Gleyed but has many mottles may be interpreted as indicating a zone that is seasonally or temporarily saturated.

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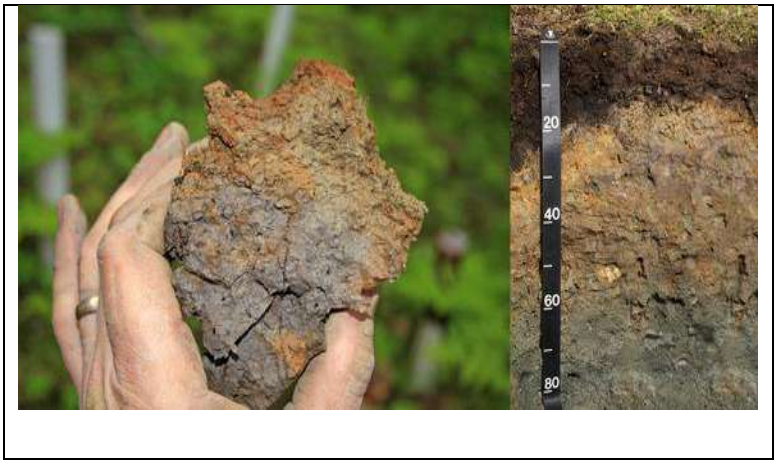

Figure 10: Identification of Mottles (Source: redoxymorphic feature mottling-Bing images))

Figure 11: Identification of Greying (Source: redoxymorphic feature Mottling- Bing images))

Using redoxymorphic features to identify a wetland.

The outer edge of the temporary zone of the wetland should be determined. This will be done using a transect-based approach in the field. Starting from the wettest (central or lowest lying) part of the wetland, move perpendicularly upslope towards the surrounding terrestrial areas, sampling (with the aid of an auger or through other excavation means) the soil to a depth of at least 50cm. Note the presence of any gleying or mottling (Rountree et al., 2008). Ensure that the indicators observed meet the requirements prescribed for the redoxymorphic indicators of wetland soils. Continue moving outwards from the wetland until the redoxymorphic indicators of wetland soils can no longer be found within the top 50cm of the soil. This will be the outer

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edge of the temporary wetland zone. At this stage the boundary indicated by redoxymorphic features should be verified using the vegetation indicators.

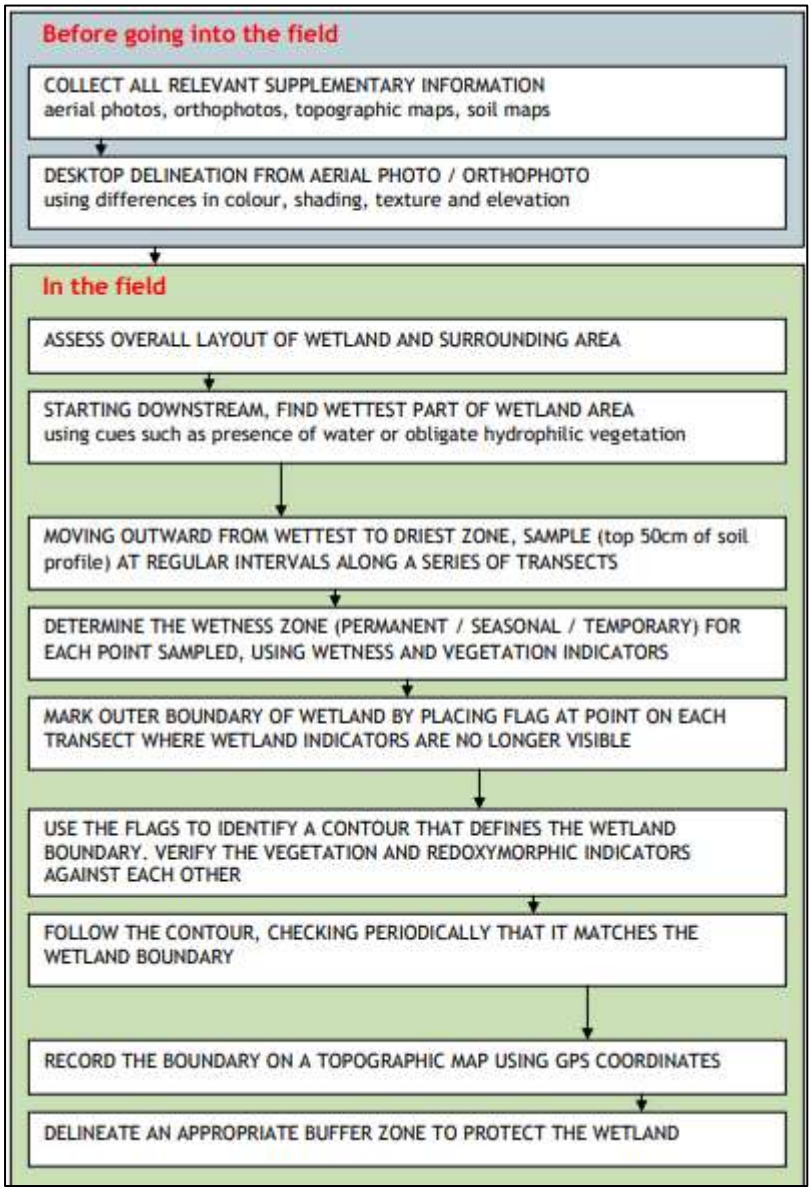

Figure 12: Wetland delineation process (DWAF, 2008)

3.5 Buffer Zones

During the prospecting right activities which will include, Diamond drilling, Geophysical survey and Geohydrological survey. Caution must be taken with regards to the water bodies existing within the proposed project area. This includes the implementation of buffer zones. Buffer zones

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as depicted by the map will be the areas where the prospecting team will be notified not to conduct any activities within the depicted 100m radius from the water bodies.

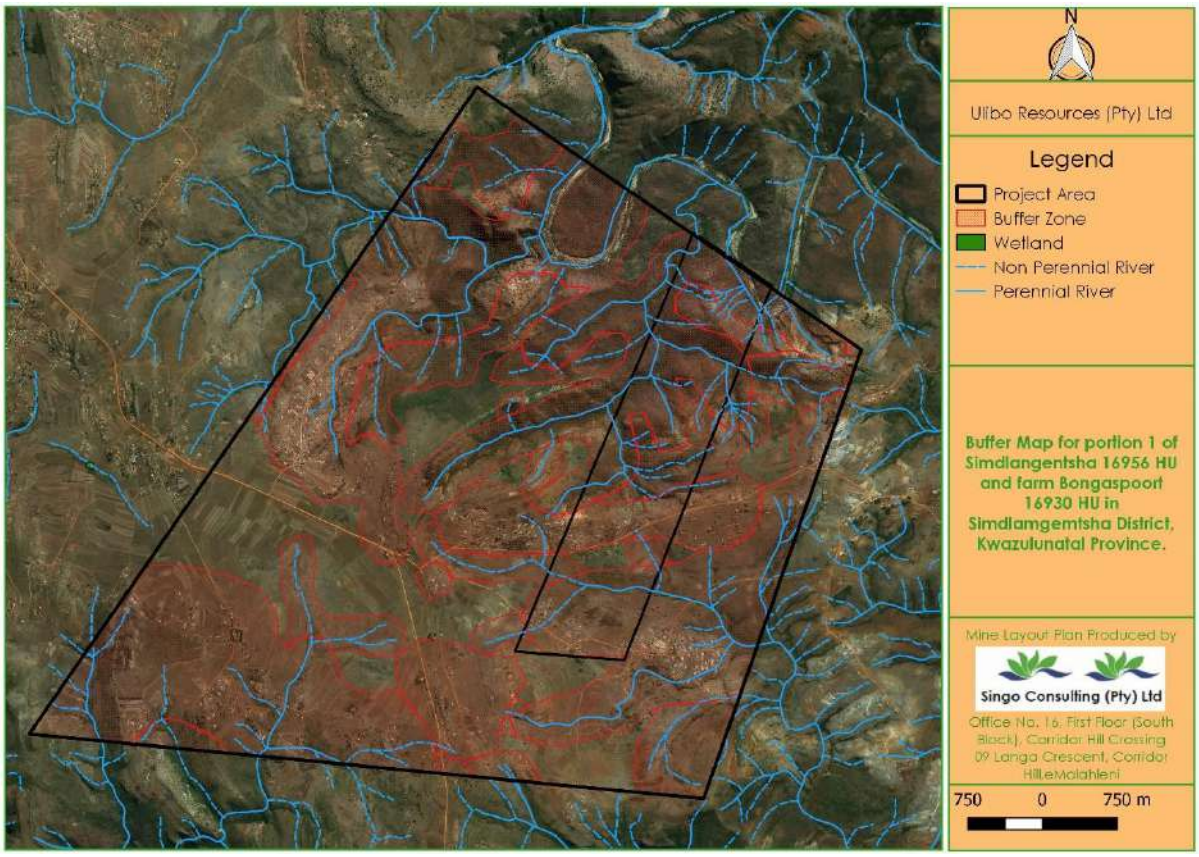

Figure 13: Buffer Zone Map

3.5 Geological setting

Dwyka Group

The Dwyka Group is composed of sediments derived from glacial activity on Gondwana 270Ma ago (evidence provided by numerous glacial pavements in the Northern and Central Regions). The Dwyka Group forms the lowermost and oldest deposit in the Karoo Supergroup basin. The Karoo Basin extended across much of southern Gondwana and records 120 million years of geological history. The tillite in KZN often weathers to a characteristic yellowish colour. The formation is found covering the Pongola Supergroup throughout the Northern, Central and Southern Regions. The Dwyka sediments were deposited on a rugged palaeotopography scoured out by moving glaciers. The formation consists predominantly of characteristic tillite,

as well as diamictite (of undetermined origin), siltstones and sandstones (Armstrong, 1980; Groenewald, 1984).

The distinctive character of the Dwyka Group in northern KwaZulu/Natal is partly attributable to the complex tectonic setting in which it occurs and reflects an interplay of various factors that controlled the styles of sedimentation during deglaciation. Rapid dissipation of the ice in the closing stages of deglaciation was followed by accumulation of postglacial muds which mantled the glaciogenic sediments. In the northernmost part of the study area proximal products of deglaciation, represented by conglomeratic deposits and associated sandstones, are preserved in deep partly exhumed glaciated valleys and depressions along the southern periphery of the Archaean upland. The distinctive character of the Dwyka Group in northern KwaZulu/Natal is partly attributable to the complex tectonic setting in which it occurs and reflects an interplay of various factors that controlled the styles of sedimentation during deglaciation.

The lower mudstone unit is overlain by 3 m of well banded, Superior-type banded iron formation. Macrobands of iron oxides are interlayered with bands of jaspilite, the former being predominantly magnetite. Macrobands are separated by sharp contacts, with bands ranging in thickness from 1 to 5 cm in thickness. Microbands 1 to 3 mm thick are often present within jaspilitic macrobands. The banded iron formation is overlain with a gradational contact by ~3 m of foliated green shale. The Karoo Dolerites associated with the Drakensberg Group lavas, are found throughout the Northern, Central and Southern Regions of Pongola Supergroup.

Pongola Supergroup

The Pongola Supergroup is a meso-Archaean volcano-sedimentary succession that outcrops in southeastern Mpumalanga, northern KwaZulu Natal and Swaziland It is divided into two distinct sequences - the lower Nsuze Group and the upper Mozaan Group. The Nsuze Group is mainly composed of volcanic rocks while sedimentary rocks dominate the Mozaan Group. The Pongola Supergroup has been regionally metamorphosed to lower greenschist facies, although amphibolite facies is observed in some exposures in southeastern Swaziland (SACS, 1980).

The Northern Region comprises of the Pongola Supergroup and extends approximately 125km in a north-south orientation, from east of Piet Retief to south of the Bivane River, covering an area of 1100km2 (Armstrong, 1980; Hatfield, 1990). In this area the Pongola Supergroup is at its

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stratigraphic thickest. A small-elongated inlier (-200km2) also exists around the town of Amsterdam in eastern Mpumalanga and outcrops are found throughout southern Swaziland. The western margin of the Northern Region is relatively undisturbed, preserving the basal contact of the Pongola Supergroup on older granitoid basement, while the eastern and northeastern margins have been extensively deformed by the intrusion of post-Pongola granitoid plutons. Both the Nsuze Group and Mozaan Group are present in the Northern Region (Matthews, 1990).

Klipwal Member diamictite

The Klipwal formation is of the Mozaan Group in the Pongola Supergroup. The Mozaan group together with the correlative Witwatersrand Supergroup host the oldest, best-preserved cover successions deposited on a stable craton between 2.96 – 2.84 Ga ago, it is associated with post-Pongola granites which intruded the Pongola Supergroup during this interval. Little is known about the tectonic processes which operated on the young Earth in the Archean. Palaeomagnetism remains the most robust method with which early cratonic movements can be constrained. There is a poor paleomagnetic record for the Kaapvaal Craton during the Archean. The geochemical data suggests a strong mafic to ultramafic source with minor felsic input. The CIA is consistent with moderate weathering which probably took place at the source. The elevated levels of iron are attributed to the precipitation of ferric-oxyhydroxides from the anoxic seawater with a high concentration of dissolved iron. Petrographic and field studies suggest that sediments were sourced from an off-craton greenstone terrane adjacent to the Witwatersrand – Mozaan basin indicating that the extent of glaciation was more extensive than previously thought.

The Klipkloof quartz arenite is overlain with a sharp and locally sheared contact by shales and siltstones of the Vlakhoek Member. This sharp contact is identified within the White Umfolozi, Denny Dalton and Goje sectors. In the Nobamba sector however, alternating beds of shale and coarse siltstone form a fining-up sequence from the underlying gritty quartz arenites. The lowermost 5 m of the member comprises dark grey to black laminated mudrock with interlayered fine siltstone at its base. The siltstone interlayers attain a maximum thickness of 5 cm with a mean of 2 cm and are only present within the lower 2 m of the unit. Ferruginous mudstone interlayers are evident in the upper 2 m of the unit and exhibit a characteristic faint red colouration. Pyrite is the most abundant ore mineral in all the sections and commonly makes up 70 to 80% of the ore minerals present in the conglomerates. Pyrite occurs as sand to

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pebble-sized grains, as well as anhedral to euhedral crystals within the matrix. Three generations of pyrite can be identified.

Nkoneni Subgroup

The top of the Moozan group consists of three that constitute the 600m Nkoneni subgroup, its lowermost formation is the Bongaspport formation which is 250m thick it is composed of coarsening-upwards metasandstone and quartzwackes deposited on a sandy fluvial braid plain (Beukes & Cairncross 1991) the central 100 to 800m thick and predominantly the volcanic Gabela formation is characterized by pyroclastic rock including andesitic and dacitic tuff as well a fragmented komatiite interbedded among sandstone and shale (Wilson & Zech, 2018).the uppermost 150m thick Ntanyana formation is composed of both coarse grained sandstone and magnetic shale of fluvial and marine origin (Gold 2006).

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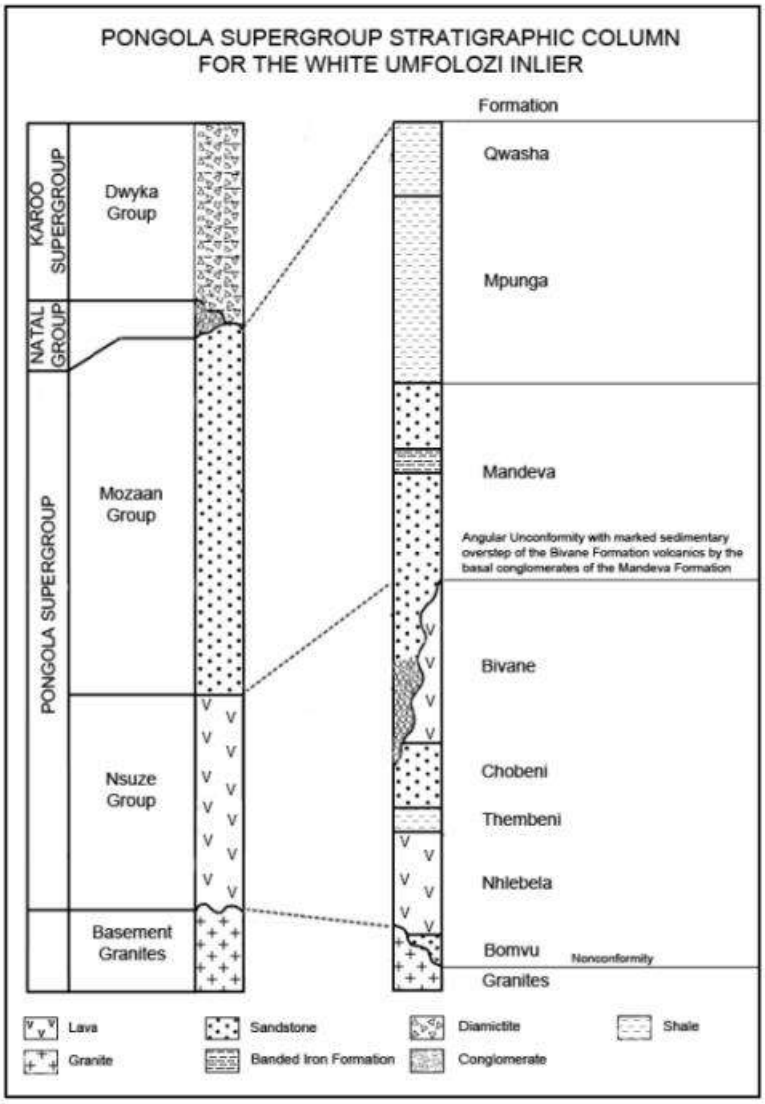

Figure 14: Stratigraphic column for the White Umfolozi Inlier compiled by the author, showing the Groups and Formations

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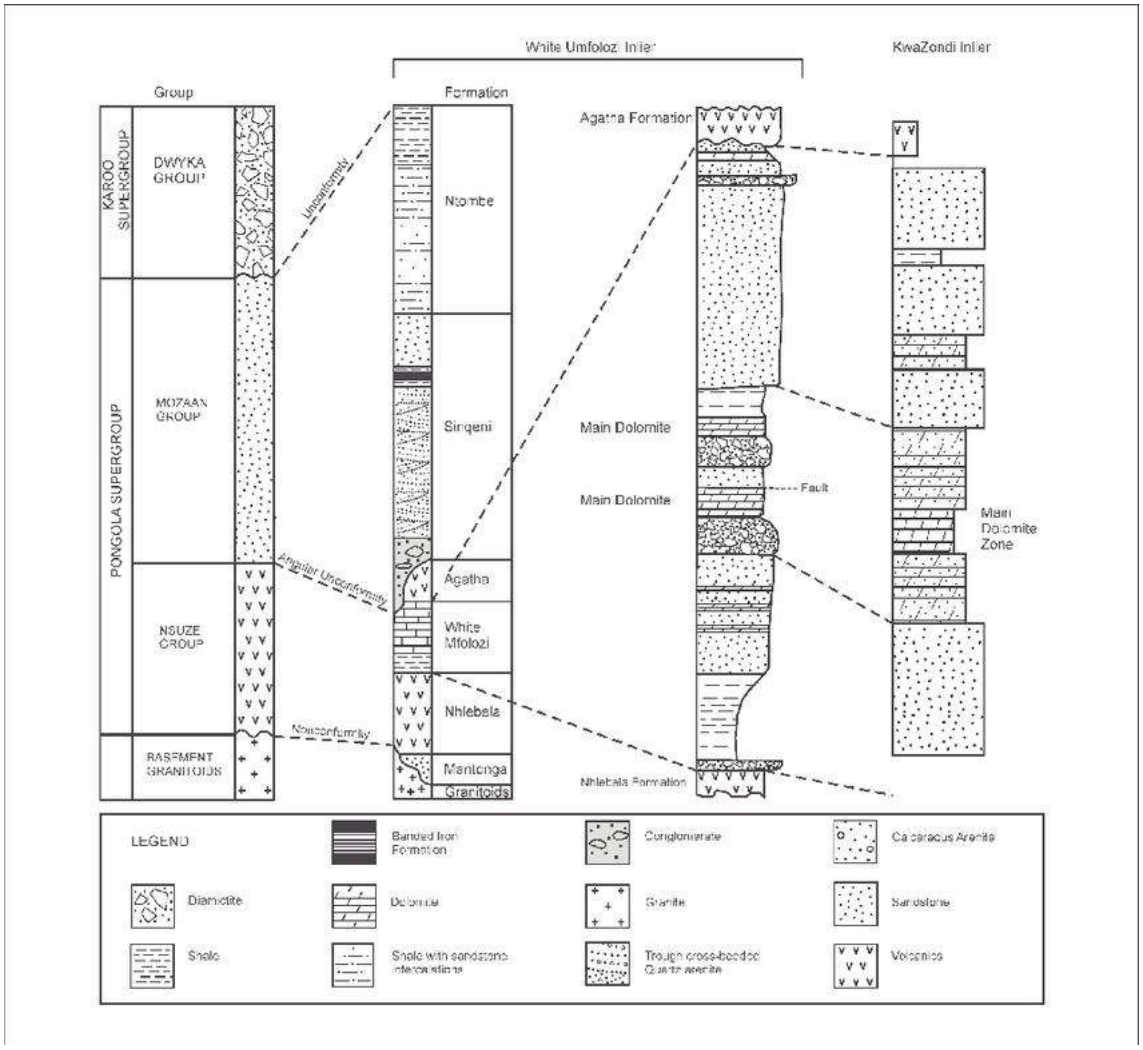

Figure 15: Stratigraphic columns for the Pongola Supergroup with lithological subdivisions within (Source: pongola supergroup stratigraphic column for the white umfolozi inlier - Bing images))

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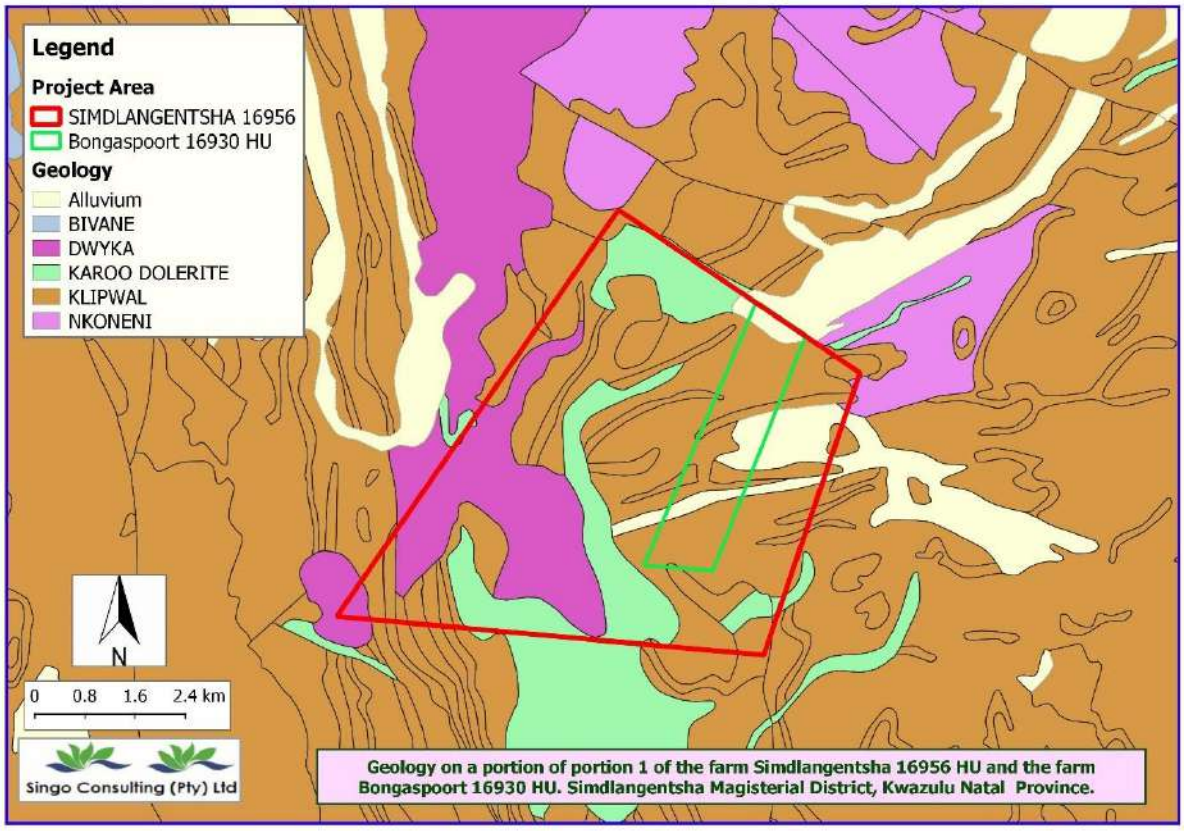

Figure 16: Geological Map

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4 SURFACE WATER IMPACT ASSESSMENT

4.1 Methodology

This section evaluates the potential impact of the proposed development on watercourses present within and around the prospecting site. Watercourse is a term used in the National Water Act (Act No. 36 of 1998) (NWA) that includes various water resources, such as different types of wetlands (both natural and artificial), rivers, riparian habitat, dams, and drainage lines (e.g., natural channels in which water flows regularly or intermittently). Results and discussions of delineated watercourses are used as part of the impact assessment that considers both corridor alternatives separately. Expected watercourse impacts associated with the proposed development is assessed in detail for the construction and operational phases of the project using the approach provided in the Impact Assessment methodology Section below, which includes the provision of recommended mitigation measures. An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need.

4.1.1 Impact Status

Status of Impact

The Impacts are assessed as either having a:

- Negative effect (i.e., at a `cost' to the environment).
- Positive effect (i.e., a `benefit' to the environment).
- Neutral effect on the environment.

4.1.2 Impact Extent

Extent of the Impact:

- Site (site only).
- Local (Site boundary and immediate surrounds).
- Regional.
- National.
- International.

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4.1.3 Impact Duration

Duration of the Impact

The length of the impact will last for is described as either:

- Immediate (<1 year).
- Short term (1-5 years).
- Medium term (5-15 years).
- Long term (ceases after the operational life span of the project).
- Permanent.

4.1.4 Impact Probability

Probability of occurrence

The likelihood of the impact taking place is indicated as either:

- None (the impact will not occur).
- Improbable (probability very low due to design or experience).
- Low probability (unlikely to occur).
- Medium probability (distinct probability that the impact will occur).
- High probability (most likely to occur).
- Definite.

4.1.5 Impact Intensity

Magnitude of the Impact

The intensity or severity of the impacts is indicated as either:

- None.
- Minor.
- (4) Low.
- (6) Moderate (environmental functions altered but continue).
- (8) High (environmental functions temporarily cease).
- (10) Very high / unsure (environmental functions permanently cease).

4.1.6 Impact Significance

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Based on the information contained in the points above, the potential impacts are assigned a significance rating (S). This rating is formulated by adding the sum of the numbers assigned to extent (E), duration (D) and magnitude (M) and multiplying this sum by the probability (P) of the impact.

S= (E+D+M) P

The significance ratings are given below:

- (<30) Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- (30-60) Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- (>60) High (i.e., where the impact must have an influence on the decision process to develop in the area).

4.2 Impact Assessment Ratings and Mitigation Measures

During the prospecting of Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial), Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, and Zinc Ore the following impacts are envisioned:

- Clearing of vegetation leading to increased runoff and less infiltration.
- Diesel and oil spillages from the drill rig.
- Increase in volume of contaminated water that needs to be managed within the footprint.

Siltation on surface water

Footprint clearance will expose bare soil that could result in sheet wash into nearby watercourses during a precipitation event. In addition, dust can further be transported into watercourses or be deposited on infrastructure near watercourses thereby exacerbating the impact of siltation during rainfall events.

Table 3: Siltation mitigation measures

Issue		Impact rating criteria	

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	Corrective measures	Nature	Extent	Duration	Magnitude	Probability	Significance
Siltation of surface water resources	No	Negative	1	1	6	8	64
	Yes	Negative	1	1	2	4	16
Corrective Measures	• Stripping of vegetation for prospecting must occur in a phased manner and must be restricted to the prospecting footprint to reduce the risk of erosion during times of precipitation. • The contractor shall be responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after prospecting has been completed						

Surface water contamination

All chemical substances (oils, and fuels) must be stored in bunded areas, and any spillages must be managed immediately in accordance with the emergency response plan. The emergency response plan must be provided by contractors. This will reduce the risks from high to medium.

Table 4: Surface water contamination and mitigation measures

Issue	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	

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Surface water contamination (Truck oils and fuel could leak and spill)	No	Negative	1	1	6	8	64
	Yes	Negative	1	1	4	6	36
Corrective Measures	• In case of emergencies or unforeseen events, the problem must be remediated immediately and any spillage into any watercourses be reported to the Department of Water Affairs. • Remove all project-related material / support equipment immediately on completion of any of the prospecting phases						

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5 STORMWATER MANAGEMENT PLAN

The goal of the surface water management and monitoring measures is to reduce the impact on surface water-dependent systems within and adjacent to controlled sites, to maintain hydrological regimes of surface water to protect environmental values, and to ensure compliance with license requirements and for reporting purposes.

Water dependent systems are parts of the environment in which the composition of species and natural ecological processes are determined by the permanent or temporary presence of flowing or standing surface water or groundwater. The in-stream areas of rivers, riparian vegetation, springs, wetlands, floodplains, groundwater-dependent terrestrial vegetation are all examples of water dependent systems (Department of Water, January 2013). The objectives of these systems will be achieved if there is no impact on the in-stream and downstream fitness for use criteria.

5.1 Terminology

Stormwater management involves the control of that surface runoff. The volume and rate of runoff both substantially increase as land development occurs. Construction of impervious surfaces, such as roofs, parking lots, and roadways, and the installation of storm sewer pipes which efficiently collect and discharge runoff, prevent the infiltration of rainfall into the soil. Management of stormwater runoff is necessary to compensate for possible impacts of impervious surfaces such as decreased groundwater recharge, increased frequency of flooding, stream channel instability, concentration of flow on adjacent properties, and damage to transportation and utility infrastructure.

5.2 Stormwater Management Principles

The following principles for stormwater management shall guide the planning, design and implementation of stormwater facilities (Centre for watershed, 2010).

- The ecosystems to be protected and a target ecological state will be explicitly identified.
- The post development balance of evapotranspiration, stream flow, and infiltration will mimic the predevelopment balance, which typically requires keeping significant runoff volume from reaching the stream.
- Stormwater control measures (SCMs) will deliver flow regimes that mimic the predevelopment regime in quality and quantity.

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- SCMs will have capacity to store rain events for all storms that would not have produced widespread surface runoff in a predevelopment state, thereby avoiding increased frequency of disturbance to biota.
- SCMs will be applied to all impervious surfaces in the catchment of the target stream.

5.3 Current Stormwater Management

For the proposed prospecting right application, there are no infrastructures (trenches) put in place yet.

5.4 Proposed Stormwater Measures

The proposed stormwater management during the prospecting phase are to ensure that the activity does not influence surface bodies contamination through stormwater. The following measures are proposed.

- The drilling area will be barricaded all around with plastic to ensure that the stormwater during drilling does not encounter wastewater from the drilling process
- Around the drilling area, there will be an impervious surface made, this is to ensure that wastewater from drilling is efficiently channelled and collected. And, stormwater that may have entered the drilling segment area, is correctly harvested by the impervious material and channelled.
- Minimum surface clearance, this will keep the balance of surface water flow prior to the prospecting phase.

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6 MONITORING PLAN

The objective of the surface water management and monitoring measures is to minimise the impact on surface water dependent systems to be retained from disturbance within and adjacent to controlled sites; to maintain hydrological regimes of surface water so that the environmental values are protected and, to check compliance with license requirements and for reporting purposes.

Water dependent systems are parts of the environment in which the composition of species and natural ecological processes are determined by the permanent or temporary presence of flowing or standing surface water or groundwater. The in-stream areas of rivers, riparian vegetation, springs, wetlands, floodplains, groundwater-dependent terrestrial vegetation are all examples of water dependent systems (Department of Water, January 2013). The objectives of these systems will be achieved if there is no impact on the in-stream and downstream fitness for use criteria.

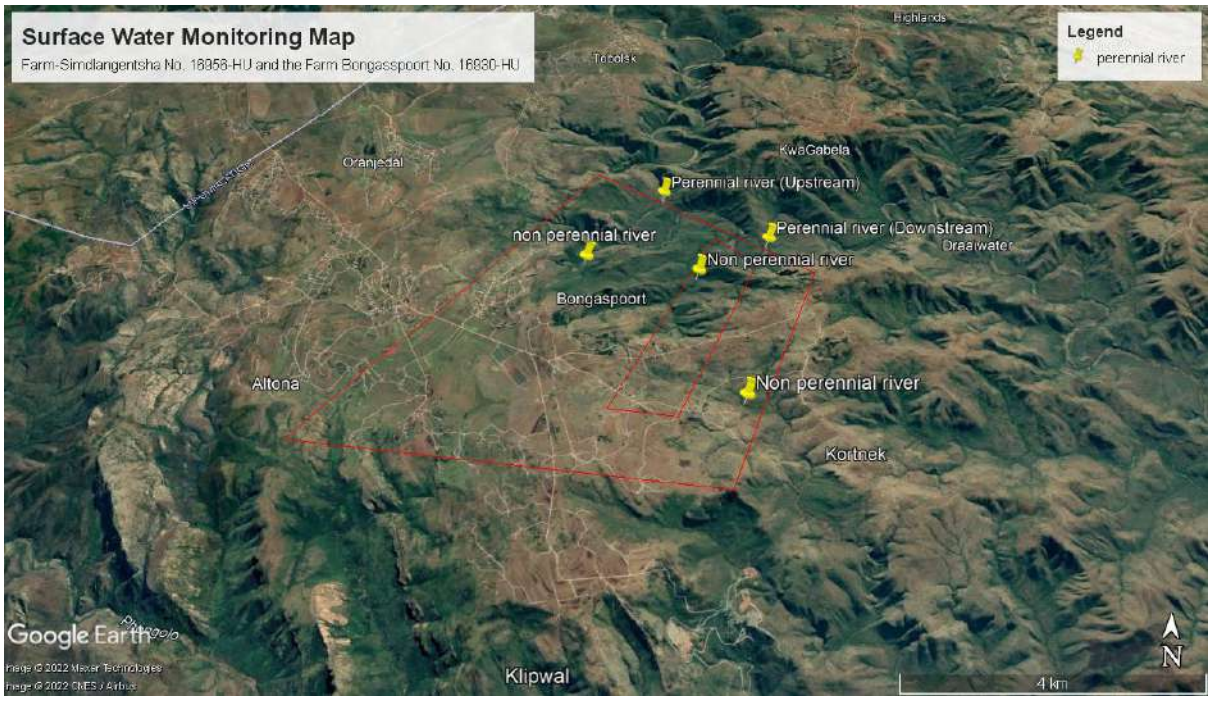

Figure 17: Surface water monitoring map

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7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusion

Singo Consulting (Pty) Ltd was appointed by Ulibo Resources (Pty) Ltd as an independent consulting company, to conduct a basic hydrological study. This study was conducted as a basic study aimed at assisting the EAP and interested parties involved to have a basic background about the project area and the surface water bodies that exist within and nearby the proposed project area. It can be concluded that the area is surrounded by various water bodies, however 100m buffers has been proposed, meaning no activities will take place within 100m from the water bodies. It is recommended that the applicant apply for a water use license in terms of chapter 4, of the National Water Act 36, 1998. This is due to the triggered section 21 c.

- The study area falls within the Usutu to Mhlathuze water management area, situated within the W42J and the W42L quaternary catchment area.
- Diamond drilling activities must not contaminate the water bodies on site.
- Rehabilitation must be ensured after the prospecting activities are done.
- Monthly water monitoring will be conducted to ensure that the prospecting activity is not contaminating the water bodies on site.

7.2 Recommendations

- On site there will be regular maintenance of the mobile toilets.
- Once drilling, the team will rehabilitate the area and ensure the core is out of site.
- Drilling within 100 meters of water resources will be avoided
- Stormwater will be prioritized, and the management to prevent surface water contamination.
- Clearing of vast amount of vegetation will be avoided, this is to preserve infiltration.

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9 REFERENCES

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APPENDICES

Appendix A: Specialist's qualifications

Available Upon Request

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PROSPECTING RIGHT APPLICATION

BASIC HYDROGEOLOGICAL STUDY

Basic Hydrogeological Study for the proposed Prospecting Right Application for Ulibo Resources (Pty) Ltd within portion of portion 1 of the farm Simdlangentsha 15956 HU and the whole Extent of the farm Bongaspoort 16930 HU, under the Magisterial District of Simdlangentsha, KwaZulu Natal Province.

ULIBO RESOURCES (Pty) Ltd
Reg Nr: 2013/099506/07

REPORT PREPARED BY:

Singo Consulting (Pty) Ltd

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DMRE REF: KZN 30/5/1/1/2/11230 PR

Report Credentials.

Disclaimer

The opinion expressed in this and associated reports are based on the information provided by Ulibo Resources(Pty) Ltd to Singo Consulting (Pty) Ltd ("Singo Consulting") and is specific to the scope of work agreed with Ulibo Resources(Pty) Ltd. Singo Consulting acts as an advisor to the Ulibo Resources(Pty) Ltd and exercises all reasonable skill and care in the provision of its professional services in a manner consistent with the level of care and expertise exercised by members of the environmental profession. Except where expressly stated, Singo Consulting has not verified the validity, accuracy or comprehensiveness of any information supplied for its reports. Singo Consulting shall not be held liable for any errors or omissions in the information given or any consequential loss resulting from commercial decisions or acts arising from them. Where site inspections, testing or fieldwork have taken place, the report is based on the information made available by Ulibo Resources(Pty) Ltd or their nominees during the visit, visual observations and any subsequent discussions with regulatory authorities. The validity and comprehensiveness of supplied information has not been independently verified and, for the purposes of this report, it is assumed that the information provided to Singo Consulting is both complete and accurate. It is further assumed that normal activities were being undertaken at the site on the day of the site visit(s), unless explicitly stated otherwise. These views do not generally refer to circumstances and features that may occur after the date of this study, which were not previously known to Singo Consulting (Pty) Ltd or had the opportunity to assess.

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Project details

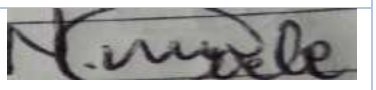
Report type	**Basic Hydrogeological Study for a Prospecting Right Application**
Project title	Basic Hydrogeological Study for the proposed Prospecting Right Application within portion of portion 1 of the farm Simdlangentsha 15956 HU and the whole extent of the farm Bongaspoort 16930 HU, under the Magisterial District of Simdlangentsha, KwaZulu Natal Province.
Mineral (s)	Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial), Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, and Zinc Ore
Client	Ulibo Resources(Pty) Ltd
Site location	Potion of portion 1 of the farm Simdlangentsha 15956 HU and the whole extent of the farm Bongaspoort 16930 HU, under the Magisterial District of Simdlangentsha, Kwazulu-Natal Province, South Africa
Version	1
Date	05 July 2022
	Electronic signatures
	Compiled by
Compiled by	Nndwammbi Mueletshedzi (Hydrogeologist Intern) Singo Consulting (Pty) Ltd 
Reviewed by	Mutshidzi Munyai (Hydrogeologist) Singo Consulting (Pty) Ltd (Water Resources Science (Candidate Natural Scientist), Environment Science (Candidate Natural Scientist) (SACNASP Registration Number 122464) 
Final review and approval	Dr. Kenneth Singo (Principal Consultant of Singo Consulting (Pty) Ltd) 

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Table 1: Critical Report Information

Critical Information incorporated within the Basic Hydrogeological Study:	Relevant section in report
Details of the specialist who prepared the report	Appendix A, P: 42
The expertise of that person to compile a specialist report including a curriculum vitae	Appendix A, P: 42
Project Background Information, including the proposed activities description	Chapter 1, P: 7
An indication of the scope of, and the purpose for which, the report was prepared	Chapter 1. P: 8
An indication of the quality and age of base data used for the specialist report	Chapter 9, P: 39
A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	
The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	June 2022
A description of the methodology implemented in preparing the report or carrying out the specialised process comprehensive of equipment and modelling used;	Chapter 3, P: 10
Details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternative;	Chapter 1, P; 9
An identification of any areas to be avoided, including buffers	Chapter 4, p; 18
A map overlaying the proposed activity including the associated infrastructures on the environmental sensitivities of the site including containing buffer zones	Chapter 4, P: 18
A description of the findings and potential implications of such findings on the impact of the proposed activity or activities	Chapter 5, P; 30
Any mitigation and conditions measures for inclusion in the EMPr	Chapter 7, P;40
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	
An analytic opinion as to whether the proposed activity or portions thereof should be Authorised-i.e. specific recommendations	Chapter 8, P; 42
Regarding the acceptability of the proposed activity or activities; and	
If the opinion is that the proposed activity or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Chapter 7, P; 38
A description of any consultation process that was undertaken during carrying out the study	BAR
Any triggered Water Uses according to section 21 of the National Water Act 36, 1998.	None
Any other information requested by the competent authority.	-

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1 INTRODUCTION

1.1 Background Information

Ulibo Resources (Pty) Ltd (herein referred to as Ulibo) has appointed Singo Consulting (Pty) Ltd as an independent consulting company to conduct a basic hydrogeological study. The hydrogeological study is being conducted in support of a prospecting right application for Manganese Ore, Copper ore, Tin ore, Iron Ore, Nickel Ore, Zinc ore, Rare Earths and Magnesite, Diamond, Cobalt, Diamonds (alluvial) on portion of portion 1 of the farm Simdlangentsha 15956 HU and the whole extent of the farm Bongaspoort 16930 HU , in the Magisterial District of Simdlangentsha, KwaZulu natal Province, South Africa.

The proposed activity has a potential to contaminate the groundwater through possible accident of leakage and infiltration to the sub-surface.

Chapter 3 of the National Water Act (Act 36 of 1998) requires that a person who owns, control, occupies, uses the land is responsible for preventing pollution of water resources and is also responsible to remedy (correct) the effects of the pollution. It is with this Act that the hydrogeological report was deemed necessary for the site to gather all relevant information related to groundwater and its related potential impacts.

Ulibo is planning to prospect for **Cobalt, Copper Ore, Diamond (General), Diamond (Alluvial), Iron Ore, Magnesite, Manganese Ore, Nickel Ore, Rare Earths, Tin Ore, and Zinc Ore** with the application of drilling to recover cores, which will be analysed for further delineation of the minerals of interest and other related lithologies.

The goal of this study:

- Prediction of the environmental impact of the proposed prospecting activity on the geohydrological regime of the area.
- To assess the quality condition of surface and groundwater within and around the prospecting right area, and to draft a water monitoring programme for the project site and provide recommendations
- Forecasting the effects of the activity on the receiving environment.

1.2 Proposed Activities

The activities involved during the life of the project will be in phases, the outlined activities considered are the ones which have the potential of negatively or positively impacting the groundwater regime in the area in terms of quality and quantity.

- Clearing of vegetation to create roads and drilling areas

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- Drilling Process.
- Removal of cores and core logging.

1.3 Scope of Work

The scope of hydrogeological assessment consisted of the following tasks:

- A desktop review and short baseline hydrogeological description of the site area, including review of:
    - Surface water drainage and its potential impact on groundwater.
    - Aquifer characterization.
- Aquifer Classification
- Hydrogeological Modelling
    - Numerical Groundwater flow.
        - Model inputs
        - Model Calibration
        - Scenario Modelling

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2 TERMS OF REFERENCE

The basic hydrogeological assessment for the project area is mainly constructed by a combination of desktop study and site-specific field study. Most of the information used for this study was compiled with an aid of nearby study sites information and experience from similar geohydrological settings. All collected data will be compiled to construct a conceptual geohydrological model.

The following aspects were covered in this hydrogeological study:

Aspect	Description
Desktop Study	➢ Project Initiation and Data Collection ➢ Review available site specific hydrogeological and hydrological information to conceptualize the different aquifer systems and their interaction with surface water features in the area.
Aquifer classification	➢ Aquifers will be classified into either minor or major aquifer types and dominant water source will be identified
Reporting	Writing a comprehensive geohydrological report outlining all the findings and existing environment of the proposed project area. This groundwater specialist report compiles all methodologies, findings, quantitative analysis (geochemical assessment and modelling outcomes), impact assessments, recommendations (proposed monitoring programme and recommended mitigation measures for predicted impacts) and conclusions. Appendices to the specialist report will include laboratory results.

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3 METHODOLOGY

3.1 Desktop Study

Desktop or literature review is defined as a task which involves review of existing research/ information which is relevant to the project needs.

A literature review of all available relevant data was undertaken to provide more data as needed. The data from the literature review was correctly referenced and incorporated into the final research report. Data was compiled using science literature (journals, textbooks, papers, maps, and so on), GIS data from Singo Consulting (Pty) Ltd, DWS, SAWS weather station records, and other relevant scientific work conducted on the subject region. A comprehensive list of all the literature sources utilized in the study report can be found in the reference list.

3.2 Drilling and sitting of boreholes.

Exploration boreholes will be drilled one at a time at various locations throughout the proposed project area. Drill hole depths will average 100 meters and will be determined onsite as the drilling program advances, depending on past hole depths and dips. Between certain wetlands and waterways, a 100-meter buffer will be maintained. A 100-meter buffer must be maintained from public highways.

After the drill site has been gated off, cleared drilling will begin. Following the drilling, immediate rehabilitation will take place. The site will be repaired after each hole is drilled before the drilling crew moves on to the next planned hole. This procedure will be repeated until all planned areas have been drilled. As seen on Figure *1*, the proposed boreholes are located 100 meters away from waterways and infrastructure such as roads.

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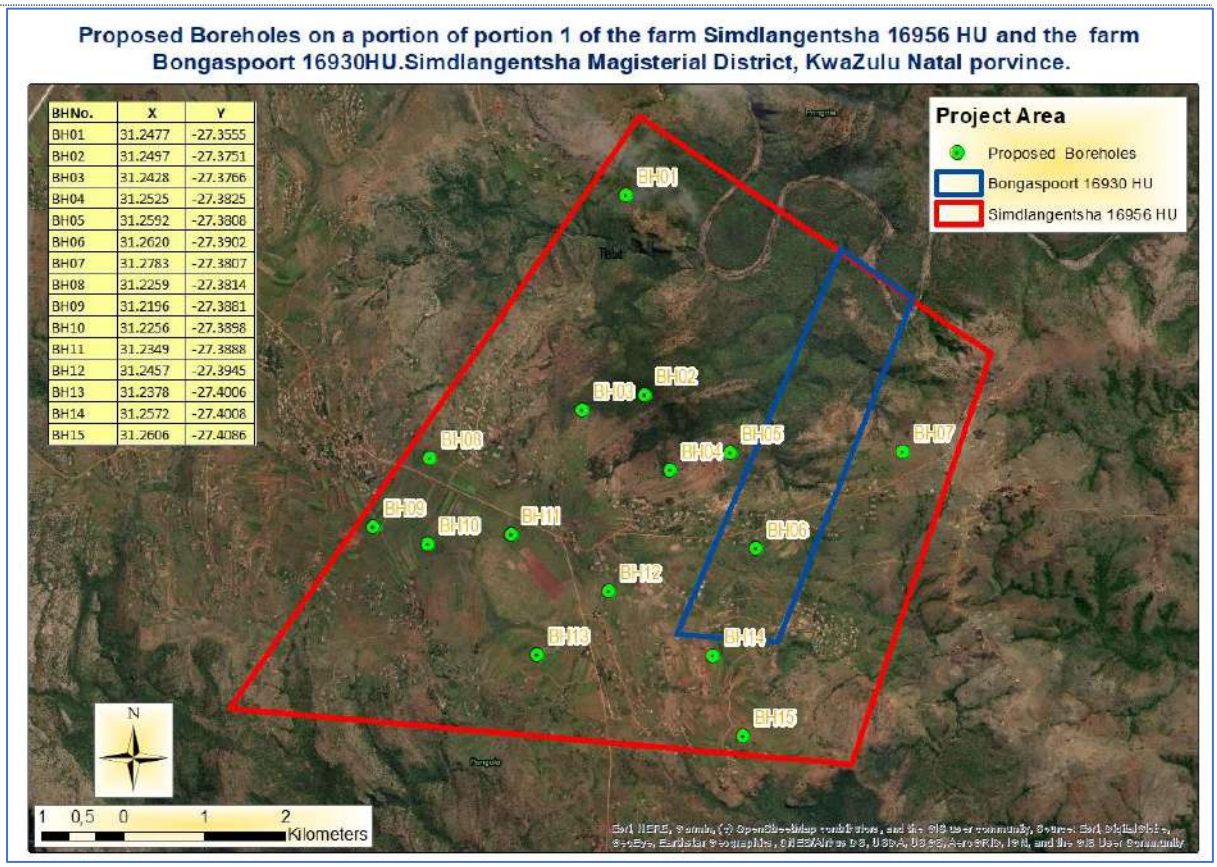

Figure 1: Proposed boreholes

3.3 Groundwater availability assessment

The availability of groundwater as a water source depends largely upon surface and subsurface geology as well as climate. The porosity and permeability of a geologic formation control its ability to hold and transmit water. Porosity is measured as a ratio of voids to the total volume of rock material and is usually described as a percentage. Groundwater accumulates in lithology structures which are fissures, joins, fractures and weathered zones.

Fractured Aquifer System

Groundwater flow within the fractured aquifer is linked to the fracture zones and joints present within the aquifer, and with the interconnectivity of the pore spaces within this aquifer (double porosity aquifer type). Local dolerite intrusions can cause the formation of aquifer compartments, where these intrusions act as groundwater flow barriers, within the fractured aquifer. Contacts between different rocks can form preferential groundwater flow paths along these contacts. Groundwater level data from the monitoring boreholes (between 2016 and 2012) indicated that average water level depths below surface within boreholes of the fractured aquifer ranged between 0.47 m – 3.40 m, with an average of approximately 1.94 m.

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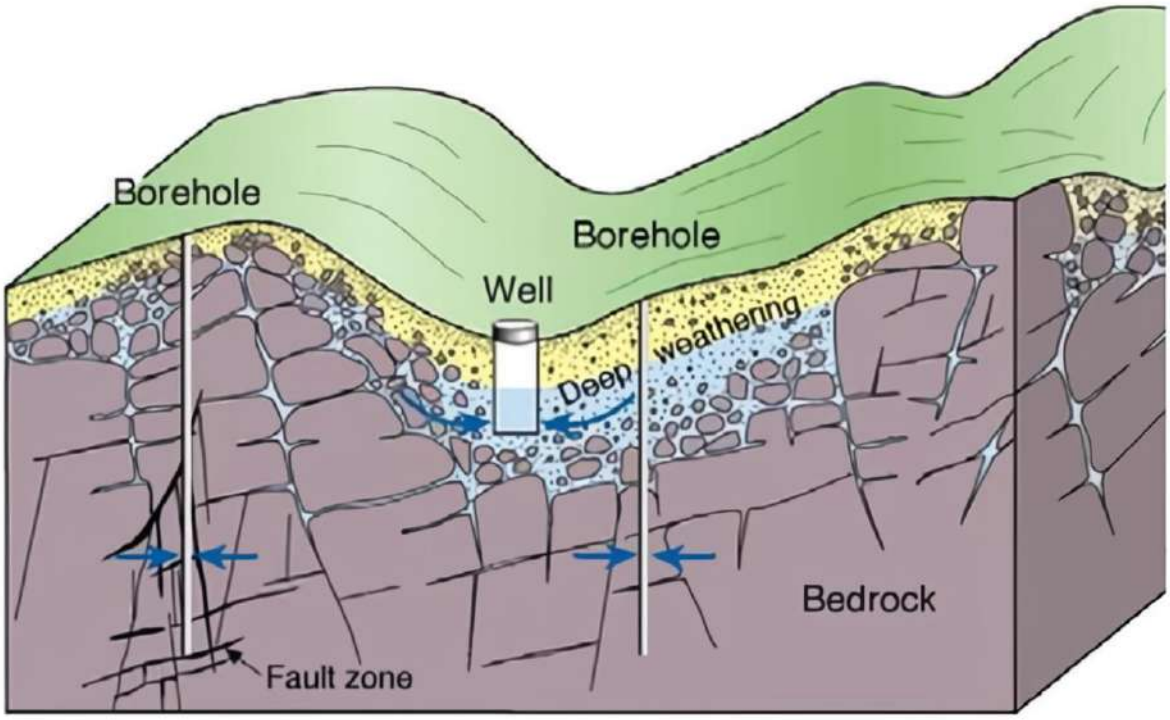

Figure 2: Fault zone and fractured aquifer system.

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4 PHYSIOGRAPHICAL AND GEOLOGICAL SETTING

4.1 Project Location

The locality map created by the QGIS illustrates the location of the proposed area, it is situated on portion of portion 1 of the farm Simdlangentsha 15956 HU and the whole extent of the farm Bongaspoort 16930 HU , in the Magisterial District of Simdlangentsha, KwaZulu natal Province. Approximately 18.13 km north of Louwburg and roughly 32.9 km west of Pongola and about 23,6 km South-West of Belgrade. Accessed via N2.

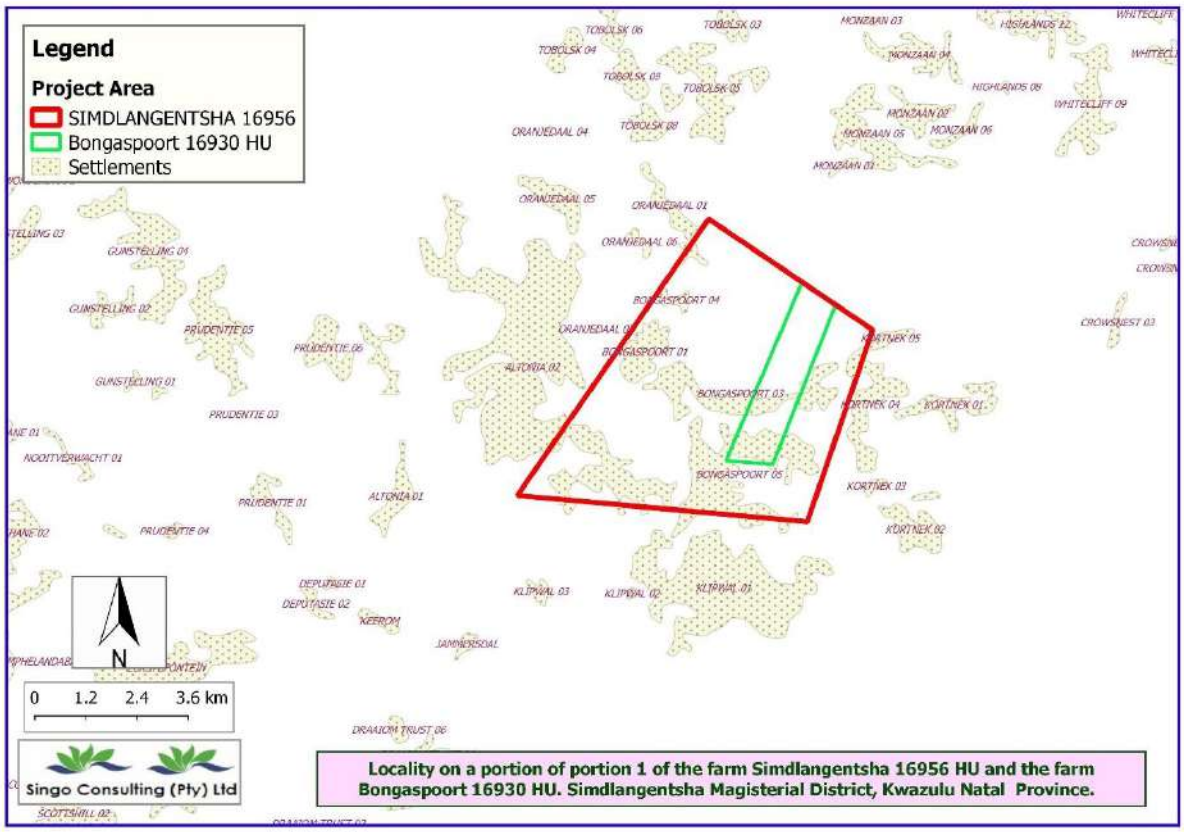

Figure 3: Locality Map of the Study area

4.2 Climate

Simdlangentsha is in the southern hemisphere, with summer months being December, January, February, March. The month with the highest relative humidity is February (71.64 %). The month with the lowest relative humidity is August (56.53 %). The month with the highest number of rainy days is December (15.43 days). The month with the lowest number of rainy days is June (2.13 days). The climate is warm and temperate in Simdlangentsha and the Köppen-Geiger climate classification is Cwa. The average temperature in Simdlangentsha is 20.2 °C. The annual rainfall is 806 mm. and Mean minimum annual temperature of 4.1 – 6 ◦C.

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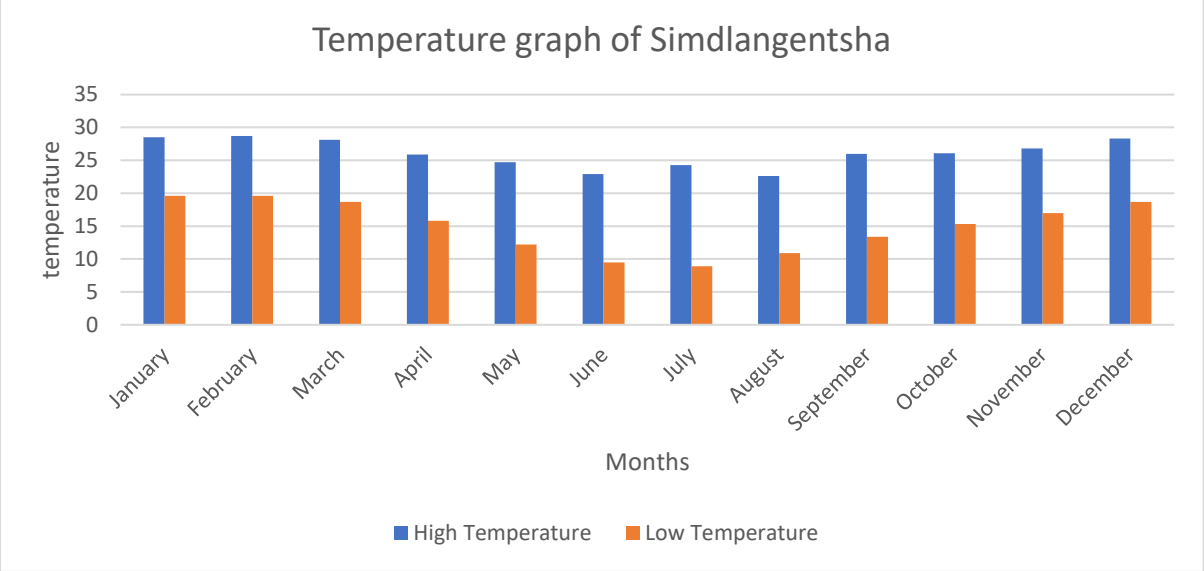

Figure 4: Temperature graph at Simdlangentsha

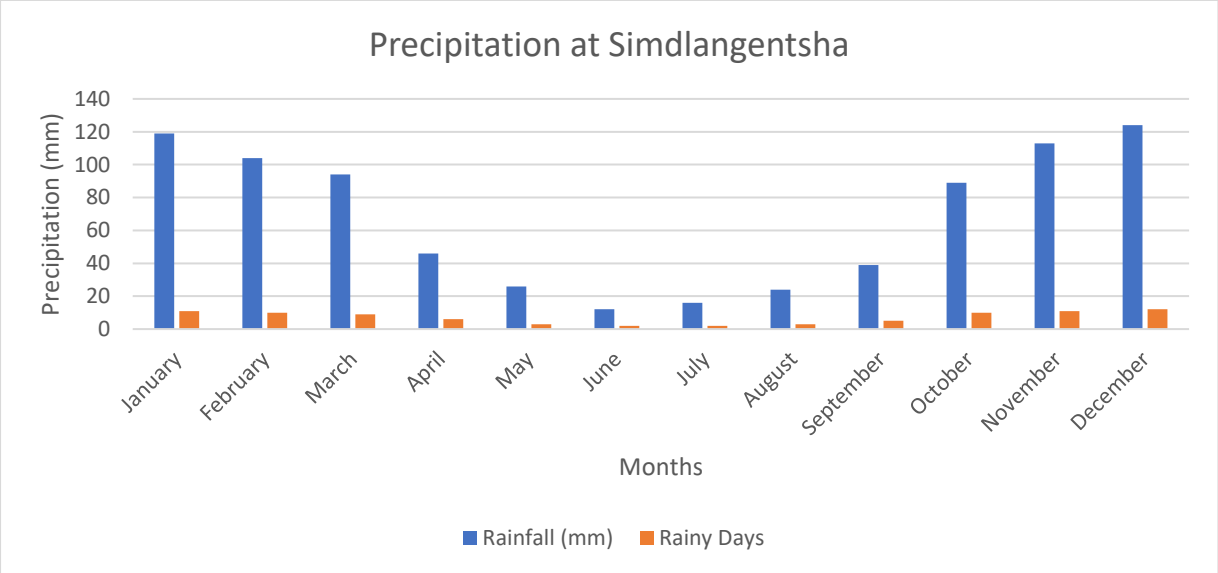

Figure 5: Precipitation graph at Simdlangentsha

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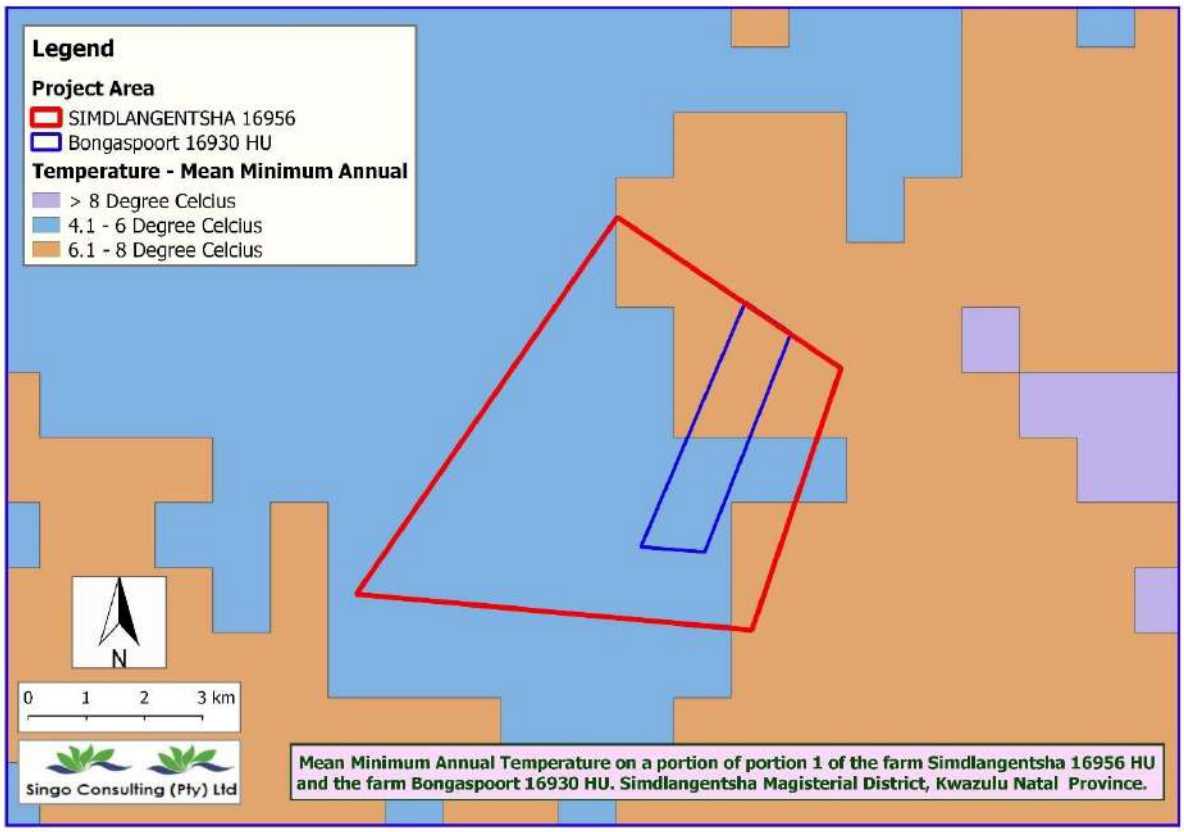

Figure 6: Mean minimum annual Temperature Map

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Figure 7: Mean Annual Rainfall Map

4.3 Topography and Drainage

Topology

The topology of the area is illustrated below by Figure *8* below. A Topographic map is a map which indicates, to scale, the natural features of the Earth's surface, as well as human features, with features at the correct relationship to each other (Oxford Dictionary; 2020). The topography map other than showing landform features, rivers, and associated water resources, it also shows the height above sea level with the use of contour lines. Contour lines are an Imaginary line on the ground surface joining the points of equal elevation.

In this environmental project, topography is used to determine how surface water flows during rainy seasons or how it would flow during the existence of the project. The topography also influences groundwater vulnerability, as topography also influences run-off and infiltration rate by means of residence time.

The study area is located on a mountainous region with undulating slope, this is seen by closely spaced contours. The contour interval is 20m. The landforms identified in the study area are:

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- **Mountains :** An area of land that rises very high above the land around it and that is higher than a hill, characterized by peaks that are not flat**.** in the northern direction of the study area, mountain ranges were observed, ranging between 640 -940 mamsl in elevation.
- **Valley :** A low area of land between hills or mountains, typically with a river or stream flowing through it. The valleys observed channel perennial river in the northern direction and other non-perennial river that drains towards the northern direction.

Types of slopes found in the study area.

- **Concave Slope :** The slope is very gentle at the foot, and it goes on getting steeper and steeper towards the top. The concave slope is found in the southwest direction from the center of the study area. The elevation ranges between 800 – 920 mamsl.
- **Convex Slope :** The slope is very steep at the foot, and it goes on becoming gentle towards the top. In the study area, the slope is located in the north-western direction from the center of the study area ranging from 660 – 860 mamsl in elevation.

Upon analysis of the topography of the study area, the study area is mostly characterized by steep slopes in the northern direction, with minor gentle slopes towards the southern direction of the study area.

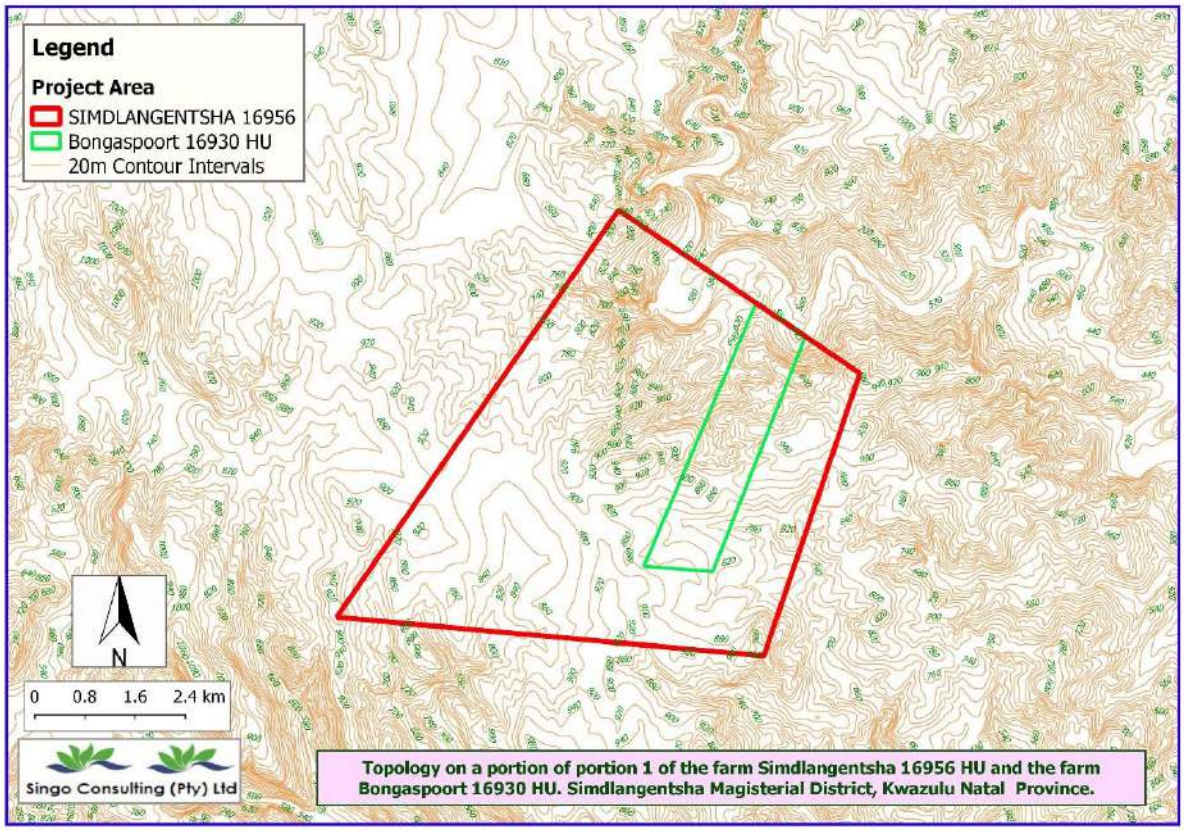

Figure 8: Topography of the study area

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Drainage

The hydrology surrounding the proposed area is of vital importance. In this context hydrology is all the surface waters appearing within and nearby the proposed project area, where a potential to be impacted upon by the project existence. The hydrology map Figure *10*, illustrates that the following water bodies exists within and nearby the project area:

- **Perennial River:** Defined as a river that flows throughout all seasons. In the study area, the perennial river is found in the northern direction at an elevation of 520 mamsl. The river is flowing towards the eastern direction, along the valley.
- **Non-perennial river:** Defined as a river that flows on certain seasons of the year, which in most cases is summer season. The identified rivers in the northern direction, flow towards northeastern direction at an elevation of 600 mamsl and drain into the perennial river.

Drainage Pattern in the study area is dendritic pattern as seen on Figure 9 made as a result of the non-perennial rivers found within the study area.

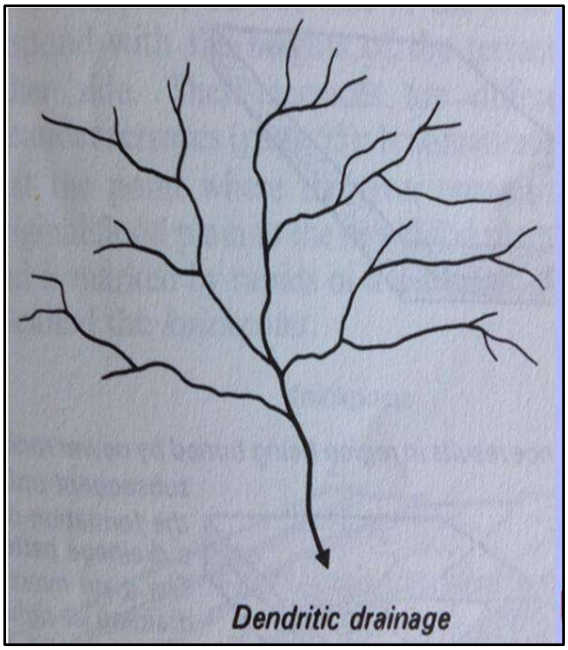

Figure 9: Dendritic Pattern (Source: Dendritic patterns - Bing images)

There will be procedures and guidelines put in place for this project to avoid the risk of water contamination through onsite and nearby water resources, such as ensuring strict management of waste material and buffering. It will be advised on more mitigation measures to ensure the waterbodies as seen on the hydrology map are not contaminated. As shown in Figure *11*.

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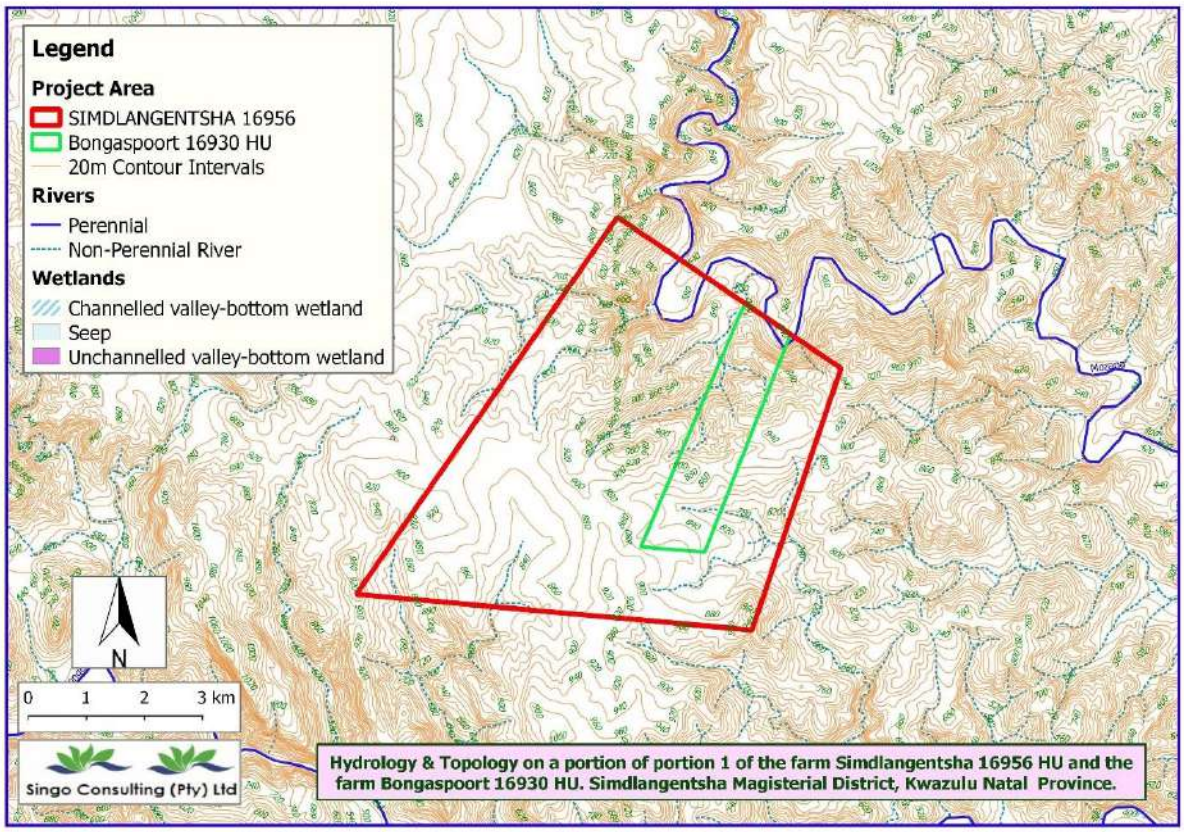

Figure 10: Hydrology Map of the study area

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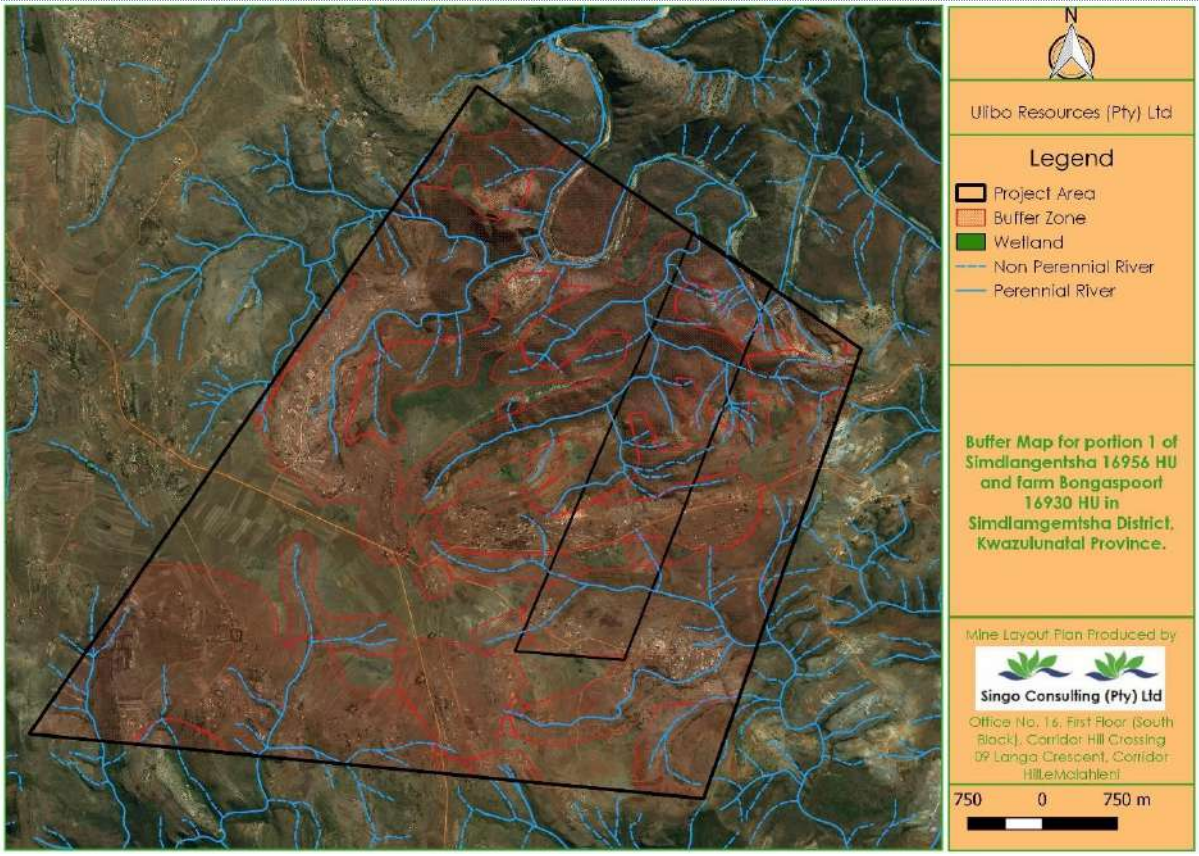

Figure 11: Buffer map of water bodies onsite

4.4 Catchment Information

The study area falls on Quaternary Catchment W42L and W42J under the Usutu -Mhlathuze Management Area. The Usutu to Mhlathuze WMA is situated in the northern KwaZulu-Natal province, but also occupies the south-eastern corner of the Mpumalanga province, west of Swaziland. The WMA borders on Mozambique and Swaziland and two of its major rivers, the Usutu and the Pongola are shared with these countries. The WMA is bordered by the Indian Ocean in the east and the Drakensberg range in the north-west. Altitude ranges from over 2 000 m to sea level. Rainfall varies from almost 1 500 mm/annum in the mountainous areas in the west to as low as 600 mm/annum on the Makhathini flats where the Lebombo mountains create a rain shadow.

The WMA consists of a number of catchments which are mostly independent of each other. As a result, separate and mostly independent strategies are required to manage each catchment. The main catchments are the Mhlathuze, Mfolozi, Mkuze, Pongola, Usutu and Lake Sibaya catchments (DWAF, 2014)

Water Management Area	Quaternary Catchment	Area of the quaternary catchment (KM^2)	MAP within the catchment (mm)	Evaporation Zone	MAE
Usutu-Mhlathuze water management	W42L	251	764	13A	1400
Usutu-Mhlathuze water management Area	W42J	290	756	13A	1400

Table 2: WRC 2012 Report, WMA, QC

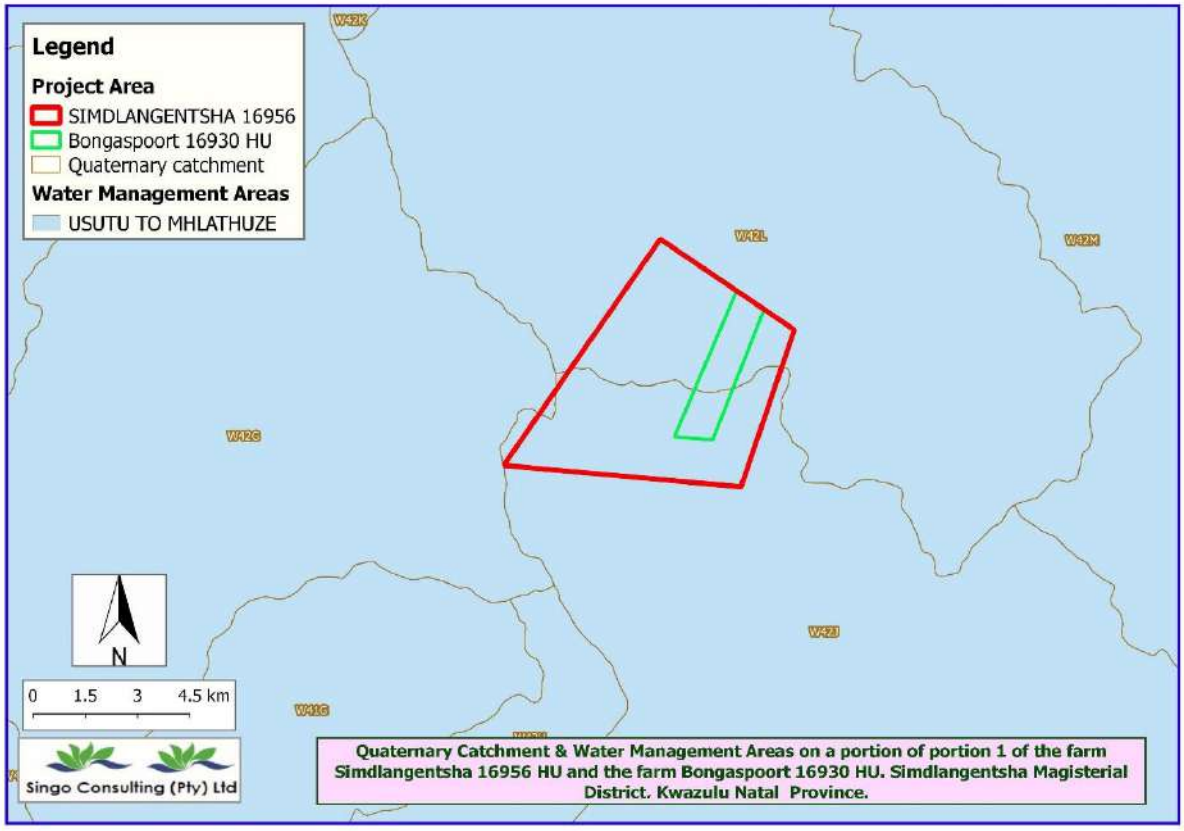

Figure 12: Quaternary Catchment of the study area

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4.5 Geology

Regional Geology

The project area is covered with rocks of the Karoo Supergroup with outcrops of the Pongola Supergroup (Northern Region). The proposed project area consists mainly of the klipwal, karoo dolerite and Dwyka geology. Multiple sedimentary sequences, up to and over 300 m thick, and comprising the Late Palaeozoic Dwyka Group in the southeastern part of the African subcontinent, were deposited during deglaciation of the Gondwana ice sheet. Attention is focused on the northern part of KwaZulu/Natal in South Africa where the Dwyka Group, represented by glaciogenic deposits, rests on an uneven surface of Archaean basement rocks. These deposits occur on the north-western flank of an elongate pre-Dwyka crustal downward which had a significant influence on the mode of sedimentation as it progressively subsided.

The sedimentary part of the Karoo Supergroup is subdivided into four main lithostratigraphic units, which from the base up are the Dwyka, Ecca, Beaufort and Stormberg (Molteno, Elliot and Clarens formations) groups (Johnson et al., 1996; SACS, 1980). These are capped by some 1.4 km of basaltic lavas of the Drakensberg Group (Johnson et al., 1996; Veevers et al., 1994), the extrusion of which is related to the break-up of Gondwana (Cox, 1992). The Karoo aged depositional environments broadly range from glacial (Dwyka Group), to shallow marine and coastal plain (Ecca Group), to nonmarine fluvial and aeolian (Beaufort and Stormberg groups). Whilst this paper focusses on the Ecca and Beaufort groups and Molteno Formation sedimentary successions, a review of the variable basement lithologies and Dwyka Group is also pertinent.

Local Geology.

Dwyka Group

The Dwyka Group is composed of sediments derived from glacial activity on Gondwana 270Ma ago (evidence provided by numerous glacial pavements in the Northern and Central Regions). The Dwyka Group forms the lowermost and oldest deposit in the Karoo Supergroup basin. The Karoo Basin extended across much of southern Gondwana and records 120 million years of geological history. The tillite in KZN often weathers to a characteristic yellowish colour. The formation is found covering the Pongola Supergroup throughout the Northern, Central and Southern Regions. The Dwyka sediments were deposited on a rugged palaeotopography scoured out by moving glaciers. The formation consists predominantly of characteristic tillite,

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as well as diamictites (of undetermined origin), siltstones and sandstones (Armstrong, 1980; Groenewald, 1984).

The distinctive character of the Dwyka Group in northern KwaZulu/Natal is partly attributable to the complex tectonic setting in which it occurs and reflects an interplay of various factors that controlled the styles of sedimentation during deglaciation. Rapid dissipation of the ice in the closing stages of deglaciation was followed by accumulation of postglacial muds which mantled the glaciogenic sediments. In the northernmost part of the study area proximal products of deglaciation, represented by conglomeratic deposits and associated sandstones, are preserved in deep partly exhumed glaciated valleys and depressions along the southern periphery of the Archaean upland. The distinctive character of the Dwyka Group in northern KwaZulu/Natal is partly attributable to the complex tectonic setting in which it occurs and reflects an interplay of various factors that controlled the styles of sedimentation during deglaciation.

The lower mudstone unit is overlain by 3 m of well banded, Superior-type banded iron formation. Microbands of iron oxides are interlayered with bands of jaspilite, the former being predominantly magnetite. Microbands are separated by sharp contacts, with bands ranging in thickness from 1 to 5 cm in thickness. Microbands 1 to 3 mm thick are often present within jaspilitic microbands. The banded iron formation is overlain with a gradational contact by ~3 m of foliated green shale. The Karoo Dolerites associated with the Drakensberg Group lavas, are found throughout the Northern, Central and Southern Regions of Pongola Supergroup.

Klipwal

The Klipwal formation is of the Mozaan Group in the Pongola Supergroup. The Mozaan group together with the correlative Witwatersrand Supergroup host the oldest, best-preserved cover successions deposited on a stable craton between 2.96 – 2.84 Ga ago, it is associated with post Pongola granites which intruded the Pongola Supergroup during this interval. Little is known about the tectonic processes which operated on the young Earth in the Archean. Palaeomagnetism remains the most robust method with which early cratonic movements can be constrained. There is a poor paleomagnetic record for the Kaapvaal Craton during the Archean. The geochemical data suggests a strong mafic to ultramafic source with minor felsic input. The CIA is consistent with moderate weathering which probably took place at the source. The elevated levels of iron are attributed to the precipitation of ferric-oxyhydroxides from the anoxic seawater with a high concentration of dissolved iron. Petrographic and field studies suggest that sediments were sourced from an off-craton greenstone terrane adjacent

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to the Witwatersrand – Mozaan basin indicating that the extent of glaciation was more extensive than previously thought.

Bivane

The Bivane Subgroup is predominantly volcanic containing both lavas and pyroclastic rocks. It is named after the Bivane River, a tributary of the Pongola River, in northern KwaZulu-Natal, which cuts through the entire section of volcanic rocks from west to east. The proportion of sedimentary rocks to volcanic rocks increases progressively from north to south. The Bivane Formation which conformably overlies the Chobeni Formation is a thick succession of amygdaloidal lavas of basaltic, andesitic and dacitic composition. Pyroclastic rocks, pahoehoe, and ropy lava structures near the base of the formation indicate a predominantly sub-aerial extrusive environment. The subgroup is divided into the volcanic Nhlebela Formation at the base, the sedimentary White Mfolozi Formation, followed by the volcanic Agatha Formation at the top of the subgroup. The White Mfolozi Formation is laterally impersistent in the Northern Region.

Nkoneni Subgroup

The top of the Mozaan group consists of three that constitute the 600m Nkoneni subgroup, its lowermost formation is the Bongaspoort formation which is 250m thick it is composed of coarsening-upwards metasandstone and quartzwackes deposited on a sandy fluvial braid plain (Beukes & Cairncross 1991) the central 100 to 800m thick and predominantly the volcanic Gabela formation is characterized by pyroclastic rock including andesitic and dacitic tuff as well a fragmented komatiite interbedded among sandstone and shale (Wilson & Zech, 2018).the uppermost 150m thick Ntanyana formation is composed of both coarse grained sandstone and magnetic shale of fluvial and marine origin (Gold 2006).

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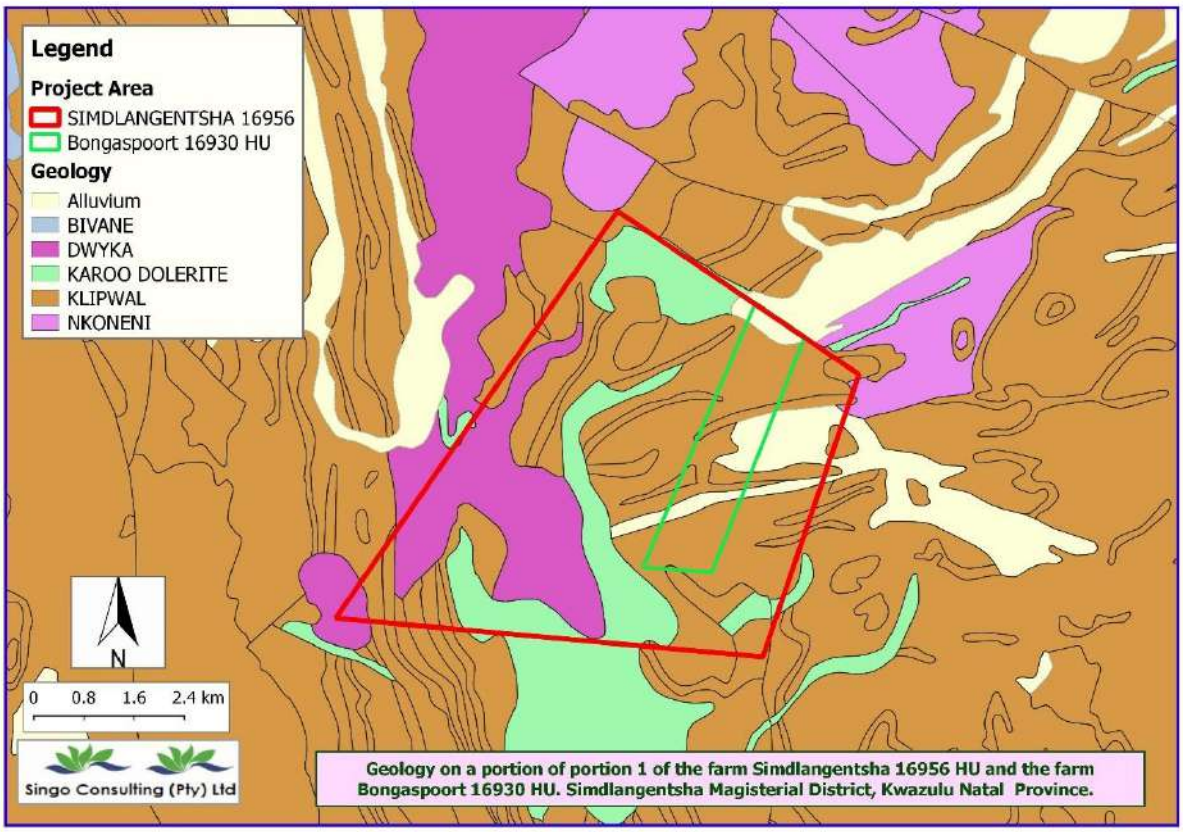

Figure 13: Geology map of the study area

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5 GROUNDWATER INVESTIGATION

5.1 Hydrogeology

Typically, five distinct aquifer types:

- Basement (fractured Achaean-Proterozoic igneous/ metamorphic)
- Hard rock (e.g., Table Mountain TMG, Waterberg, and Natal Groups sandstone; fractured)
- Karst/ dolomite (dissolution)
- Karoo (fractured and influenced by dykes)
- Porous (intergranular Quaternary alluvial, coastal, Aeolian and other surficial unconsolidated deposits)

The study area falls under the **Karoo (fractured and influenced by dykes).** For effective borehole yields, the boreholes must target the fracture zones in this area.

Regional Groundwater Occurrence and Aquifers.

Based on the geology within the study area, the structural geology, and the geomorphology, the following conditions can arise to enhance aquifer development within the study area:

- The fractured transition zone between weathered and fresh bedrock
- Fractures along contact zones between the host rocks due to heating and cooling of rocks involved with the intrusions
- Contact zones between sedimentary rocks of different types
- Interbed or bedding plane fracturing
- Openings on discontinuities formed by fracturing
- Faulting due to tectonic forces
- Stratigraphic unconformities
- Zones of deeper weathering
- Fractures related to tensional and decompressional stresses due to off-loading of overlying material
- Groundwater occurs within the joints, bedding planes and along dolerite contacts. Groundwater potential is generally low in these rocks, with 87% of borehole yields < 3 l/s.

The lithology sandstone make up the fractured Ellisras aquifer. The pores of the geological units are generally strongly cemented, and fractured flow over secondary structures such as faults, bedding plane fractures, and so on is the primary flow mechanism. Due to the establishment

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of cooling joints, the intrusion of dolerite dykes and sills into the fractured aquifer has resulted in the formation of preferential flow routes along the contacts of these lithologies. The dykes may operate as permeable or semi-permeable barriers to prevent water from flowing across them.

5.2 Potential Contaminants

Because this activity will only take place for a brief period of time, the possible pollutants for Manganese Ore, Copper ore, Tin ore, Iron Ore, Nickel Ore, Zinc ore, Rare Earths and Magnesite, Diamond, Cobalt, Diamonds (alluvial) prospecting are limited and can be easily handled. The following contaminants are expected to be of concern during the prospecting activity.

- Leakage of sewage waste into the soil and flowing to the nearby water resource.
- Hydrocarbon spill into the soil
- Water used as cooling agent of the drill bit
- Removal of the core, residual core might be left on the surface, during rainfall, there is more likely to be leaching of heavy metals.

5.3 Groundwater sources and sinks

Following the characterization of the aquifers, contaminant sources and groundwater receptors, the conceptual model was transformed into a numerical model so that the groundwater flow conditions, and mass transport can be solved numerically. A conceptual model is a simplified, but representative description of the groundwater system that illustrates the interaction of the sources, pathways, and receptors at the site.

The SPR conceptual model was first used in the field of environmental engineering in the late 1970"s to describe the flow of environmental pollutants from a source, through different pathways to potential receptors (Holdgate, 1979). Since then the model has been used in several environmental risk assessments (e.g., Environment Agency, 2004, Scottish Government, 2010, Sneddon et al., 2009).

- The **sources** represent any entity that contributes to the groundwater quantity and/or quality
- The **pathways** are the aquifers through which the groundwater and contaminants migrate and
- The **receptors** are humans, rivers or natural ecosystems that depend on the groundwater and will be impacted negatively if the water is depleted by dewatering or is contaminated.

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6 AQUIFER CHARACTERIZATION

6.1 Groundwater vulnerability

Vulnerability of groundwater is a relative, non-measurable, dimensionless property (IAH, 1994). It is based on the concept that "some land areas are more vulnerable to groundwater contamination than others" (Vrba and Zaporozec 1994).

The main concerns in terms of possible groundwater contamination from the proposed prospecting activity are as follows:

- During the construction phase, Total Petroleum Hydrocarbon (TPH) contamination is possible due to the presence of heavy machinery on site. Spillages may occur which may impact both the soil and groundwater environment.
- During the prospecting phase, potential contamination may arise due to the drilling wastewater.

Because of the ensuing possibility of possible groundwater contamination from the sources or risks mentioned above, the aquifer's vulnerability is analysed. The following evaluation methodology was used to establish the aquifer's vulnerability to various pollution sources:

Method 1: Aquifer Vulnerability Rating (DRASTIC Method).

Method: 1 evaluates and rates seven key parameters within the hydrogeological setting to determine a final aquifer vulnerability rating.

Aquifer Vulnerability Rating (Drastic Method)

In the DRASTIC method, aquifer vulnerability is determined within hydrogeological settings by evaluating seven parameters denoted by the acronym:

- **D**epth to groundwater – Determined from DWA, GRA2 data, confirmed with a hydrocensus,
- **R**echarge – Obtained from DWA, GRA2 data
- **A**quifer media – Determined from geological maps and test pit profiles
- **S**oil media – Determined from test pit profiles
- **T**opography – Determined by digital elevation data
- **I**mpact on vadose zone – Determined from geological maps and test pit profiles
- Hydraulic **C**onductivity – Protocol to Manage the Potential of Groundwater Contamination form on-site Sanitation (DWAF, 1997).

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Each of the parameters is weighted according to its relative importance. The DRASTIC Index is determined by rating each parameter according to a set of tables, multiplying the assigned rating by the parameter weighting and summing the resulting products. The higher the DRASTIC Index; the higher the vulnerability to contamination .

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Parameter	Effect	Rating										Weight	Site rating	Score
		1	2	3	4	5	6	7	8	9	10			
Depth to Water	Increasing depth to water increases time for natural attenuation or remediation of contaminant	> 33m	25 - 33m	17 - 25m		10 - 17m		5 - 10m		2 - 5m	0 - 2m	5	5	25
Recharge	Increasing recharge leads to faster movement of contaminant	0 - 10mm/a	10 - 25mm /a	25 - 37mm/a		37 - 50mm/a	50 - 75mm/a	75 - 110mm/a	110 - 160mm/a	160 - 200mm/a	>200mm/a	4	8	32
Aquifer Media	Increasing porosity increases movement of contaminants		Compact sedimentary rocks with widely spaced fractures	Igneous and/or crystalline metamorphic rocks: fractured	Igneous and/or crystalline metamorphic rocks: fractured and weathered	Compact sedimentary rocks: fractures directly below groundwater level		Compact sedimentary rocks: weathered and fractured	Massive dolomite / limestone. Sand and Gravel		Fractured dolomite / limestone with solution channels	3	4	12
Soil media (Drainage)	increasing soil drainage decreases time for natural attenuation or remediation		Clay loam and silty clay	Silty clay loam, sandy clay and silty loam	Sandy clay loam and loam	Sandy loam	Sandy loam	Shrinking and/or aggregate clay. Loamy sand	Sand. Shrinking and/or aggregate clay	Sand	Sand	2	4	8
Topography (%Slope)	increasing slope promotes runoff and decreases downward contaminant movement	> 18		12 to 18		6 to 12				2 to 7	0 - 2	1	10	10

Impact of the Vadose Zone	Increasing vadose zone conductivity decreases time for natural attenuation or remediation of contamination		Mainly compact tillite	Mainly compact tillite and shale. Lava and Intrusive	Mainly compact tillite, shale and sandstone. Assemblage of compact sedimentary strata, and extrusive and intrusive rocks	Compact sedimentary strata	Compact, dominantly arenaceous strata	Consolidated porous to compact sedimentary strata		Porous unconsolidated to semi consolidated sedimentary strata	Dolomite, chert, subordinate limestone	5	5	25
Hydraulic Conductivity	Increasing vadose zone conductivity decreases time for natural attenuation or remediation of contamination	0.03 - 0.69m	0.69 - 1.35m	1.35 - 2.02m	2.02 - 2.68m	2.68 - 3.34m	3.34 - 10m				>10m	3	10	30
Final Score														130

Table 3: DRASTIC model table rating for the aquifer underlying the study area.

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The vulnerability index score (DRASTIC index) for the site is 130. Below is a classification table indicating the class description for the index range.

Index Range	Class name
≤ 89	Very Low
90 - 105	Low
106 – 140	Medium
141 – 186	High
187 – 210	Very High
≥ 211	Extremely High

Table 4: aquifer vulnerability table of the aquifer at Pongola.

The aquifer vulnerability from possible pollution sources is classed as "Medium". A Medium potential or likelihood for possible contaminated fluids originating from the site to reach the groundwater table exists. A Medium aquifer protection level is therefore recommended. As seen on the Figure *14*, the likelihood of groundwater contamination attributed to the material above the ground water table is classified as Medium.

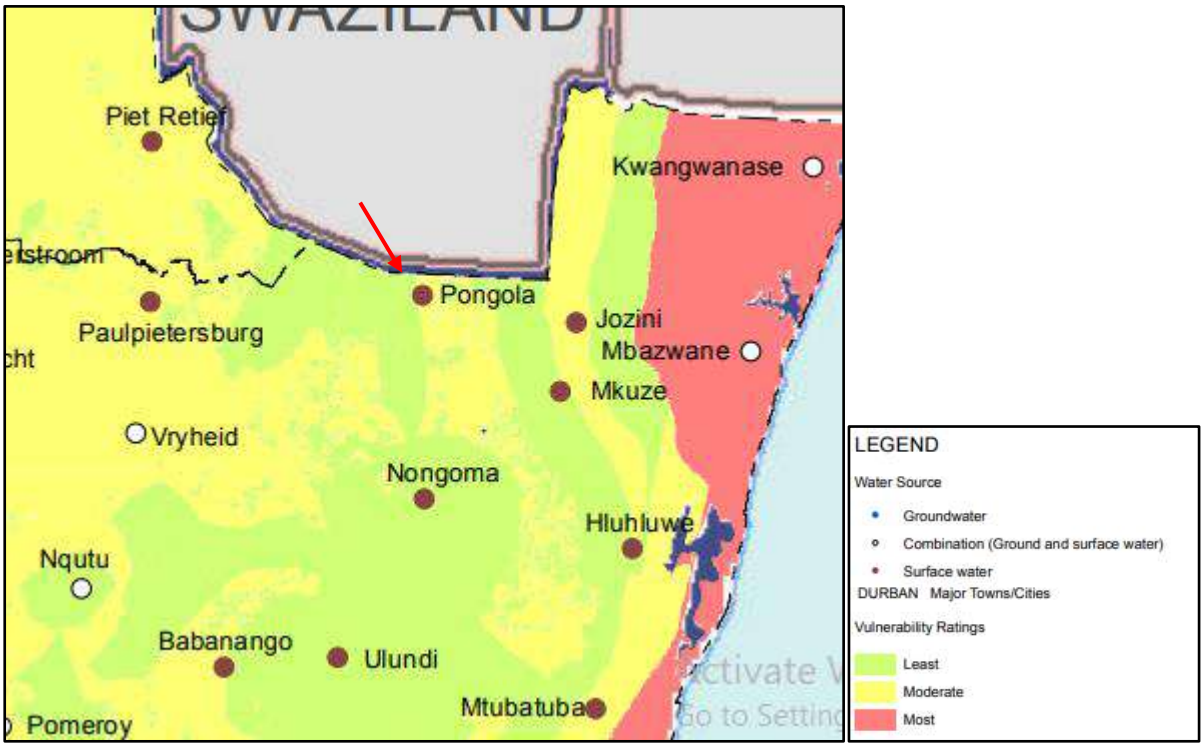

Figure 14: Aquifer Vulnerability of Delmas (Vegter & Seymour, , 2012)).

6.2 Aquifer classification

The *Figure 15* below illustrates aquifer classification of different areas in South Africa. It can be deduced that the project area at **magisterial district of Pongola** comprises of minor aquifers and the dominant water source is surface water. Table 5 interprets the meaning of the aquifer

classification and when an area is said to have minor aquifer it means that the aquifer is low yielding or unacceptable quality aquifer.

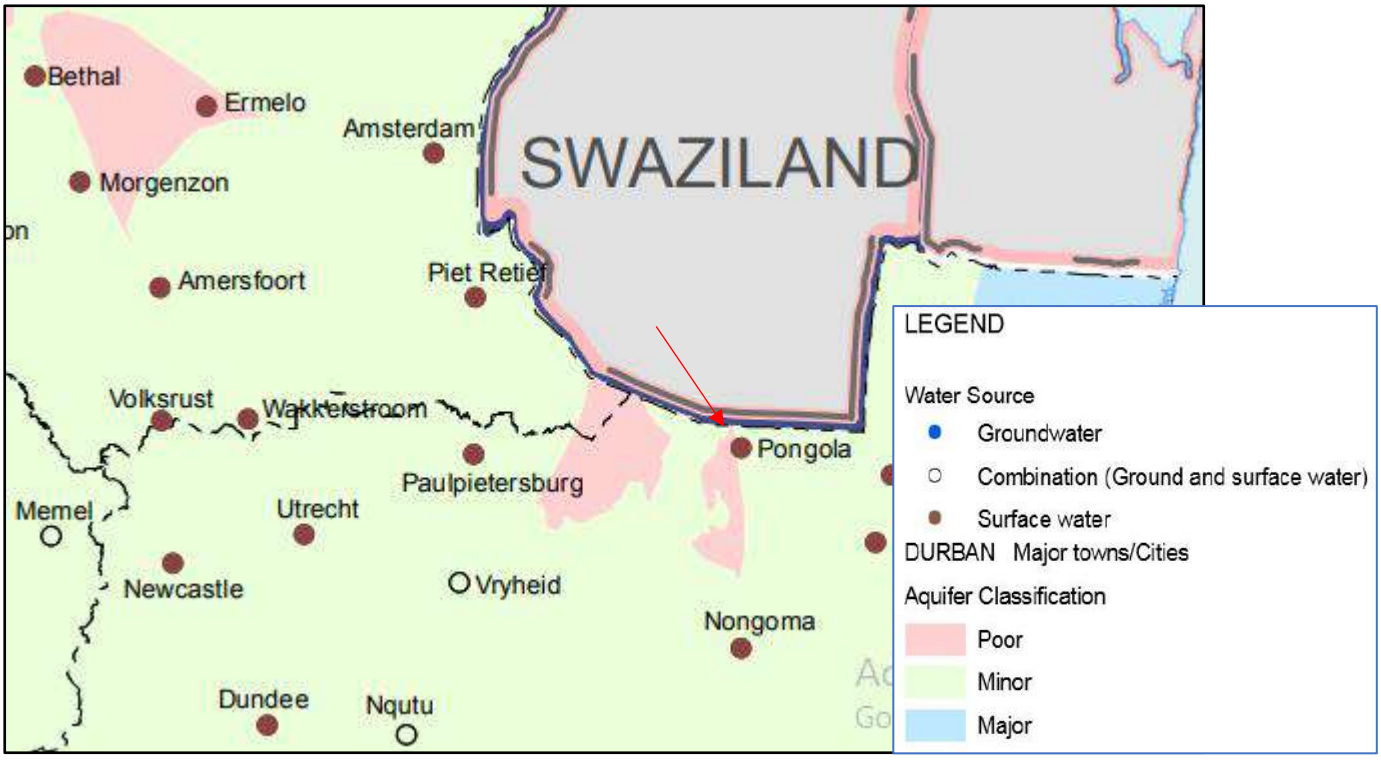

Figure 15: Aquifer Classification of the study area (Source: : (Vegter & Seymour, , 2012)).

Sole source aquifer	An aquifer used to supply 50% or more of urban domestic water for a given area, for which there are no reasonably available alternative sources should this aquifer be impacted upon or depleted.
Major aquifer region	High-yielding aquifer of acceptable quality water.
Minor aquifer region	Moderately yielding aquifer of acceptable quality or high yielding aquifer of poor-quality water.
Poor aquifer region	Insignificantly yielding aquifer of good quality or moderately yielding aquifer of poor quality, or aquifer that will never be utilised for water supply and that will not contaminate other aquifers.

Table 5: Aquifer characterization

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7 HYDROGEOLOGICAL IMPACT ASSESSMENT AND MANAGEMENT PLAN

7.1 Prospecting Phase Impacts

During the prospecting phase of Manganese Ore, Copper ore, Tin ore, Iron Ore, Nickel Ore, Zinc ore, Rare Earths and Magnesite, Diamond, Cobalt, Diamonds (alluvial) , the following impacts are envisioned:

- Clearing of vegetation leading to increased runoff and less infiltration.
- Diesel, oil and petrol spillages from the drill rig and site vehicles, and leaks from mobile toilets leads to soil contamination and water resource contamination (Groundwater and Surface water)
- Increase in volume of contaminated water that needs to be managed within the footprint.
- Increase in waste in the prospecting area (Metal and non-metal).
- Compaction of soil leading to increase in run-off, and decrease in infiltration, impacting groundwater quantity.

7.2 Management Measures

- All spillages will need to be cleaned up as soon as practically possible
- All equipment utilizing hydrocarbons will be stored on a hard-standing surface.
- Little to no machinery and vehicle repairs onsite, this could lead to hydrocarbon spills.
- Regular maintenance of the mobile toilets.
- Immediate clearing of the cores to avoid possible leaching.
- Drilled areas will be rehabilitated immediately once done.
- Availability of waste management bins around the prospecting area, for metals and non-metal waste.
- Prohibition signs will be placed at various location around the prospecting area.

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A 	**B** 
C 	**D** 
E 	

Table 6: Mitigation Measures proposed for the prospecting phase

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7.3 Impact assessment and mitigation measures table

Prospecting right impact assessment Table						
Name of the company: Singo Consulting (pty) Ltd				**Sector: Environmental Consulting**		
Department: Land and water division						
CAUSE/ SOURCE OF THE IMPACT	**RECOMMENDED MEASURES/REMARKS FOR MITIGATION**	**IMPACT RISK BEFORE MITIGATION**	**IMPACT RISK AFTER MITIGATION**	**RESPONSIBLE PERSON(S)**	**WHEN MITIGATION WILL BE IMPLEMENTED**	**POTENTIAL IMPACT/ EFFECTS**
Oil, petrol, and diesel due to drill rigs, trucks, and cars.	➢ Diesel, petrol, and oil spill absorbent material available onsite. ➢ No machinery repairs onsite. ➢ Vehicle condition checklist available. ➢ No storage of diesel, oil, and petrol onsite.			➢ The project management team	Before and during the prospecting activities commence.	➢ Respiratory illness. ➢ Risk of cancer in humans. ➢ Reduce photosynthetic ability of plants.
Overflow of waste chamber and leakage of waste with toilet chemicals.	➢ Regular maintenance of the mobile toilets on site to avoid leakage and overflow.			➢ Toilets Hiring Company. ➢ Project management team	Throughout the prospecting phase, from when they start to when they finish.	➢ Biocides used are toxic can cause endocrine disrupting and reproductive effects if ingested.
Clearing of vegetation leading to increased runoff and less infiltration.	➢ Rehabilitate the site by using a hoe to dig the compacted soil, this will allow infiltration.			➢ The project management team	After pegging and drilling	➢ Destroying local ecosystem. ➢ Decrease the availability of water in an area, Groundwater, and surface water.

Vehicles wash wastewater (VWW)	➢ No washing of Machinery or vehicles on site			The project management team	During prospecting period	➢ Harm surface water aquatic ecosystem. ➢ Degrade the quality of surface and groundwater quality. ➢ Muscle cramping or nausea.
Soil compaction during constructing gravel roads to access the site.	➢ Rehabilitate these roads by digging with tractors and ploughing vegetation			The project management team	After the prospecting phase	➢ Destruction of ecosystem. ➢ Increase run-off, decrease groundwater recharge.
Core logging	➢ The core logs of borehole will be cleared immediately after logging.			The project management team	After the prospecting phase	➢ Leaching of core logs into nearby wetlands (Seep and Valley bottom) and compromise water quality.
Disposal of waste such as metals E.g., Iron, around the prospecting area	➢ There will be waste management bins all around the site, to ensure there are no metals on the ground, or any other waste.			The project Management team	Before the prospecting phase commences.	➢ Rust from metals causes tetanus which affects nervous system. ➢ Degrades the quality of groundwater and surface water.

Low impact	Medium impact	High impact	Very high impact

Table 7; Prospecting impacts and mitigation measures

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8 CONCLUSION AND RECOMMENDATIONS

8.1 Conclusion and Summary

Singo Consulting (Pty) Ltd was appointed by Ulibo Resources to conduct a basic hydrogeological study and compile a report for the proposed prospecting activity on Portion of Portion 1 of the farm Simdlangentsha 16956 HU and the farm Bongaspoort 16930 HU, under the magisterial district of Pongola, KwaZulu Natal. The primary concern is associated with hydrocarbon spillage, and reduction of infiltration due to clearing of vegetation in the prospecting area. The area falls on a minor aquifer, and the surrounding area mostly depends on surface water. The groundwater vulnerability according to the drastic model is classified as Moderate, which implies that the aquifer requires Medium level of protection from the surface activity. The outlined groundwater management measures which include the availability of absorbent spill kits, regularly maintained of the mobile ablutions, and availability of the waste management bins. There will be compliance of the GN704 regulations, National waters Act No. 36 of 1998, NEMA Act 107 of 1998.

8.2. Recommendations

- On site there will be regular maintenance of the mobile toilets.
- Once drilling, the team will rehabilitate the area and ensure the core is out of site.
- Drilling within 100 meters of water resources will be avoided
- The drilling machine used will be of minimum vibrations to avoid creating fissures in underlying rocks which could influence groundwater migration and leads to water contamination
- Clearing of vast amount of vegetation will be avoided, this is to preserve infiltration.
- Constant availability of waste bins; Compliance of National Environmental Management: Waste Management Act 59 of 2008.
- Compliance of GN 704 4(b) and 7(a) and National Water Act 36 of 1998 (Chapter 3 – Part 4, Section 1 (a)(b).
- No onsite vehicle or machinery repairs such as changing oil.
- No onsite storage of oil, diesel, or petrol.
- Cores will be logged on an impervious surface and will be cleared from the site immediately after logging.
- The area is mountainous, this increases run-off, wastewater from drilling will be channelled and collected.

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APPENDICES

Appendix A: Specialist's qualifications available upon request

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PROSPECTING RIGHT BASIC ECOLOGY STUDY

Basic Ecological Assessment Study for the proposed prospecting right application on a portion of portion 1 of the Farm Simdlangentsha 16956 HU and the Farm Bongaspoort 16930 HU, situated in the Magisterial District of Simdlangentsha in Kwazulu Natal Province, South Africa

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PREPARED FOR

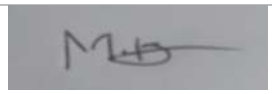
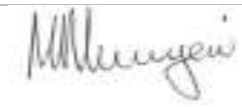
ULIBO RESOURCES (Pty) Ltd
Reg Nr: 2013/099506/07

2022

DMRE REF NO: KZN 30/5/1/1/2/11230 PR

Project details

Report type	Basic Ecological Assessment Study for prospecting right application
Project title	Basic Ecological Assessment Study for the proposed prospecting right application on a portion of portion 1 of the Farm Simdlangentsha 16956 HU and the Farm Bongaspoort 16930 HU, situated in the Magisterial District of Simdlangentsha in Kwazulu Natal Province, South Africa
Client	Ulibo Resources (Pty) Ltd
Site location	Farm Simdlangentsha 16956 HU and the Farm Bongaspoort 16930 HU, situated in the Magisterial District of Simdlangentsha in Kwazulu Natal Province, South Africa
Version	1
Date	12 July 2022

		Electronic signatures
Compiled by	Khodani Mathako (Environmental Assessment Practitioner) Singo Consulting (Pty) Ltd	
Reviewed by	Mutshidzi Munyai (Hydrogeologist) Singo Consulting (Pty) Ltd (Water Resources Science (Candidate Natural Scientist), Environment Science (Candidate Natural Scientist) (SACNASP Registration Number 122464)	
Final review and approval	Dr. Kenneth Singo (Principal Consultant of Singo Consulting (Pty) Ltd)	

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Project credentials

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Abbreviations

BGIS	Biodiversity Geographical Information System
CARA	Conservation of Agricultural Resources
CBA	Critical Biodiversity Area
CR	Critically Endangered
DEA	Department of Environmental Affairs
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
SC	Singo Consulting
EN	Endangered
ESA	Ecological support area
NEMA	National Environmental Management Act, 107 of 1998
NEMBA	National Environmental Management Biodiversity Act, 10 of 2004
ONA	Other Natural Area
PA	Protected area
SANBI	South African National Biodiversity Institute
SARCA	Southern African Reptile Conservation Assessment
SFSD	Strategic Framework for Sustainable Development
VU	Vulnerable

1 INTRODUCTION

Ulibo Resources (Pty) Ltd intends to prospect for cobalt, copper ore, Diamond (General), Diamond (Alluvial), Iron ore, Magnesite, Manganese ore, Nickel ore, Rare Earths, Tin ore, Zinc ore on a portion of portion 1 of the Farm Simdlangentsha 16956 HU and the Farm Bongaspoort 16930 HU, situated in the Magisterial District of Simdlangentsha in Kwazulu Natal Province, South Africa. Singo Consulting (Pty) Ltd (Singo Consulting) has been appointed as an independent Environmental Assessment Practitioner (EAP) to undertake an environmental impact assessment (EIA) for the proposed project in terms of EIA Regulations of the National Environmental Management Act, 1998 (Act No.107 of 1998) as amended, 7 April 2017 (NEMA).

The EIA process requires that specific ecology study be conducted. Singo Consulting has been appointed to conduct the ecology impact assessment for the proposed project. This assessment identifies the negative environmental impact that the proposed project might have on the fauna, flora, and the sensitive faunal habitat found on site, and recommends mitigation measures.

1.1 Terms of reference

The terms of reference for this investigation are limited to an ecological assessment that aims to:

- Determine the general ecological state of the proposed project area.
- Examine and demarcate environmentally sensitive and critical areas.
- Ascertain the potential impacts of the proposed project on the environment and its associated fauna and flora.
- Map the environmentally sensitive and critical areas with regards to the proposed project.
- Identify and document protected or Red Data Listed fauna or flora species on site.
- Provide mitigation measures to avoid or prevent environmental impacts.
- Compile ecological assessment report with findings, recommendations and maps of the sensitive areas or no-go areas.

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2 LEGISLATIVE REQUIREMENTS

This section summarises activities and their potential impacts on the project area. It should be noted that these acts specifically refer to ecological and wetland studies.

Table 1: Acts and regulations relating to the project.

Legislation/policy	Description
The Convention of Biological Diversity (Rio de Janeiro, 1992).	The purpose of the Convention on Biological Diversity is to conserve the variability among living organisms, at all levels (including diversity between species, within species and of ecosystems). Primary objectives include (i) conserving biological diversity, (ii) using biological diversity in a sustainable manner and (iii) sharing the benefits of biological diversity fairly and equitably.
South African Constitution 108 of 1996	The Constitution is the supreme law of the land and includes the Bill of Rights which is the cornerstone of democracy in South Africa and enshrines the rights of people in the country. It includes the right to an environment which is not harmful to human health or well-being and to have the environment protected for the benefit of present and future generations through reasonable legislative and other measures.
Strategic Framework for Sustainable Development in South Africa	The development of a broad framework for sustainable development was initiated to provide an overarching and guiding National Sustainable Development Strategy. The Draft Strategic Framework for Sustainable Development (SFSD) in South Africa (September 2006) is a goal orientated policy framework aimed at meeting the Millennium Development Goals. Biodiversity has been identified as one of the key crosscutting trends in the SFSD. The lack of sustainable practices in managing natural resources, climate change effects, loss of habitat and poor land management practices were raised as the main threats to biodiversity.
NEMA	This is a fundamentally important piece of legislation and effectively promotes sustainable development and entrenches

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Legislation/policy	Description
	principles such as the 'precautionary approach', 'polluter pays' principle, and requires responsibility for impacts to be taken throughout the life cycle of a project NEMA provides the legislative backing (Including Impact Assessment Regulations) for regulating development and ensuring that a risk-averse and cautious approach is taken when making decisions about activities.
EIA regulations	New regulations have been promulgated in terms of Chapter 5 of NEMA and were published on 7 April 2017 in Government Notice No. R. 326. Development and land use activities which require Environmental Authorisation in terms of the NEMA EIA Regulations, 2017, are in Listing Notice 3 (GG No. R.324, LN3) identified via geographic areas with the intention being that activities only require Environmental Authorisation when located within designated sensitive areas. These sensitive/geographic areas were identified and published for each of the nine (9) Provinces.
National Environmental Management: Biodiversity Act No 10 of 2004 (NEMBA)	The Biodiversity Act provides listing threatened or protected ecosystems, in one of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Protected (Government Gazette, 2011). The main purpose of listing threatened ecosystems is to reduce the rate of ecosystem and species extinction and includes the prevention of further degradation and loss of structure, function and composition of threatened ecosystems.
Conservation of Agricultural Resources Act 43 of 1967	The intention of this Act is to control the over-utilisation of South Africa's natural agricultural resources, and to promote the conservation of soil and water resources and natural vegetation. The CARA has categorised a large number of invasive plants together with associated obligations of the landowner, including the requirement to remove categorised invasive plants and taking measures to prevent further spread of alien plants.

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Legislation/policy	Description
National Forest Act 84 of 1998	The protection, sustainable management and use of forests and trees within South Africa are provided for under the National Forests Act (Act 84 of 1998).
National Environmental Management: Protected Areas Act 57 of 2003	This Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. It also seeks to provide for the sustainable utilization of protected areas and to promote participation of local communities in the management of protected areas.
The RAMSAR Convention	Emphasis is placed on protecting wetlands and implementing initiatives to maintain or improve the state of wetland resources.
Convention on Biological Diversity	Countries are to rehabilitate or restore degraded ecosystem through the formulation of appropriate strategies and plans.
United Nations Convention to Combat Desertification	South Africa has responded to the UN Convention to Combat Desertification by developing a National Action Plan. The aim of the NAP is to implement at current and future policies that affect natural resource management and rural development, and establish partnerships between government departments, overseas development agencies, the private sector and NGOs.

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3 LIMITATIONS

The following limitations apply to this report:

1. There is limited literature on the study area, making it difficult to compile a detailed report about the proposed site.
2. No floral species of concern observered onsite during site assessment.
3. Some areas of the proposed site are covered with flourishing natural vegetation, so it was not easy to identify walking trails, spoor, fur, faeces, burrow, bones, and dead bodies of species which might be present onsite.
4. Singo Consulting reserves the right to amend this report, recommendations and/or conclusions at any stage should any additional or otherwise significant information come to light.

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4 PROJECT DESCRIPTION AND LOCATION

4.1 Project location

The proposed prospecting right area is located on a portion of portion 1 of the Farm Simdlangentsha 16956 HU and Farm Bongaspoort 16930 HU, situated in the Magisterial District of Simdlangentsha in Kwazulu Natal Province, South Africa (see Figure 1 and Figure 2). The site covers an extent of 3410.61 ha and is situated approximately 14.77 km Northwest of Ithala Game Reserve, 9.84 km Southwest of African Gospel Church and approximately 29 km Northwest of Pakamisa Lodge. The proposed site can be accessed via gravel road.

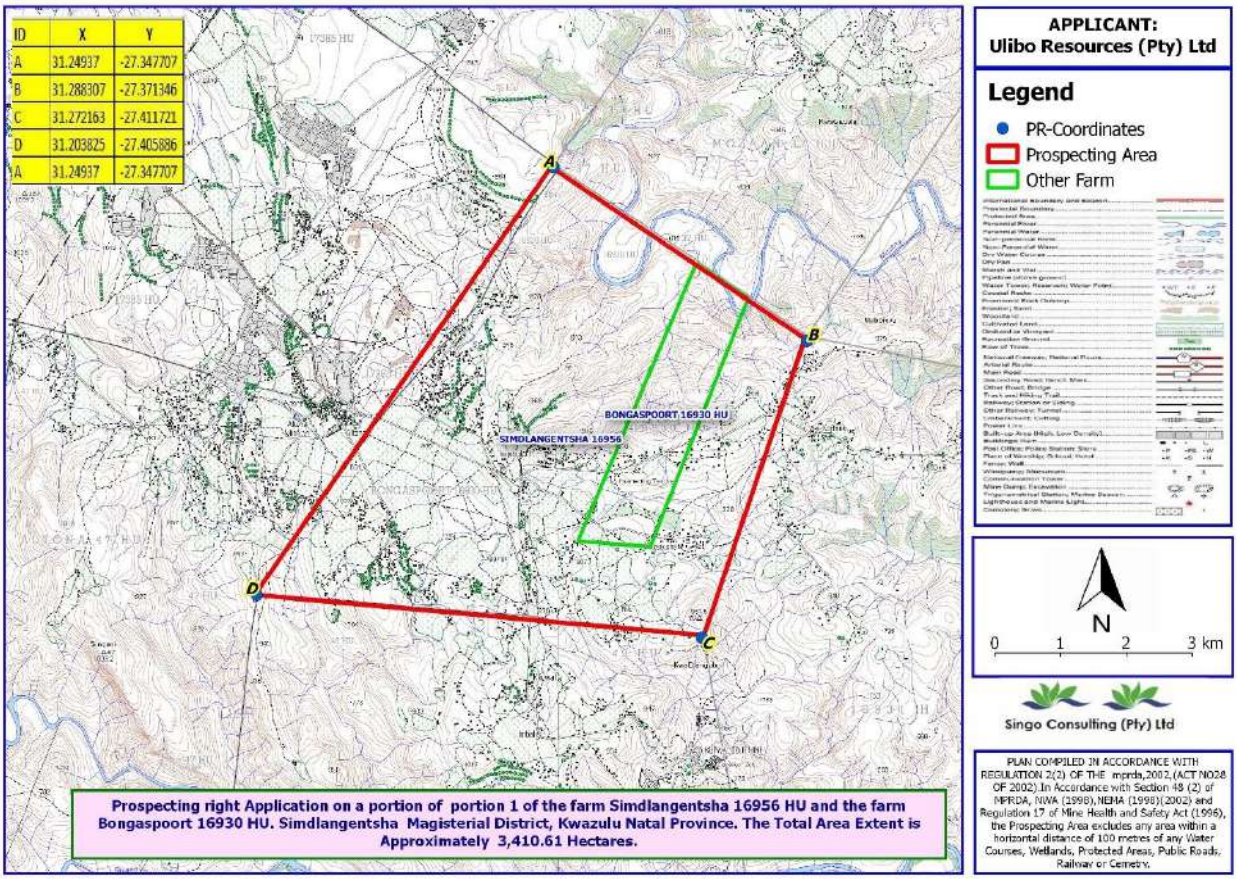

Figure 1: Regulation Map 2.2 for the proposed site.

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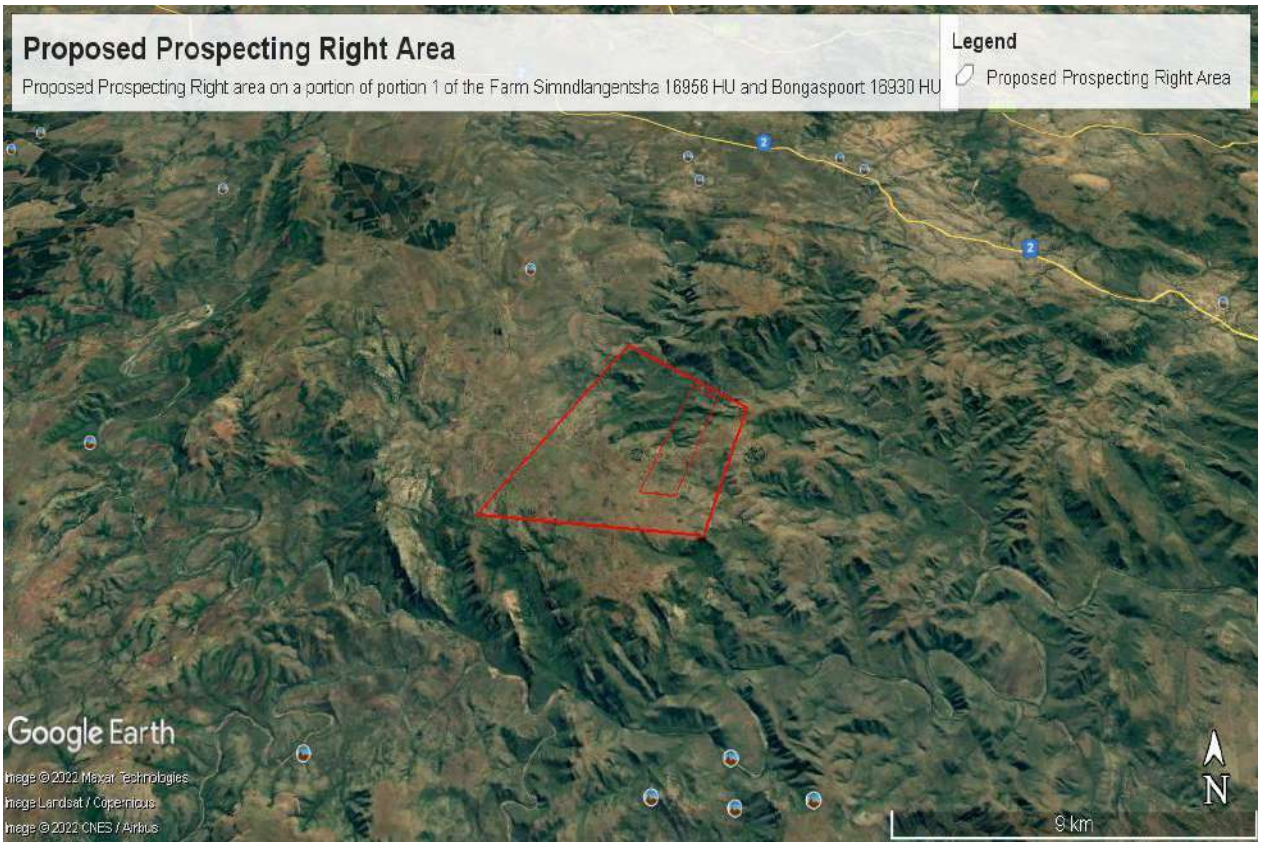

Figure 2: Google Earth view.

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5 GENERAL DESCRIPTION OF THE RECEIVING ENVIRONMENT

5.1 Climatic conditions

The regional climate of the proposed area is characterised by frost infrequent to occasional at higher altitudes and summer rainfall with dry winters. The proposed area receives approximately 700–1350 mm of rainfall. Figure 3 shows the mean annual temperature of the proposed area. The area receives a lot of rainfall during summer season and some areas receives about 601-800mm whereas other areas receive 801-1000mm of mean annual rainfall (see Figure 4).

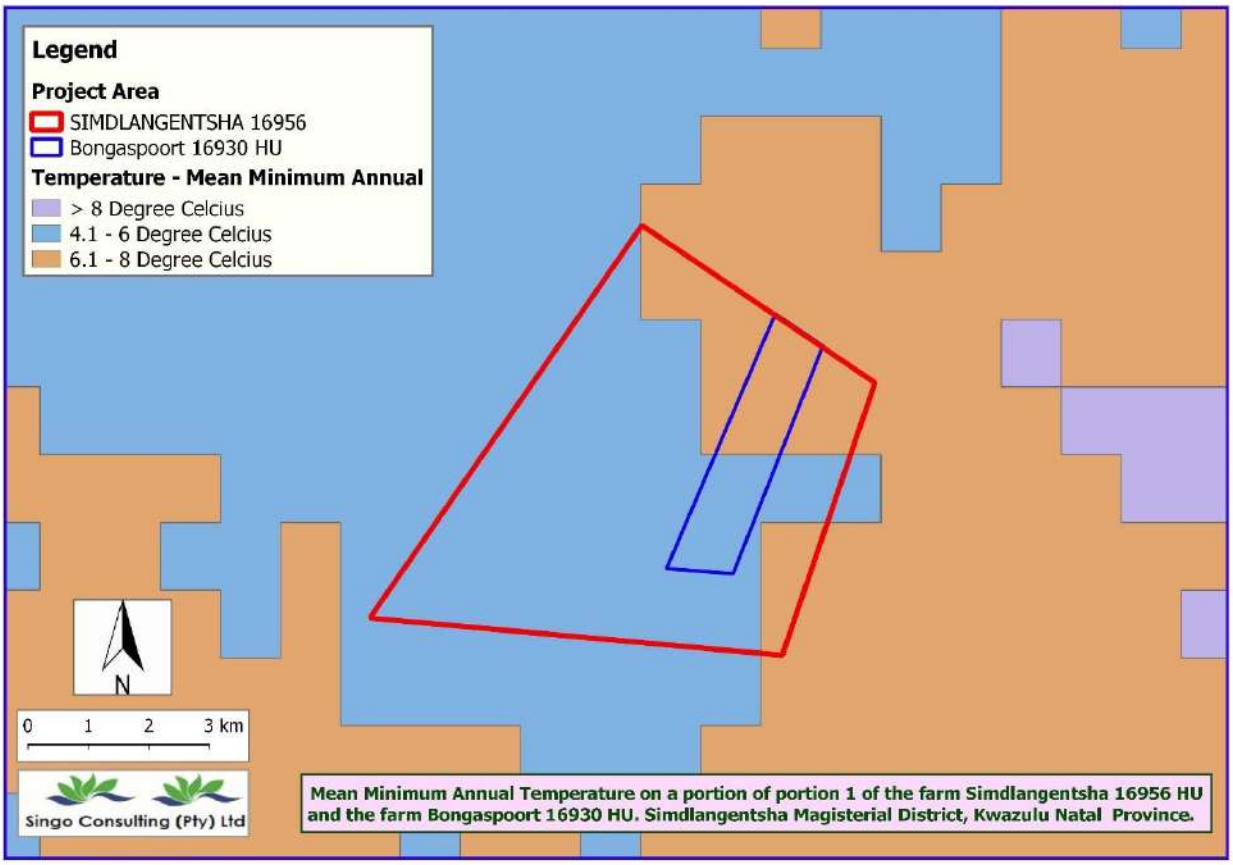

Figure 3: Mean annual temperature for the site.

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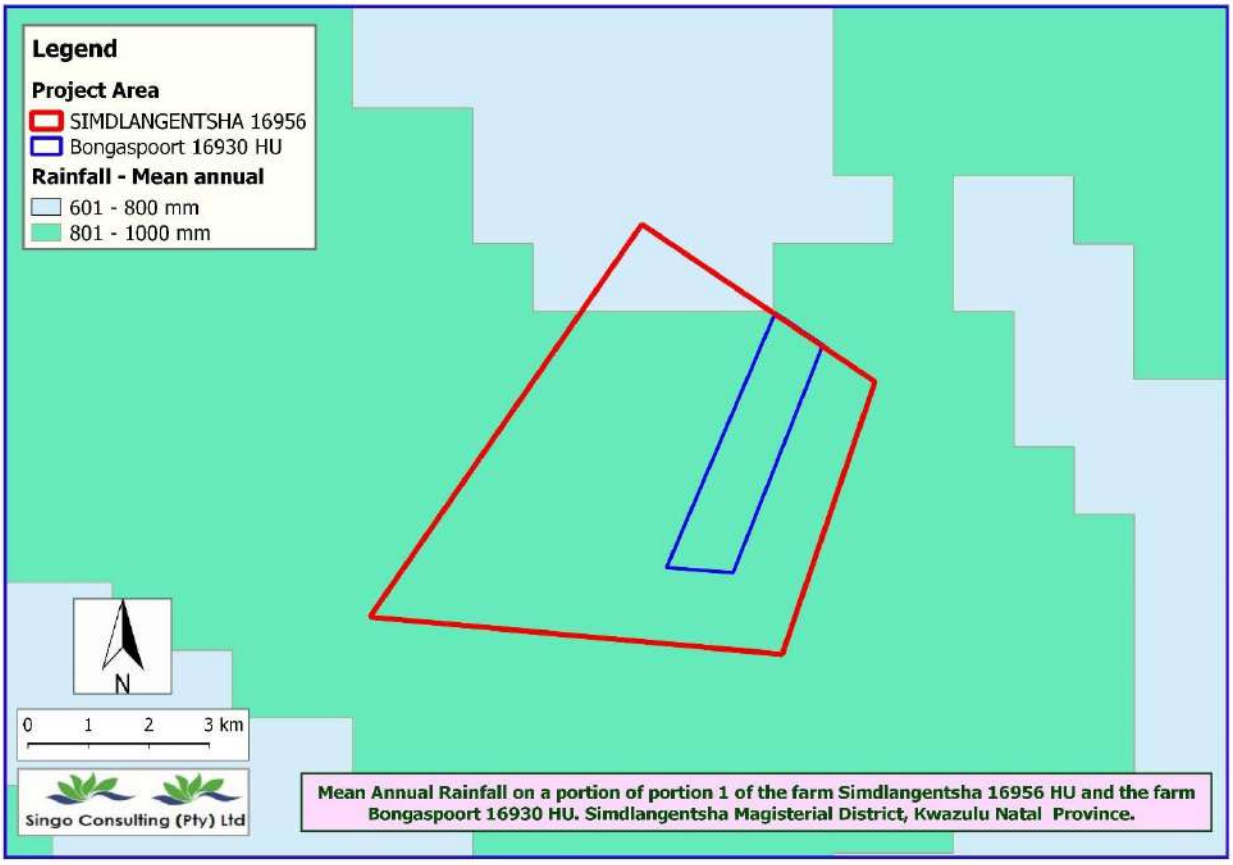

Figure 4: Mean annual rainfall for the site.

5.2 Land use and land cover

The proposed project site is dominated by natural vegetation. The land use and land cover of the proposed area includes plantation, natural vegetation, degraded, waterbodies, mines, built-up areas, uncategorized, and cultivated land (see Figure 5). During site assessment some of the areas of the proposed site were covered with plantation, waterbodies, and natural vegetation.

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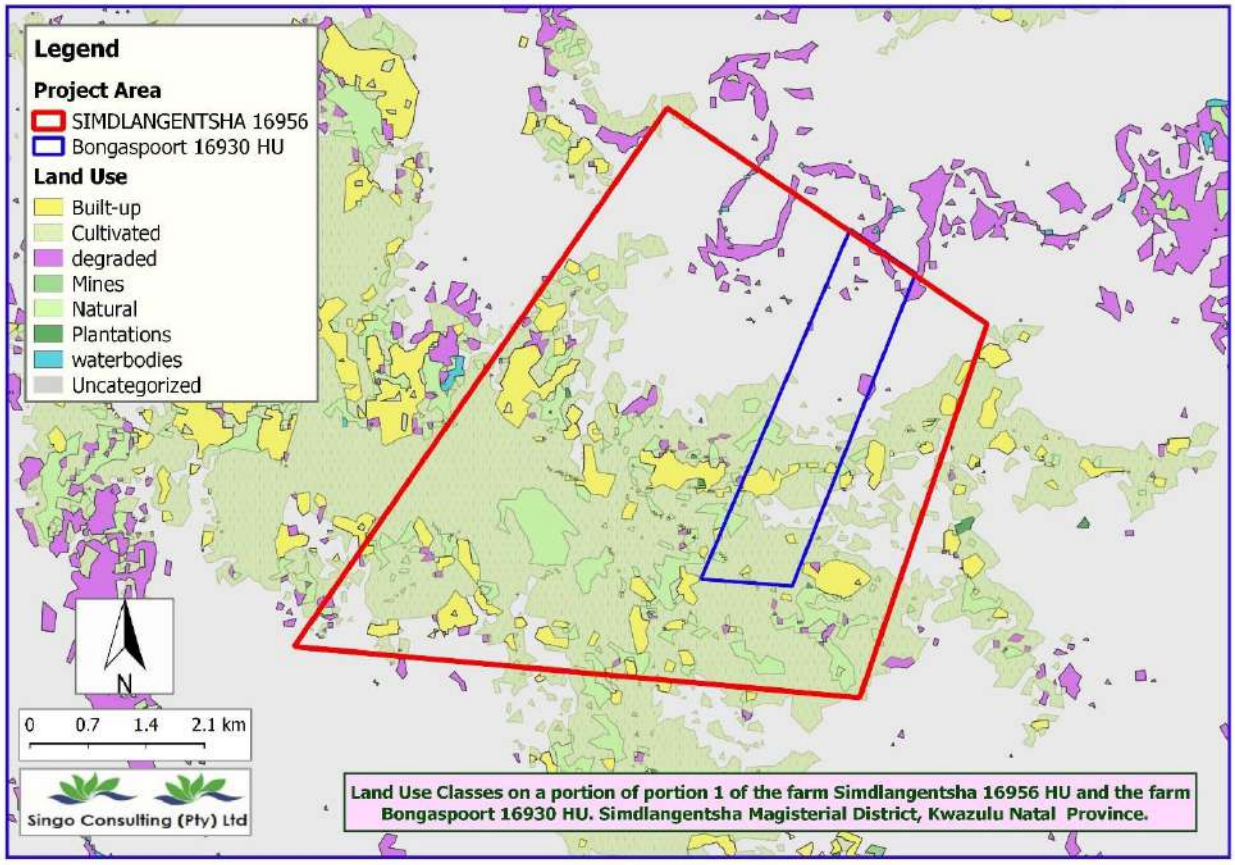

Figure 5: Proposed project site land use.

5.3 Overview of the Biome type

Biomes are broad ecological units that represent major life zones extending over large natural areas. Biomes are further divided into bioregions, which are spatial terrestrial units possessing similar biotic and physical features, and processes at a regional scale (Rutherford, 1997). The large area of the proposed project site falls in the grassland biome and small area falls in the forest biome (see Figure 6). Forest biomes are characterised by a closed canopy and several vegetation strata, usually a canopy of tall trees, a mid-stratum of small trees and shrubs, and a ground layer of herbaceous plants and ferns with grasses usually absent. Grassland biome is the ecological unit dominated by grasses, however small herbaceous plants (forbs and geophytes) are surprisingly abundant in most grasslands. Trees are generally few, although shrubs occur in sheltered areas (Schmidt et al., 2002).

Grassland biome is the second largest biome in South Africa covering 29% and it occurs in 8 provinces including Gauteng, Limpopo, Eastern Cape, Mpumalanga, KwaZulu-Natal,

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Free State, Northwest, and the Northern Cape. In South Africa, grasslands have high species richness and high turnover of biodiversity across the landscape. The grasslands are a very old, complex, and slowly evolved system with indigenous species diversity second only to the well-known fynbos biome. They play a crucial role in water production (Berruti, S.M., 2017).

The grassland biome in South Africa is not significantly different from the world-wide trend. It has approximately 3378 plant species occurring in the core region (Bredenkamp et al. 2006). Grassland biome covers about 28% of South Africa and is the dominant biome on the central plateau and inland areas of the eastern subcontinent (Manning, 2009). In Mpumalanga province, it occupies 76 495 km2 in the North-East of South Africa, it has been substantially reduced as 44% has been transformed, mainly through agriculture, plantations, and mining (Ferrar & Lötter 2007). The conservation of the biome is further complicated by the fact that many areas considered as natural area in fact abandoned croplands. It is highly fragmented, with only 4% of the remaining natural areas bigger than 100 km2 (Neke & Du Plessis 2004).

In South Africa, grassland biome is defined based on the vegetation structure in combination with environmental factors like the amount of summer rainfall and minimum temperatures in winter (Rutherford & Westfall 1986). It occurs mainly on the high central plateau (Highveld), the inland areas of the eastern seaboard, the mountainous areas of KwaZulu-Natal and the central parts of the Eastern Cape. The topography is mainly flat to rolling, but also includes mountainous regions and the Escarpment. The elevation associated with grassland regions is from about 300–400 m (Gs 2 Ithala Quartzite Sourveld and Gs 9 Midlands Mistbelt Grassland, respectively) to Thabana Ntlenyana (3 482 m)—the highest mountain in southern Africa (Mucina, L., 2006).

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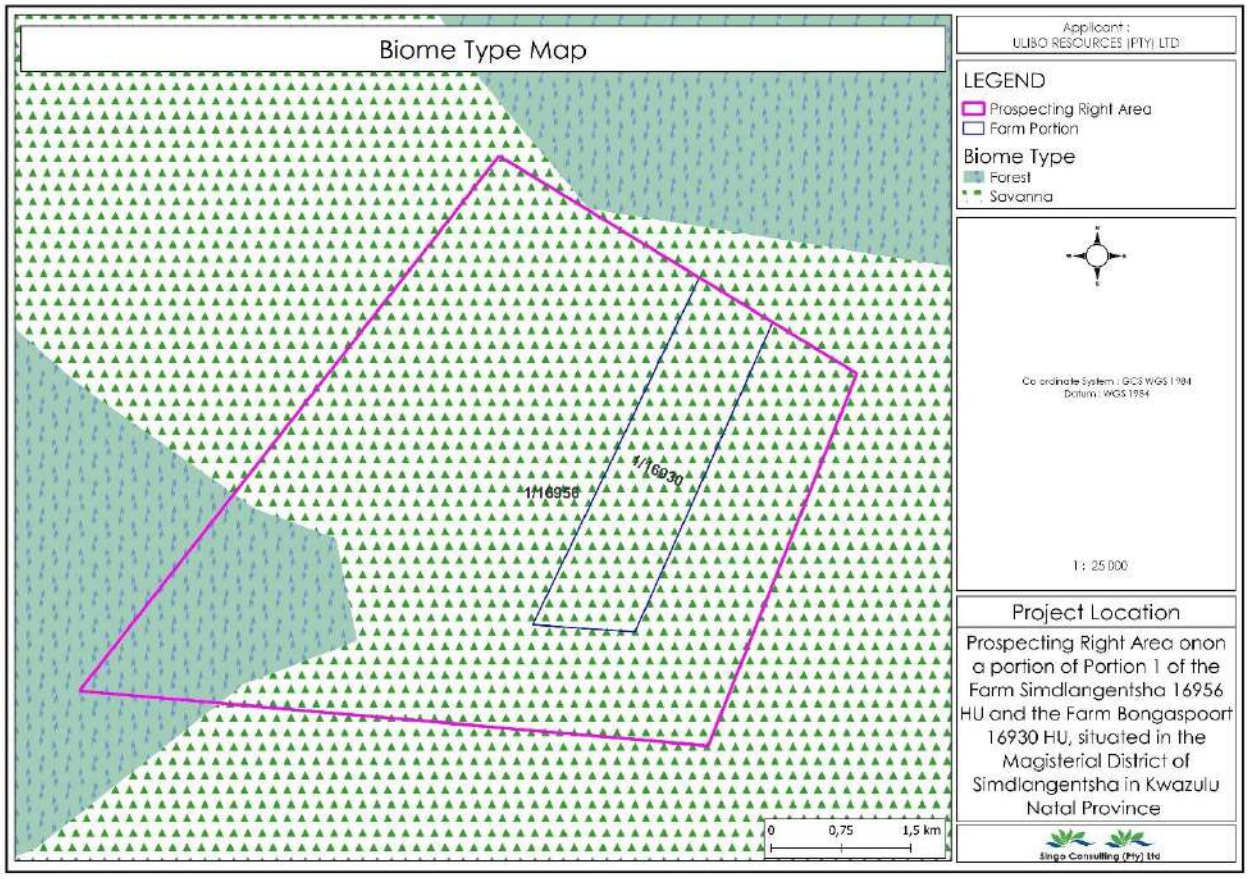

Figure 6: Biome type

5.4 Vegetation type of the proposed site

The large area of the proposed prospecting right area falls in the Northeastern Mountain Grassland and small area of the proposed site falls in the Natal Lowveld Bushveld (see Figure 7).

5.4.1 Vegetation map and conservation status

According to the vegetation map, the proposed area falls in the SVI 14 Swaziland Sour Bushveld. Approximately 57% of the proposed site falls in the VT 9 Lowveld Sour Bushveld (Acocks 1953) and approximately (73%) of the proposed site falls in the North-eastern Mountain Grassland (Low & Rebelo 1996).

Distribution: Mpumalanga Province, Swaziland and marginally into KwaZulu-Natal: From Badplaas, Tjakastad east to Piggs Peak area in the north, southwards through valleys around Manzini and slopes around the Grand Valley, and some isolated mountain

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outcrops in the lowveld plains, for example the Nkambeni Hills and Bulungu Mountains. Altitude 400–1 100 m.

Vegetation & Landscape Features: Open to closed, medium to tall tree layer with closed well-developed grass layer. Very hilly with moderate to steep slopes, positioned at higher altitudes than the adjacent SVI 3 Granite Lowveld to the east.

Geology & Soils: Grey soils derived mostly from Randian granites (Mpuluzi and Mswati) and Swazian granites and gneisses (Usutu Suite and Ngwane gneiss). The area reaches to the Onverwacht Group of the Barberton Greenstone Belt in the far north. Soils are dark, very clayey, of the Sterkspruit, Valsrivier, Swartland soil forms. Land types were unclassified in Swaziland, but elsewhere they are mainly Fa, Fb and Ae.

Important Taxa Tall Tree: *Philenoptera violacea. Small Trees: Acacia davyi (d), A. natalitia (d), A. sieberiana var. woodii (d), A. tortilis subsp. heteracantha (d), A. gerrardii, Combretum molle, C. zeyheri, Englerophytum magalismontanum, Faurea rochet¬iana, F. saligna, Pavetta edentula, Vangueria madagascariensis, Vitex obovata subsp. obovata, Ziziphus mucronata. Succulent Tree: Aloe marlothii subsp. marlothii. Tall Shrubs: Dichrostachys cinerea (d), Calpurnia glabrata, Cliffortia strobilifera, Crotalaria monteiroi, Elaeodendron transvaalense, Heteromorpha arbor¬escens var. abyssinica, Rhus pallens, R. pentheri, Tricalysia lanceolata. Low Shrubs: Barleria obtusa, Crossandra fruticulosa, Gnidia splendens, Gymnosporia heterophylla, Jatropha latifolia var. angustata, J. latifolia var. swazica, Justicia flava, Passerina filiformis, Rhus grandidens. Woody Climbers: Helinus integrifolius, Putterlickia verrucosa. Graminoids: Panicum maximum (d), Themeda triandra (d), Enteropogon monostachyus, Sporobolus fimbriatus, S. nitens. Herbs: Becium obovatum, Gerbera viridifolia, Helichrysum miconiifolium, Hemizygia pretoriae subsp. pretoriae, Nidorella auriculata. Geophytic Herbs: Eulophia petersii, Hypoxis rigidula.*

Biogeographically Important Taxa: (KZNNorthern KwaZulu-Natal endemic, NNorthern Sourveld endemic) Low Shrub: Hemizygia gerrardiiKZN. Geophytic Herb: Haemanthus pauculifoliusN.

Endemic Taxa: Geophytic Herbs: Drimiopsis pusilla, D. reilleyana.

Conservation Vulnerable: Target 19%. About 6% statutorily conserved in mainly the Songimvelo, Ithala and Malalotja Nature Reserves, and a further 0.5% conserved in the

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Mlilwane Game Sanctuary in Swaziland. Some 21% has been transformed by cultivation and plantations.

Remark: In this savanna vegetation unit with the highest MAP, Philenoptera violacea is not as restricted to water courses in contrast to its generally close association with water course areas in the drier vegetation units of the Lowveld and Mopane Bioregions.

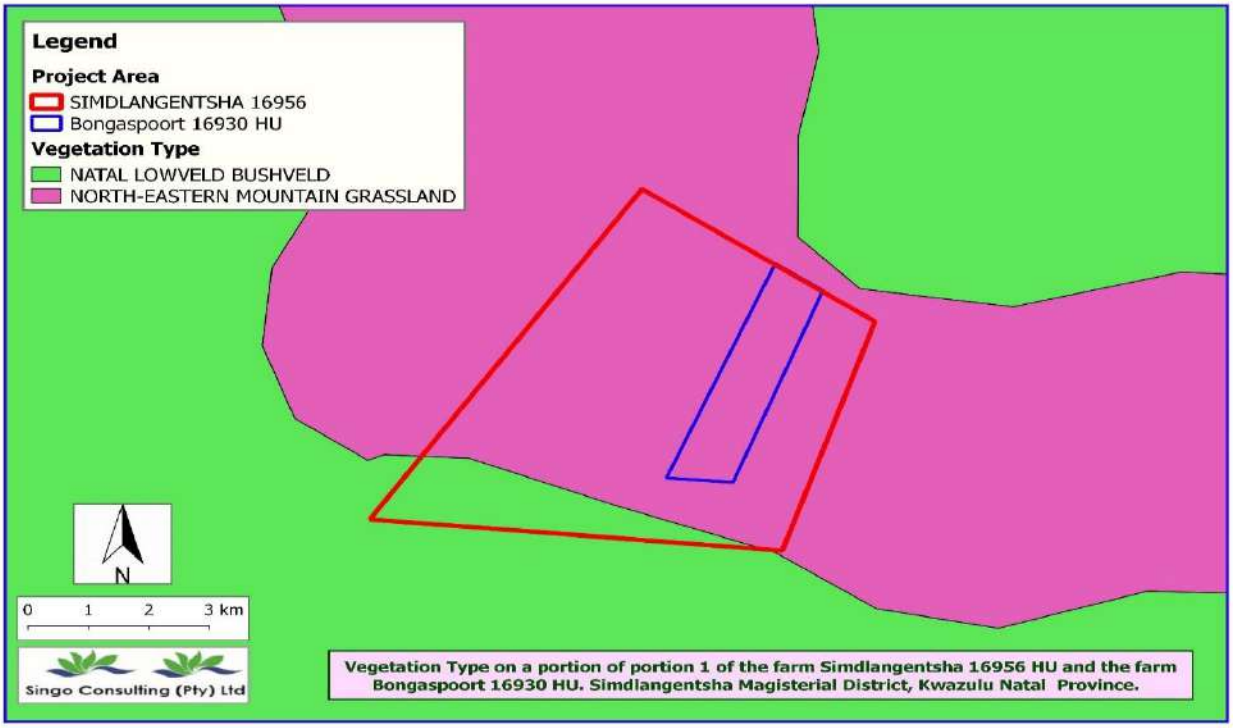

Figure 7: Vegetation type of the site.

5.5 Terrestrial threatened ecosystem

The South African National Biodiversity Institute (SANBI), in conjunction with the Department of Environmental Affairs (DEA), released a draft report in 2009 entitled "Threatened Ecosystems in South Africa: Descriptions and Maps", to provide background information on the List of Threatened Ecosystems (SANBI, 2009). The purpose of this report was to present a detailed description of each of South Africa's ecosystems and to determine their status using a credible and practical set of criteria. The following criteria were used in determining the status of threatened ecosystems:

1. Irreversible loss of natural habitat
2. Ecosystem degradation and loss of integrity

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3. Limited extent and imminent threat
4. Threatened plant species associations
5. Threatened animal species associations
6. Priority areas for meeting explicit biodiversity targets as defined in a systematic conservation plan

In terms of section 52 (1) (a), of the NEMBA, a new national list of ecosystems that are threatened and in need of protection was gazetted on 9 December 2012 (Government Notice 1002 (Driver et. al., 2004). The list classifies all threatened or protected ecosystems in South Africa in terms of four categories, namely CR, EN, VU, or protected. The purpose of categorising these ecosystems is to prioritise conservation areas to reduce the rates of ecosystem and species extinction, as well as preventing further degradation and loss of structure, function, and composition of these ecosystems. It is estimated that threatened ecosystems make up 9.5% of South Africa, with CR and EN ecosystems accounting for 2.7%, and VU ecosystems 6.8% of the land area. It is therefore vital that Threatened Terrestrial Ecosystems inform proactive and reactive conservation and planning tools, such as Biodiversity Sector Plans, municipal Strategic Environmental Assessments (SEAs) and Environmental Management Frameworks (EMFs), EIAs and other environmental applications (Mucina et al., 2006).

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6 METHODOLOGY AND SITE ASSESSMENT

The information provided in this terrestrial biodiversity report is based mainly on the observations that were made during the field survey and a review of the available reports that contain known and predicted biodiversity and wetland information on the study area. A wide range of spatial data sets were interrogated, and relevant information was extracted for the study area. A basic ecological sensitivity analysis was performed to identify areas of special interest or concern. The various approaches used, and aspects considered are detailed in this section.

6.1 Desktop study

A desktop survey was conducted, during which maps, and other aerial images, reports, and photography were reviewed to assemble background information on the different features of and vegetation present in the proposed project are. The site was assessed between 05 July 2022 and 08 June 2022 to record the present features and species.

6.2 Vegetation

A desktop study of the habitats of the red and orange-listed species was conducted prior to site assessment. The vegetation types identified by Mucina and Rutherford (2012) were used as reference, but where necessary vegetation communities were named according to the recommendations for a standardised South African syntaxonomic nomenclature system (Brown., et al, 2013). By combining the available literature, stratification of vegetation communities was possible.

6.3 Fauna survey

Most mammals and reptiles are very secretive, nocturnal, hibernate (reptiles), migrate (birds) or prefer specific habitats, so sampling and identification proved difficult.

6.4 Mammals

Mammals are nocturnal, secretive, or seasonal. Their specific habitats, walking trails, faeces, spoor, fur, bones, and carcasses were assessed to document mammal species that are associated with the proposed site. The site assessment was conducted using

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direct and indirect methods, including mammal sightings, identification of burrows and holes, and verification using literature (Skinner and Chimimba, 2005).

6.5 Ecological and faunal sensitivity analysis

Following the site visit, an ecological sensitivity analysis of the site was conducted based on the Mpumalanga Biodiversity Sector Plan (MBSP) which shows Critical Biodiversity Areas (CBAs) and Ecological Support Areas. The ecological sensitivity of the different units identified in the sensitive analysis procedure was rated according to the following scales:

1. **Low:** Units with a low sensitivity where there is likely to be a negligible impact on ecological processes and terrestrial biodiversity. This category is reserved specifically for areas where the natural vegetation has already been transformed, usually for intensive agricultural purposes like cropping. Most types of development can proceed within these areas with little ecological impact.
2. **Medium:** Areas of natural or previously transformed land where the impacts are likely to be largely local and the risk of secondary impact like erosion low. Development in these areas can proceed with relatively little ecological impact provided that appropriate mitigation measures are taken.
3. **High:** Areas of natural or transformed land where a high impact is anticipated due to the high biodiversity value, sensitivity, or important ecological role of the area. Development in these areas is highly undesirable and should only proceed with caution as it may not be possible to mitigate all impacts appropriately.
4. **Very high:** Critical and unique habitats that serve as habitat for rare/endangered species or perform critical ecological roles. These areas are essentially no-go areas from a developmental perspective and should be avoided at all costs.

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6.6 Methodology adapted in assessing impacts

Impact significance will be assessed using the following descriptors:

Table 2: Impact assessment table.

Nature of the impact		
Positive	+	Impact will be beneficial to the environment (a benefit).
Negative	-	Impact will not be beneficial to the environment (a cost).
Neutral	0	Where a negative impact is offset by a positive impact, or mitigation measures, to have no overall effect.
Magnitude		
Minor	2	Negligible effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been altered significantly and have little to no conservation importance (negligible sensitivity*).
Low	4	Minimal effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been largely modified, and / or have a low conservation importance (low sensitivity*).
Moderate	6	Notable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been moderately modified and have a medium conservation importance (medium sensitivity*).
High	8	Considerable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been slightly modified and have a high conservation importance (high sensitivity*).
Very high	10	Severe effects on biophysical or social functions / processes. Includes areas / environmental aspects which have not previously been impacted upon and are pristine, thus of very high conservation importance (very high sensitivity*).

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Extent		
Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3-5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
Duration		
Immediate	1	Effect occurs periodically throughout the life of the activity.
Short term	2	Effect lasts for a period 0 to 5 years.
Medium term	3	Effect continues for a period between 5 and 15 years.
Long term	4	Effect will cease after the operational life of the activity either because of natural process or by human intervention.
Permanent	5	Where mitigation either by natural process or human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability of occurrence		
Improbable	1	Less than 30% chance of occurrence.
Low	2	Between 30 and 50% chance of occurrence.
Medium	3	Between 50 and 70% chance of occurrence.
High	4	Greater than 70% chance of occurrence.
Definite	5	Will occur, or where applicable has occurred, regardless or despite any mitigation measures.

Once the impact criteria have been ranked for each impact, the significance of the impacts will be calculated using the following formula:

Significance Points (SP) = (Magnitude + Duration + Extent) x Probability

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The significance of the ecological impact is therefore calculated by multiplying the severity rating with the probability rating. The maximum value that can be reached through this impact evaluation process is 100 SP (points). The significance for each impact is rated as High (SP≥60), Medium (SP = 31-60) and Low (SP<30) significance as shown in the Table 3.

Table 3: Definition of significance rating.

Significance of predicted NEGATIVE impacts		
Low	0-30	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation and as such have a limited influence on the decision
Medium	31-60	Where the impact can have an influence on the environment and should be mitigated and as such could have an influence on the decision unless it is mitigated.
High	61-100	Where the impact will have an influence on the environment and must be mitigated, where possible. This impact will influence the decision regardless of any possible mitigation.
Significance of predicted POSITIVE impacts		
Low	0-30	Where the impact will have a relatively small positive effect on the environment.
Medium	31-60	Where the positive impact will counteract an existing negative impact and result in an overall neutral effect on the environment.
High	61-100	Where the positive impact will improve the environment relative to baseline conditions.

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7 ASSESSMENT RESULTS

7.1 Plant species of conservation concern

Species of conservation concern (SCC) are either categorized as Red Data Listed species (RDL species), according to specific scientifically researched criteria and administered by the South African National Biodiversity Institute (SANBI), as protected trees by the National Forests Act (NFA)(Act No. 84 of 1998), or as Protected Trees and Plants by The NEMBA Threatened or Protected Species Regulations 152 of 2007 ("TOPS Regulations") and the Lists of Critically Endangered, Vulnerable and Protected Species (TOPS Lists).

During desktop study, the screening report shows that the proposed project area is of low to medium sensitivity with the following floral species: *Protea comptonii, Melanospermum italae, Dierama erectum, Thorncroftia longiflora, Lotononis amajubica, Leucospermum gerrardii, Gerbera aurantiaca.* During ground truthing, medium sensitivity plants species of conservation concern were not observed onsite. According to the list of protected species under Schedule 11; no person may cut, disturb, damage, or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate, or in any other manner acquire or dispose of any protected plant unless he or she is the holder of a permit which authorises him or her to do so. The species of conservation concern should not be disturbed during prospecting if they are identified onsite.

7.2 Vegetation

During site assessment, it was observed that some areas of the proposed site are covered with natural vegetation and some of the areas are modified due to residential activities. Figure 8 below depicts some of the floral species observed onsite namely, **(A)** *Cymbopogon excavatus* **(B)** *Bauhinia galpinii N.E.Br* **(C)** *Calotropis procera (Aiton) R.Br. and* **(D)** *Cussonia spicata Thunb*. The floral species identified in this community include: *Themeda triandra, Melinis repens, Cynodon dactylon (L) pers, Pteridium aquilinum (L.) Kuhn, Diospyros lycioides Desf. subsp. Lycioides, Senna occidentalis (L.) Link, Cymbopogon excavates, Hyparrhenia hirta (L.) Stapf, Tagetes minuta L, Sporobolus pyramidalis P.Beauv, Sporobolus Africanus, Lippia javanica (Burm.f.) Spreng, Cussonia spicata Thunb, Bauhinia galpinii N.E.Br, Calotropis procera (Aiton) R.Br, Ricinus communis L, Gomphocarpus physocarpus E.Mey, Phoenix reclinate Jacq, Vachellia gerrardii*

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(Benth.) P.J.H.Hurter subsp. gerrardii and Psidium guajava L. Table 5 depicts plant species identified onsite.

Sensitivity aspects:

1. The area has an ecological functioning and conservation importance of high as it is a grazing area for wild animals and livestock.
2. The suitability of this community for red data/protected species is considered low and no red data species were recorded during site assessment.

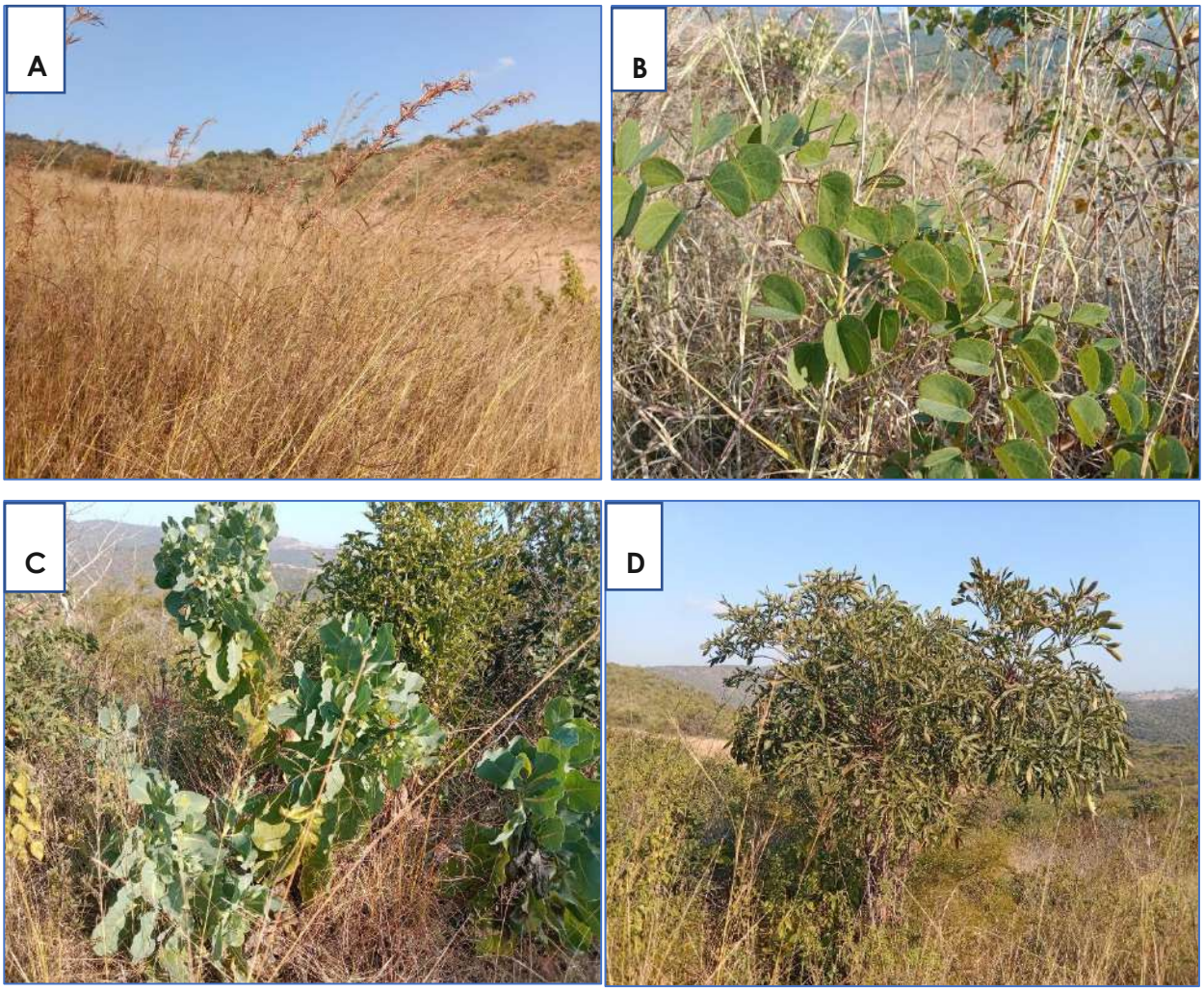

Figure 8: Some of the floral species observed onsite.

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Table 4: Floral species identified onsite.

Scientific name	Common name	Threat Status (SANBI, 2017)	SA Endemism
Themeda triandra	Red grass	LC	Not Endemic
Melinis repens	Natal Red Top	LC	Not Endemic
Cynodon dactylon (L) pers	Bermuda Grass	LC	Not Endemic
Pteridium aquilinum (L.) Kuhn	Northern bracken fern	LC	Not endemic
Diospyros lycioides Desf. subsp. lycioides	Bluebush	LC	Not endemic
Senna occidentalis (L.) Link	Coffee senna	Not Evaluated	Naturalized exotics
Cymbopogon excavatus	common turpentine grass	LC	Not Endemic
Hyparrhenia hirta (L.) Stapf	Blue Grass	LC	Not Endemic
Tagetes minuta L	Aztec marigold	Not Evaluated	Naturalized Exotics
Aloe lateritia Engl	Flowering plant	LC	
Sporobolus pyramidalis P.Beauv.	Cat's Tail Grass	LC	Not endemic
Sporobolus Africanus	Ratstailgrass	LC	Not Endemic
Phoenix reclinate Jacq	Senegal date palm	LC	Not endemic
Lippia javanica (Burm.f.) Spreng.	Beukesbos	LC	Not Endemic
Cussonia spicata Thunb.	Cabbage Tree	LC	Not Endemic
Bauhinia galpinii N.E.Br	African plume	LC	Not Endemic
Calotropis procera (Aiton) R.Br.	Broadleaf evergreen	Not Evaluated	Naturalized Exotics
Ricinus communis L	Castor communis L	Not Evaluated	Naturalized Exotics
Vachellia gerrardii (Benth.) P.J.H.Hurter subsp. gerrardii	Acacia gerrardii Benth	LC	Not Endemic
Gomphocarpus physocarpus E.Mey	Milkweed	LC	Not Endemic
Psidium guajava L	Guave	Not Evaluated	Naturalized exotics

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7.3 Alien invasive plants

Declared weeds and invaders have the tendency to dominate or replace the herbaceous layer of natural ecosystems, thereby transforming the structure, composition, and function of natural ecosystems. It is important that all these transformers be eradicated and controlled by means of an eradication and monitoring programme. Some invader plants may degrade ecosystems through superior competitive capabilities to exclude native plant species (Henderson, 2001).

The NEM:BA is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of alien invasive species was published in terms of the NEM:BA. The Alien and Invasive Species Regulations were published in the Government Gazette No. 43726 on 18 September 2020. The legislation calls for the removal and/or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 m of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam, or wetland. Category 3 plants are also prohibited from occurring close to a watercourse. The following describes the three categories in terms of the NEM:BA:

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy, or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the restricted activities (import, possess, grow, breed, move, sell, buy, or accept as a gift) involving Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

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According to the regulations, a person who has under their control a Category 1b listed invasive species must immediately:

- Notify the competent authority in writing
- Take steps to manage the listed invasive species in compliance with:
  - Section 75 of the Act
  - The relevant invasive species management programme developed in terms of regulation 4
  - Any directive issued in terms of section 73(3) of the Act

During ground truthing, two species categorised as Category 1b and one species NEMBA Category 2 were recorded. Several other exotic plants not listed under NEMBA were also recoded. Table 6 lists exotic floral species identified during ground truthing. Figure 9 depicts invader species listed under NEMBA categories observed onsite, namely **(A)** *Eucalyptus camaldulensis* **(B)** *Lantana camara L*.

Table 5: Alien and invader species recorded in the study area.

Common names	Scientific names	Threat Status (SANBI, 2017)	SA Endemism	Alien Category
Black wattle	*Acacia mearnsii*	NE	Naturalized Exotics	NEMBA Category 2
Blackjack	*Bidens Pilosa*	NE	Not Indigenous	Naturalized exotic weed
Boesmandruiwe	*Lantana camara L*	Not Evaluated	Naturalized exotics	NEMBA Category 1b
Red River Gum	*Eucalyptus camaldulensis*	NE	Not Indigenous	NEMBA Category 1b

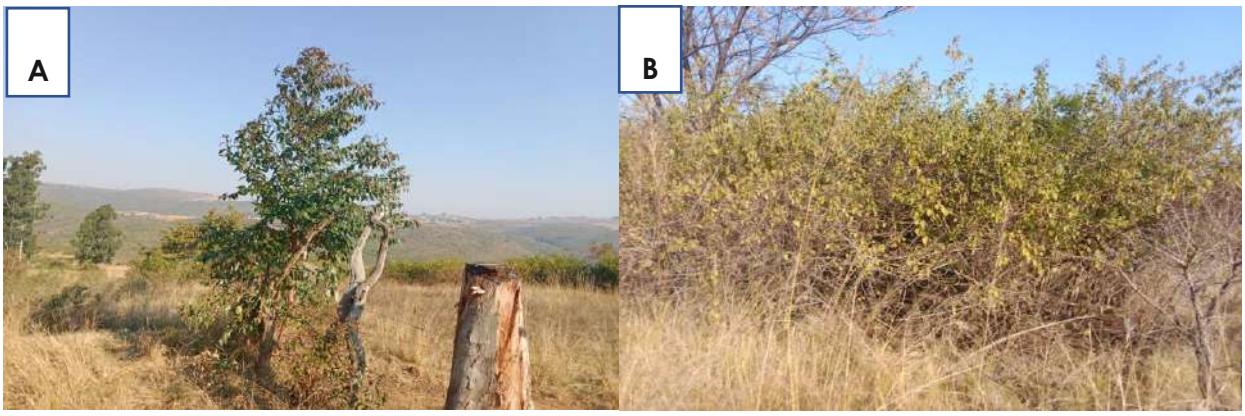

Figure 9: Invader plant species recorded onsite.

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7.4 Description of Critical Biodiversity Areas

Critical Biodiversity Areas (CBAs) are terrestrial and aquatic features in the landscape that are critical in retaining biodiversity and supporting continued ecosystem functioning and services (SANBI, 2007). These form the key output of a systematic conservation assessment and are the biodiversity sector inputs into multi-sectoral planning and decision-making tools.

The primary purpose of CBAs is to inform land-use planning and land-use guidelines attached to its aim to promote sustainable development by avoiding loss or degradation of important natural habitat and landscapes in these areas. CBAs can be used to inform protected area expansion and development plans. The use of CBAs here follows the definitions laid out in the guideline for publishing bioregional plans (Anon, 2008):

1. "Critical biodiversity areas (CBAs) are areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses".

2. "Ecological support areas (ESA's) are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree of restriction on land use and resource use in these areas may be lower than that recommended for critical biodiversity areas."

The guideline for bioregional plans defines three basic CBA categories based on three high-level land management objectives.

Table 6: A framework for linking spatial planning categories (CBAs) to land-use planning and decision-making guidelines based on a set of high-level land biodiversity management objectives.

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CBA category	Land management objective
PA & CBA 1	Natural landscapes: 1. Ecosystems and species fully intact and undisturbed. 2. Areas with high irreplaceability or low flexibility in terms of meeting biodiversity pattern targets. If the biodiversity features targeted in these areas are lost, targets will not be met. 3. Landscapes that are at or past their limits of acceptable change.
CBA 2	Near-natural landscapes: 1. Ecosystems and species largely intact and undisturbed. 2. Areas with intermediate irreplaceability or some flexibility in terms of area required to meet biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising target achievement. 3. Landscapes that are approaching but have not passed their limits of acceptable change.
Ecological Support Areas (ESA)	Functional landscapes: 1. Ecosystems moderately to significantly disturbed but still able to maintain basic functionality. 2. Individual species or other biodiversity indicators may be severely disturbed or reduced. 3. Areas with low irreplaceability with respect to biodiversity pattern targets only.
Other Natural Areas (ONA) and transformed	Production landscapes: manage land to optimise sustainable utilisation of natural resources.

During desktop study, the terrestrial biodiversity map shows that the proposed project area falls in the unclassified area, CBA Optimal and some other areas outside the proposed site are covered with CBA: Irreplaceable and Ecological Support Area (see Figure 10). The screening report shows that the proposed project area is of low to very high sensitivity with Critical Biodiversity Area 2, FEPA Sub catchments, Vulnerable

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ecosystem, Strategic Water Source Areas (see Appendix 1). During ground truthing, it was identified that some areas of the proposed site are heavily modified due to cultivation and residential activities. Some of the areas falls in the rocky mountainous area and covered with natural vegetation. The area covered with natural vegetation is a sensitivity area and has ecological and conservation importance of high (see Figure 11). Prospecting should be conducted only on the low sensitive areas or already disturbed area. During prospection process, the applicant must take care to avoid unnecessary disturbance of highly sensitive areas.

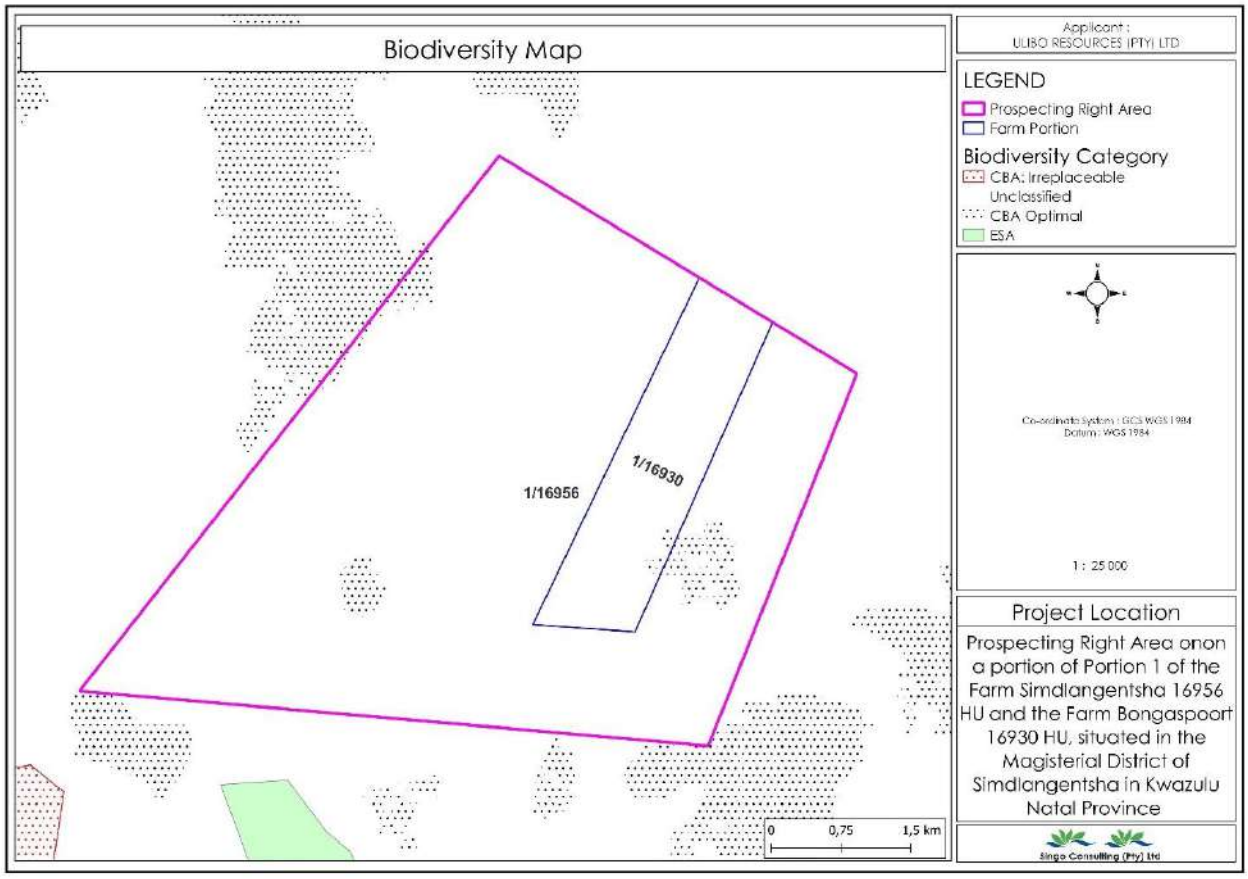

Figure 10: Terrestrial Biodiversity Map

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Figure 11: Area covered with natural vegetation.

During desktop study, the screening report shows that the proposed project area is of low to very high sensitivity with Strategic Water source Area, Wetlands and Estuaries and Freshwater ecosystem priority area quinary catchments (see Appendix 1). Hydrology map depicts that the proposed project area has perennial, and non-perennial rivers (see Figure 12). During site assessment, Mozana river of very high sensitivity was observed onsite (see Figure 13). It is the most sensitive habitat in the project area and represent the area where ecological impacts will be most significant. The applicant must ensure that this area is not disturbed during prospecting activities. A 100m buffer zone from river should be identified and no prospecting activities should occur within the identified buffer zone.

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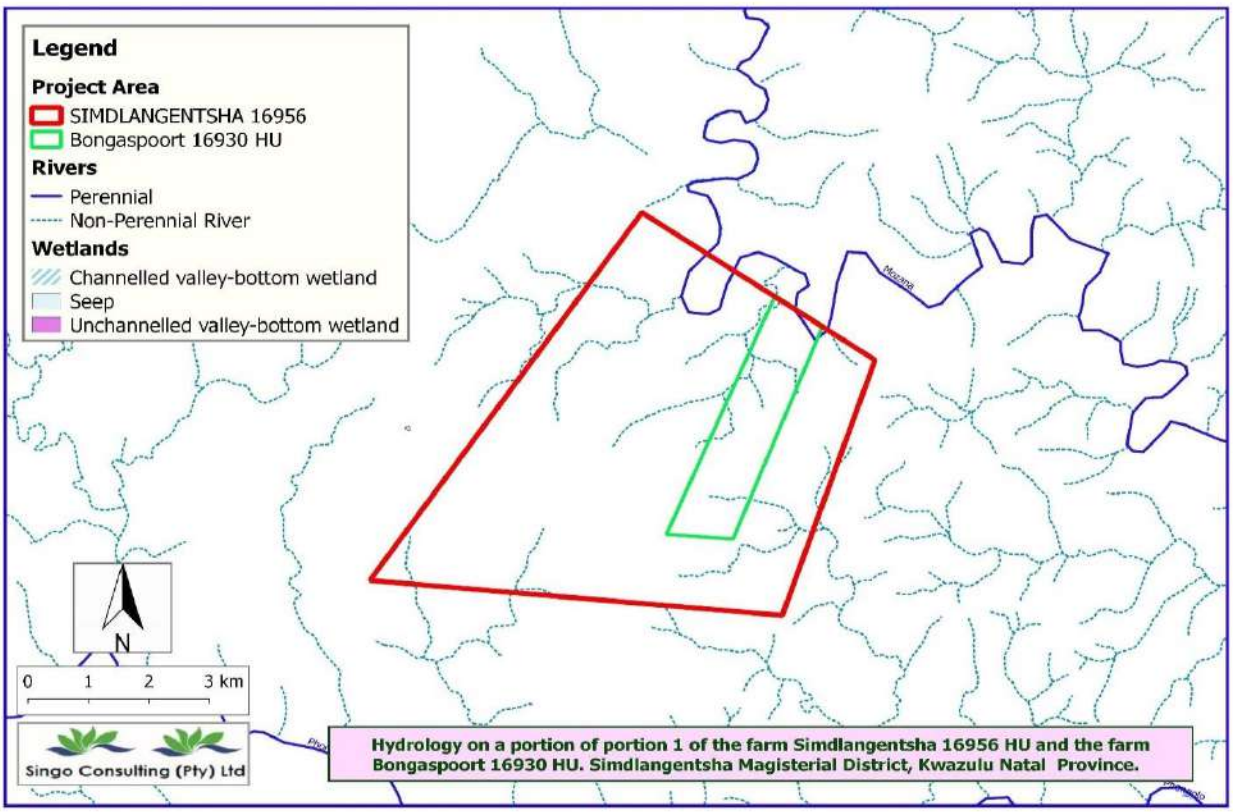

Figure 12: Hydrology Map

Figure 13: Mozana River observed onsite

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7.5 Mammals

During desktop study, the screening report shows that the proposed project area is of low sensitivity with the following mammal species: *Mammalia-Acinonyx jubatus, Mammalia-Lycaon pictus and Mammalia-Ourebia ourebi ourebi* (see Appendix 1). During site assessment, no mammal species of conservation concern were observed onsite; only domestic animals like cattles were observed grazing onsite (see Figure 14).

Figure 14: Cattles observed grazing onsite.

7.6 Avifauna

Birds are considered good ecological indicators, since their presence or absence are indicative of whether the ecosystem is functioning properly or not. Bird communities and ecological conditions are linked to land cover; as the land cover changes, the types of bird species in the area also change. During desktop study, the screening report shows that the proposed project area has no avifauna or bird's species of conservation concern *(*see appendix 1). During ground truthing, no bird's species of conservation concern observed onsite. Bird communities and ecological condition are linked to land cover, as the types of bird species in the area change when land cover changes. Habitat-specific species are sensitive to environmental change, with habitat destruction being the leading cause of species decline worldwide. It is widely accepted that vegetation structure,

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rather than the actual plant species, influences bird species distribution and abundance (Harrison et al., 1997).

7.7 Herpetofauna

During desktop study, the screening report shows that the proposed project area is of medium sensitivity with the following Reptilia species: *Reptilia-Kinixys natalensis* (see Appendix1). During site assessment, no medium sensitivity of invertebrate, reptile and amphibian species observed onsite. This is likely due to the inherently secretive nature of reptile species, and seasonality.

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8 IMPACT ASSESSMENT

8.1 Introduction

The regulations in Chapter 5 of the NEMA requires a description of the potential impacts the proposed development will have on the environment. Table 7 presents details of the potential impacts of the proposed project activities, as well as their proposed mitigation measures.

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Table 7: Assessed impacts.

Impacts and mitigation measures relating to the proposed project										
Activity/ Aspect	**Impact**	**Stage**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Significance after mitigation**
Prospecting excavation /trenching and drilling phase	Destruction of protected plant species and removal of the natural vegetation	Proposed prospecting activities	Negative	Moderate (6)	Site only (1)	Long term (4)	Definite (5)	Medium (55)	1. Use available farm roads to avoid unnecessary disturbance of natural and indigenous vegetation. 2. Supervision by an ecologist to ensure rescue operation success. 3. No natural vegetation and indigenous vegetation areas edge may be cleared/impacted during prospecting. 4. Disturbed areas should be rehabilitated with indigenous plants as soon as prospecting concludes.	Low
	Disturbance to animals on site	Proposed prospecting activities	Negative	Moderate (6)	Local (2)	Short term (3)	High (4)	Medium (44)	1. Do not disturb nests and breeding sites if identified. Do not kill/ capture snakes unless a threat to employees. 2. Dogs or other pets are not allowed on the worksite as they are threats to the natural wild animals. 3. A low-speed limit should be enforced onsite to reduce domestic animal-vehicle collisions 4. No animals should be intentionally killed and poached if identified, and hunting should not be permitted onsite.	Low

Impacts and mitigation measures relating to the proposed project										
Activity/ Aspect	**Impact**	**Stage**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Significance after mitigation**
									5. Severe contractual fines to be imposed and immediate dismissal of any contract employee who is found attempting to snare or otherwise harm fauna onsite. 6. Hunting weapons are prohibited onsite. 7. Contract employees to be educated about the value of wild animals that might be identified and the importance of their conservation. 8. ECO to conduct regular site inspections and remove any snares or traps erected on site. 9. Employees and contractors should be made aware of the presence of, and rules regarding, flora and fauna through suitable training and on-site signage.	
	Increased soil erosion, increase in silt loads and sedimentation	Proposed prospecting activities	Negative	Moderate (6)	Local (2)	Medium term (3)	High (4)	Medium (44)	1. Following prospecting activities, rehabilitation of disturbed areas is required. 2. Existing agricultural land contours to be restored immediately after prospecting. 3. Conduct prospecting only on the proposed area. 4. Implement erosion and storm water runoff management measures according to EMP	Low

Impacts and mitigation measures relating to the proposed project										
Activity/ Aspect	**Impact**	**Stage**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Significance after mitigation**
									requirements to prevent erosion on the prospected areas and surroundings. 5. Backfill excavated trenches immediately with onsite excavated material after collection of samples and capping of boreholes. 6. Monitor excavated areas for signs of erosion for at least six months after sampling and implement erosion rectification and prevention measures if required.	
	Establishment and spread of declared weeds	Proposed prospecting activities	Negative	Moderate (6)	Regional (3)	Permanent (5)	High (4)	Medium (56)	1. Only topsoil and excavated materials removed from the prospected site to backfill and rehabilitate impacted areas. 2. The best mitigation measure for alien and invasive species is the early detection and eradication of these species using a monitoring programme. 3. An alien invasive management programme to be developed and implemented to control alien invasive species.	Low
Waste generation during prospecting	Pollution due to oil and fuel spills,	Proposed prospecting activities	Negative	Moderate (6)	Local (2)	Long term (4)	Definite (5)	High (60)	1. Proper ablution and storage facilities must be provided on site.	Low

Impacts and mitigation measures relating to the proposed project										
Activity/ Aspect	**Impact**	**Stage**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Significance after mitigation**
excavation /trenching and drilling phase	erosion, and ablution facilities.								2. Put proper SOPs in place regulating refuelling and other potential pollution. 3. Have rehabilitation strategy as part of EMP, like a clean-up plan/ strategy if spills occur and proper facilities (ablution) to ensure no sewage spills into drainage lines and streams.	
Wetland destruction during Prospecting excavation /trenching and drilling phase	Prospecting on wetlands, CBA, and ESA	Proposed prospecting activities	Negative	High (8)	Local (2)	Long term (4)	Definite (5)	High (70)	1. Disturbance should not be allowed in drainage lines, rivers, and wetlands. This includes no prospecting across wetlands, rivers, dumping of fill, no roads, and all forms of temporary disturbance, to ensure continued stability and functioning of river systems. 2. Prospecting to be carefully monitored to avoid unnecessary impacts on wetlands/riparian areas (particularly in-stream habitat); should be approved by WUL. 3. No prospecting activities may occur within 100m from any wetland area without determining conditions for water use license from the DWS. 4. Storm water and erosion control measures to be implemented and monitored as per EMP to prevent	Low

Impacts and mitigation measures relating to the proposed project										
Activity/ Aspect	**Impact**	**Stage**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Significance after mitigation**
									erosion of sensitive environment on site. 5. Do not lower the original stream bed/profile of the wetland as this may result in scouring in an upstream direction and further alteration of bed conditions.	

9 CONCLUSION AND RECOMMENDATIONS

During site assessment, the Mozana perennial river was identified onsite. The identified river was found to have high ecological importance and high conservation importance as it provides livestock with drinking water, habitat for aquatic animals and form part of the sources of freshwater in south Africa. The Mozana river is considered highly sensitive area where ecological impacts would be more significant. All the proposed buffer-zones as per the wetland assessment report should be considered to conserve the river. Therefore, when choosing areas to be prospected, the applicant should avoid disturbance of the sensitive areas. In case if drilling must occur in the regulated area, a permit application needs to be lodged with DWS prior to any disturbance of the sensitive area. A permit application should be lodged in terms of Section 21 (I) and (C) of the (National water Act NO. 36 of 1998).

Some of the proposed areas onsite were covered with natural vegetation. The areas covered with natural vegetation have high conservation importance as they provide suitable habitat and feeding areas for livestock and wild animals species. Vegetation should not be cleared, as it leads to habitat loss, degradation and fragmentation including, inter alia, exotic species encroachment and dust generation. The applicant must ensure that animals should not be intentionally killed/poached if identified onsite. There should be a relocation of any threatened mammal species identified onsite before commencement of prospecting.

These impacts can be mitigated through correct and active management. Proper rehabilitation and after-care of the prospected area needs to take place to prevent the colonisation of the areas by invader species. It is recommended that the management measures stipulated in this report be included in the proposed project's official EMP and that these be assessed for efficacy during all phases of the project and adapted accordingly to ensure minimal disturbance of the study area ecology.

Other specific conclusions and recommendations include:

1. All ablution facilities must be placed far away from the waterbodies.
2. When placing structures in the prospecting area, highly sensitive areas must be avoided.

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3. An alien and invasive management plan, as well as emergency preparedness plan during spillages must be always adhered to.
4. Excavated areas must be rehabilitated to avoid or limit erosion.
5. Drilled boreholes must be capped to avoid injuries to animals.

The destruction of the natural habitat in the proposed area is inevitable. The significance of the impacts will be determined by the success of the mitigation measures implemented and the rehabilitation programme for the prospecting area.

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Appendix 1: Screening report

SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED DEVELOPMENT FOOTPRINT ENVIRONMENTAL SENSITIVITY

EIA Reference number: New Application

Project name: Portion of portion 1 of the farm Simdlangentsha 16956 HU and the farm Bongaspoort 16930 HU

Project title: Portion of portion 1 of the farm Simdlangentsha 16956 HU and the farm Bongaspoort 16930 HU

Date screening report generated: 12/04/2022 09:17:51

Applicant: Ulibo Resources (Pty) Ltd

Compiler: Singo Consulting (Pty) Ltd

Compiler signature: Mopoko

Application Category: Mining|Prospecting rights

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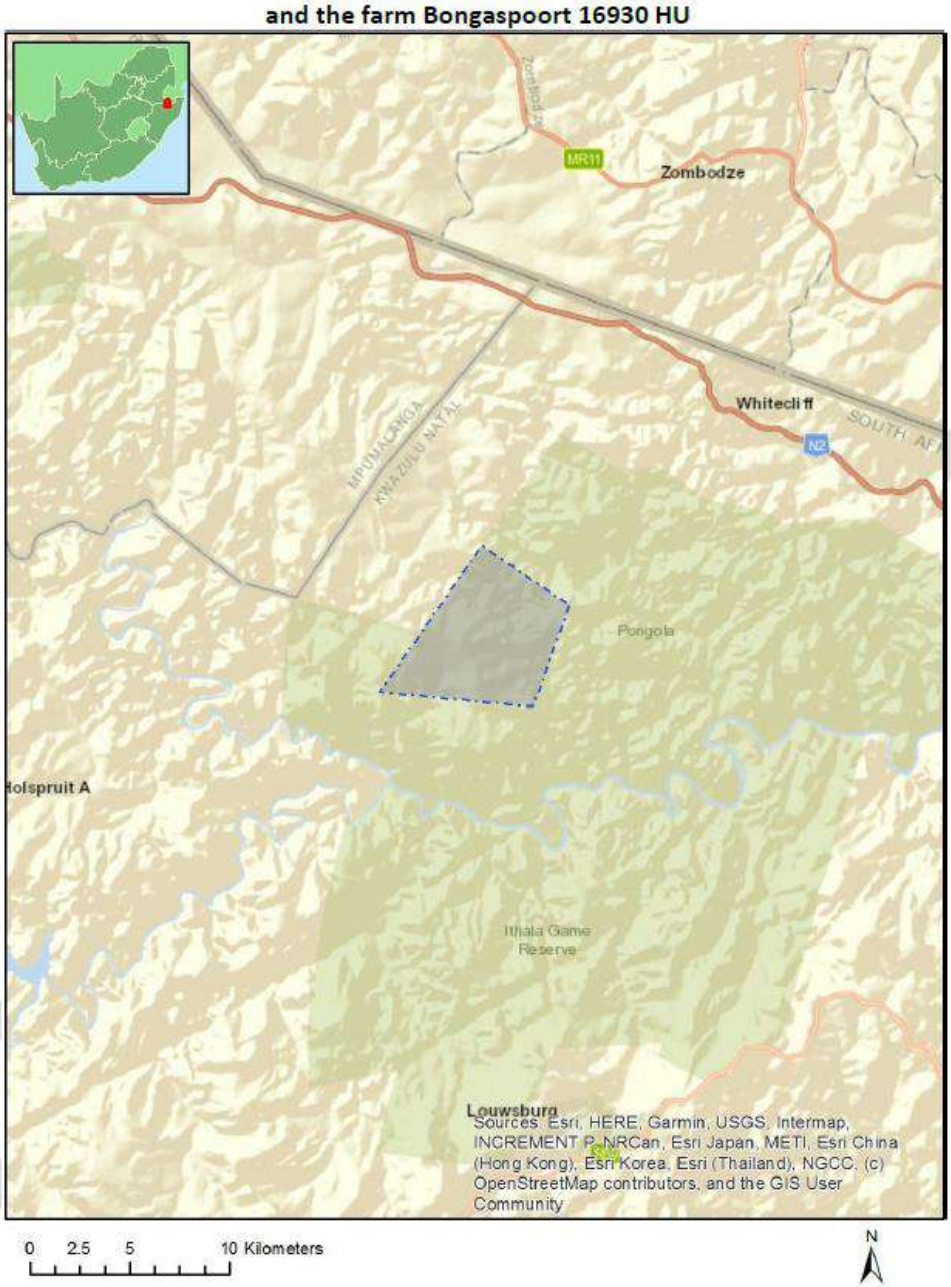
Proposed Project Location

Orientation map 1: General location

General Orientation: Portion of portion 1 of the farm Simdlangentsha 16956 HU and the farm Bongaspoort 16930 HU



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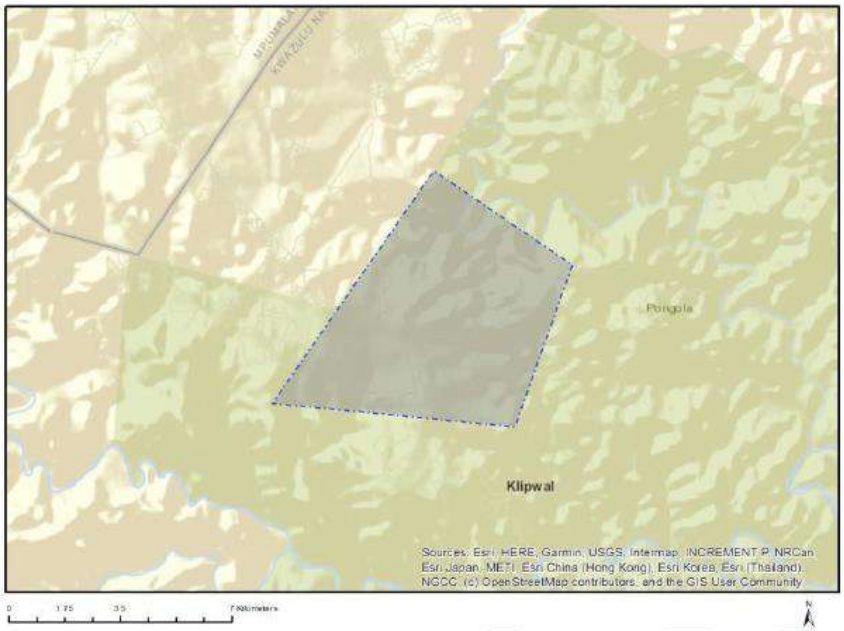
Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	BONGASPOORT	16930	0	27°22'53.04S	31°16'0.15E	Farm
2	ORANJEDAL	18354	0	27°20'30.58S	31°13'6.84E	Farm
3	SIMDLANGENTSHA	16956	0	27°21'59.77S	31°20'35.87E	Farm
4	SIMDLANGENTSHA	16956	0	27°22'59.89S	31°9'23.43E	Farm Portion
5	SIMDLANGENTSHA	16956	10	27°22'59.89S	31°9'23.43E	Farm Portion
6	ORANJEDAL	18354	1	27°20'31.19S	31°13'6.88E	Farm Portion
7	BONGASPOORT	16930	1	27°22'53.04S	31°16'0.15E	Farm Portion
8	SIMDLANGENTSHA	16956	1	27°20'19.19S	31°16'51.66E	Farm Portion

Development footprint[1] vertices:

Footprint	Latitude	Longitude
1	27°20'51.75S	31°14'57.73E
1	27°22'16.85S	31°17'17.91E
1	27°24'42.2S	31°16'19.79E
1	27°24'21.19S	31°12'13.77E
1	27°20'51.75S	31°14'57.73E

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Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No nearby wind or solar developments found.

Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development footprint as well as the most environmental sensitive features on the footprint based on the footprint sensitivity screening results for the application classification that was selected. The application classification selected for this report is:
Mining|Prospecting rights.

Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this footprint are indicated below.

No intersection with any development zones found.

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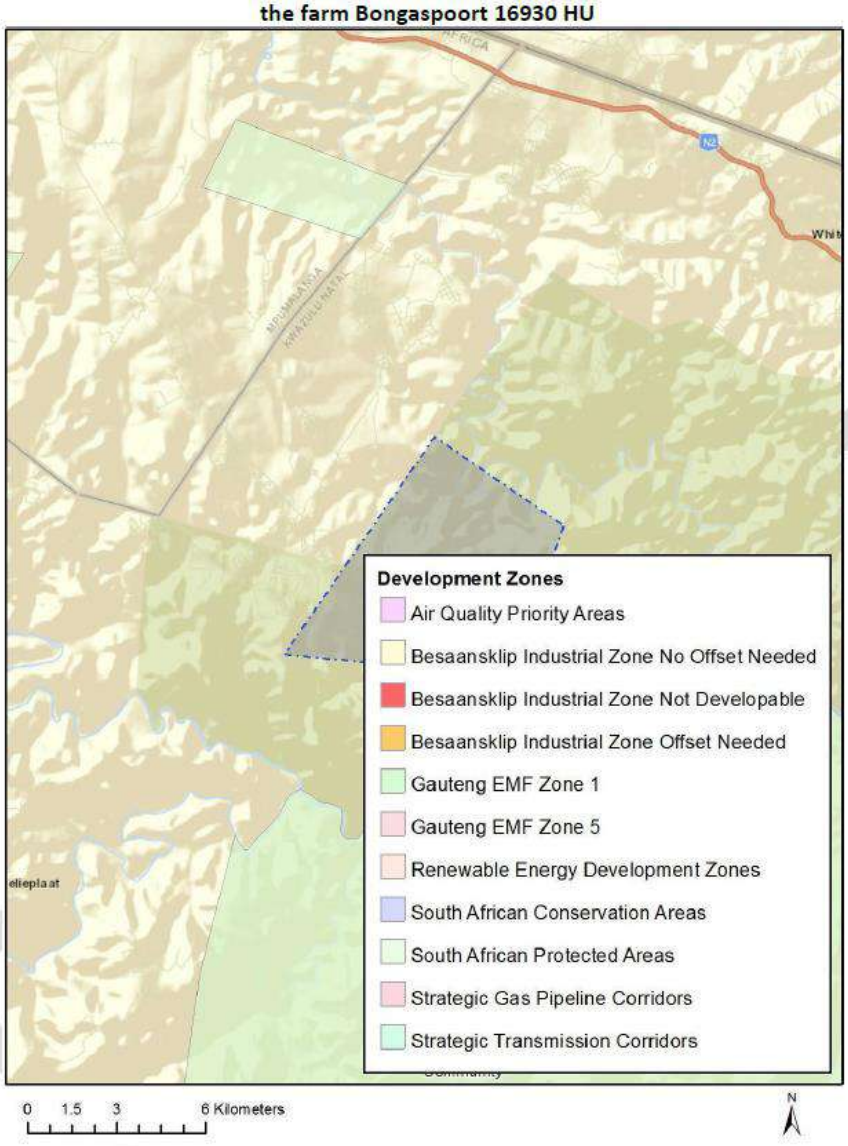
Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones

Project Location: Portion of portion 1 of the farm Simdlangentsha 16956 HU and the farm Bongaspoort 16930 HU



Proposed Development Area Environmental Sensitivity

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

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity

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Agriculture Theme		X		
Animal Species Theme			X	
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme			X	
Defence Theme				X
Paleontology Theme			X	
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the footprint situation.

No	Specialist assessment	Assessment Protocol
1	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Agriculture_Assessment_Protocols.pdf
2	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
3	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
4	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
5	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Aquatic_Biodiversity_Assessment_Protocols.pdf

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6	Noise Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Noise_Impacts_Assessment_Protocol.pdf
7	Radioactivity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
8	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Plant_Species_Assessment_Protocols.pdf
9	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Animal_Species_Assessment_Protocols.pdf

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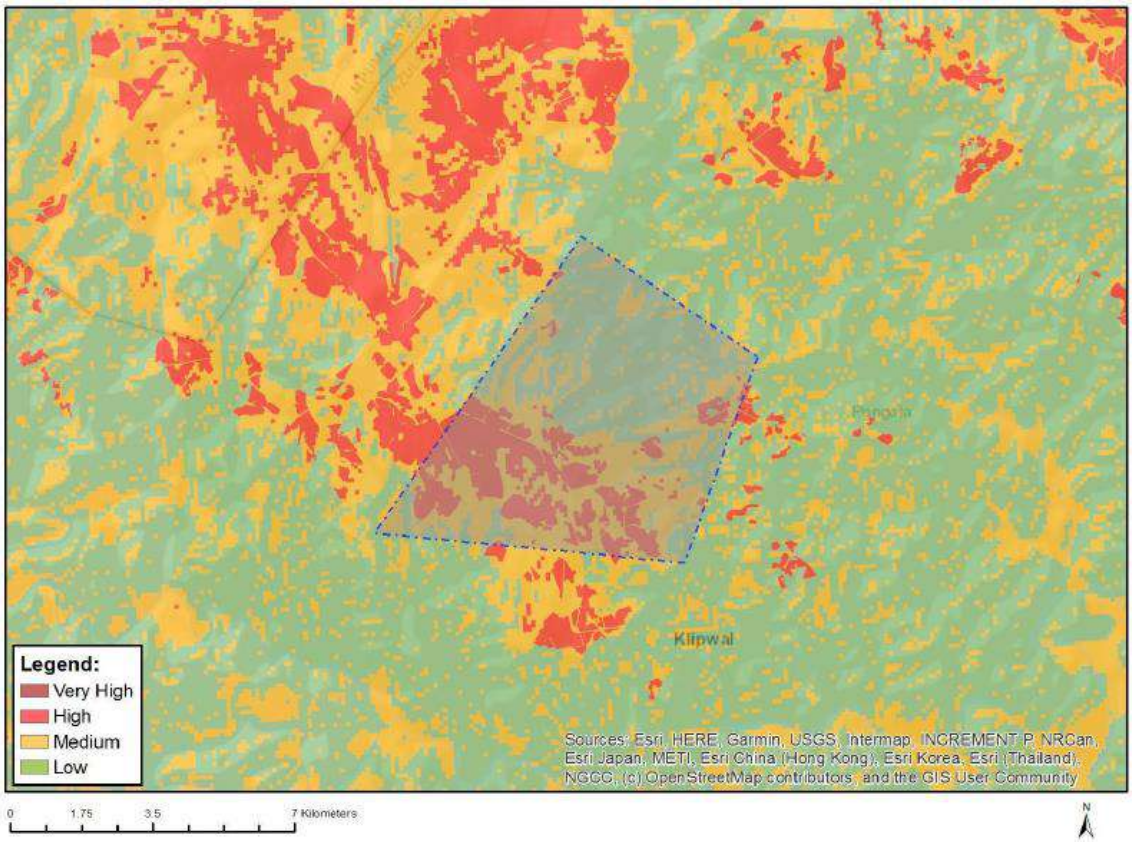
Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed footprint for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Land capability;09. Moderate-High/10. Moderate-High
High	Subsistence Farming 1;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
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
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

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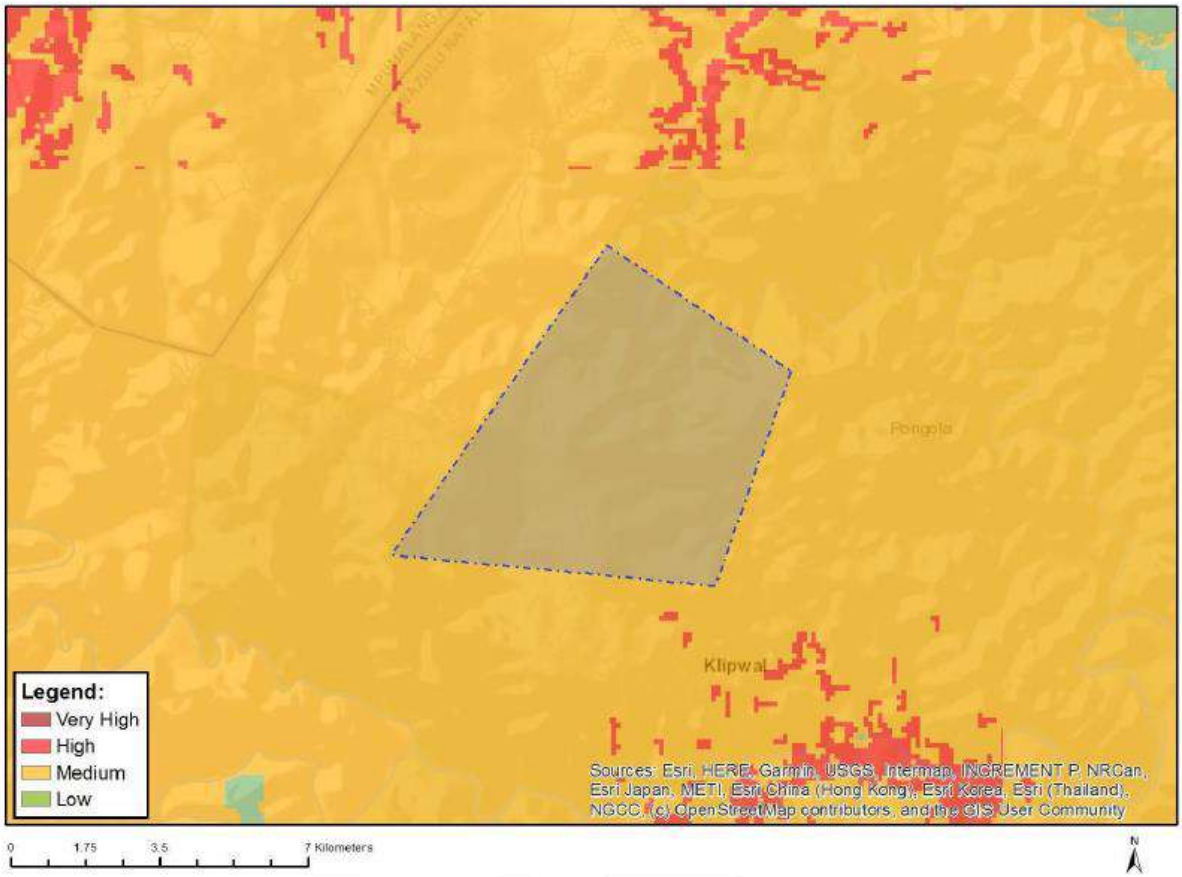
MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



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Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Medium	Mammalia-Acinonyx jubatus
Medium	Mammalia-Lycaon pictus
Medium	Mammalia-Ourebia ourebi ourebi
Medium	Sensitive species 1
Medium	Reptilia-Kinixys natalensis

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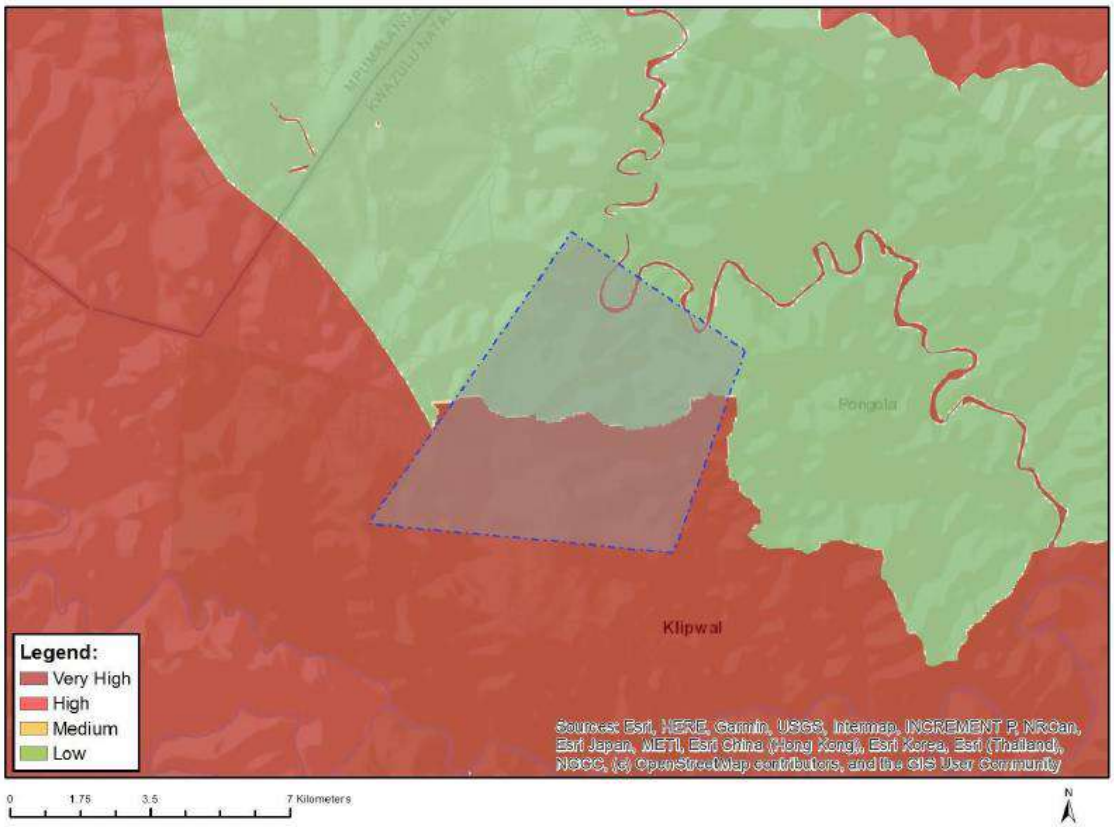
MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Very High	Strategic water source area
Very High	Wetlands and Estuaries
Very High	Freshwater ecosystem priority area quinary catchments

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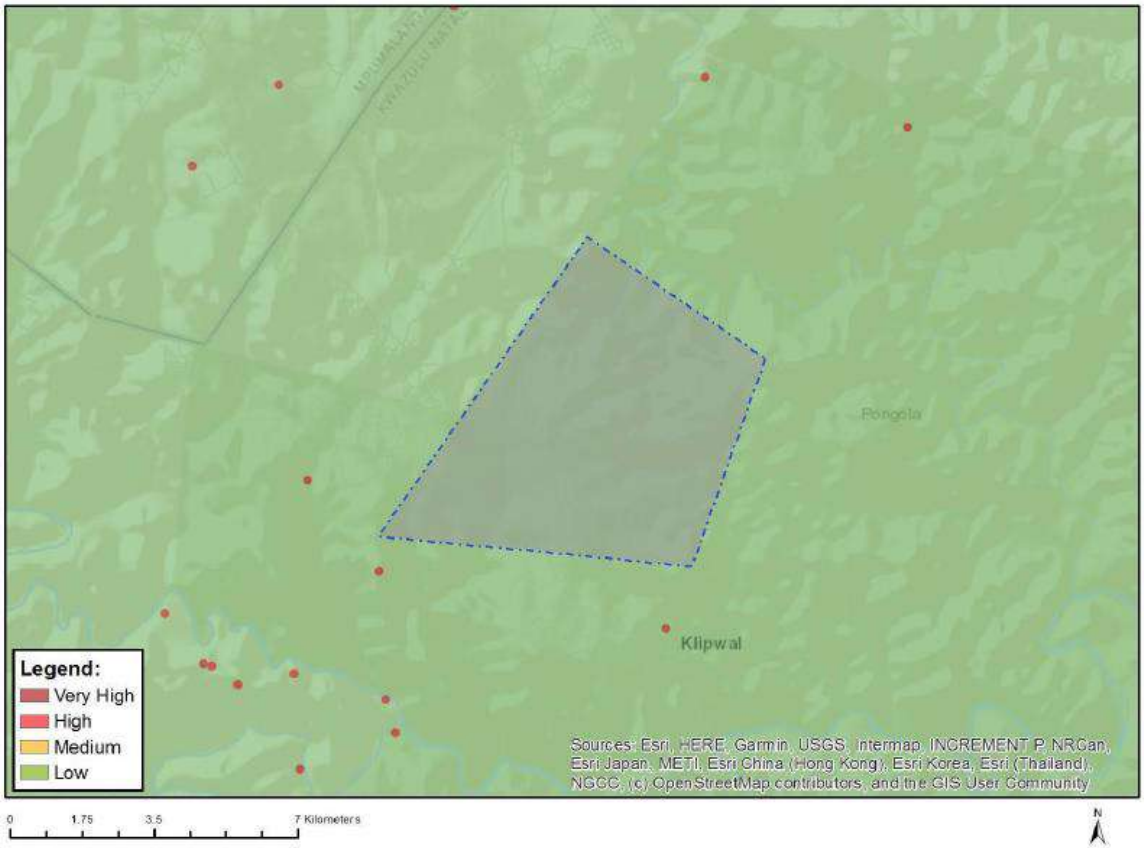
MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity

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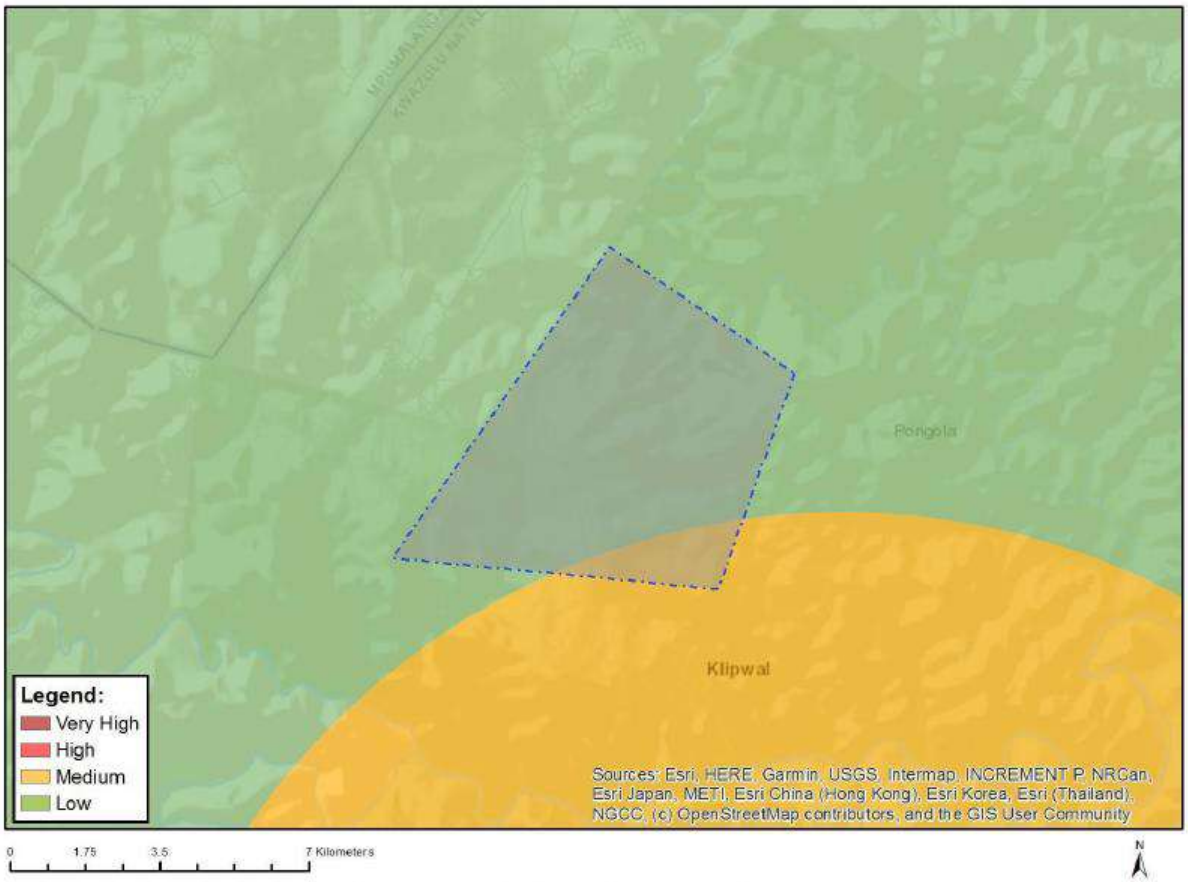
MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Medium	Between 8 and 15 km of other civil aviation aerodrome

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MAP OF RELATIVE DEFENCE THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

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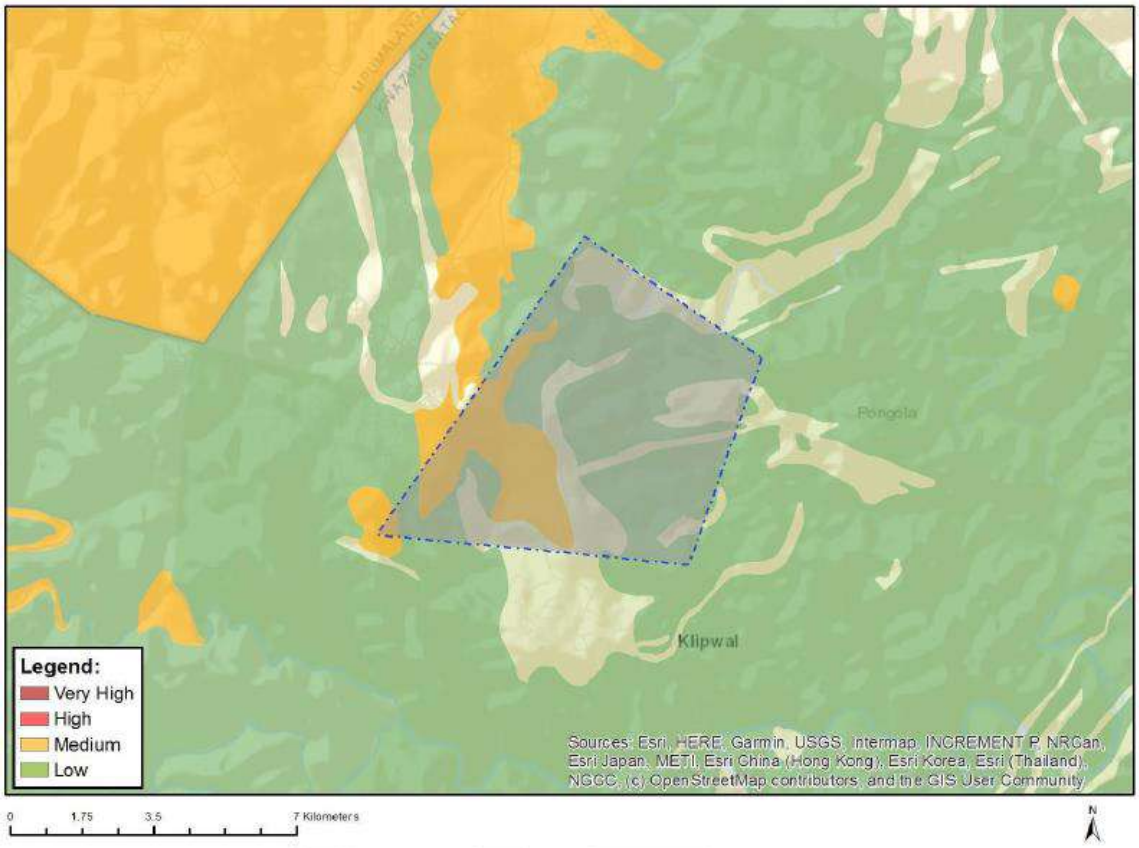
MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Features with a Low paleontological sensitivity
Medium	Features with a Medium paleontological sensitivity

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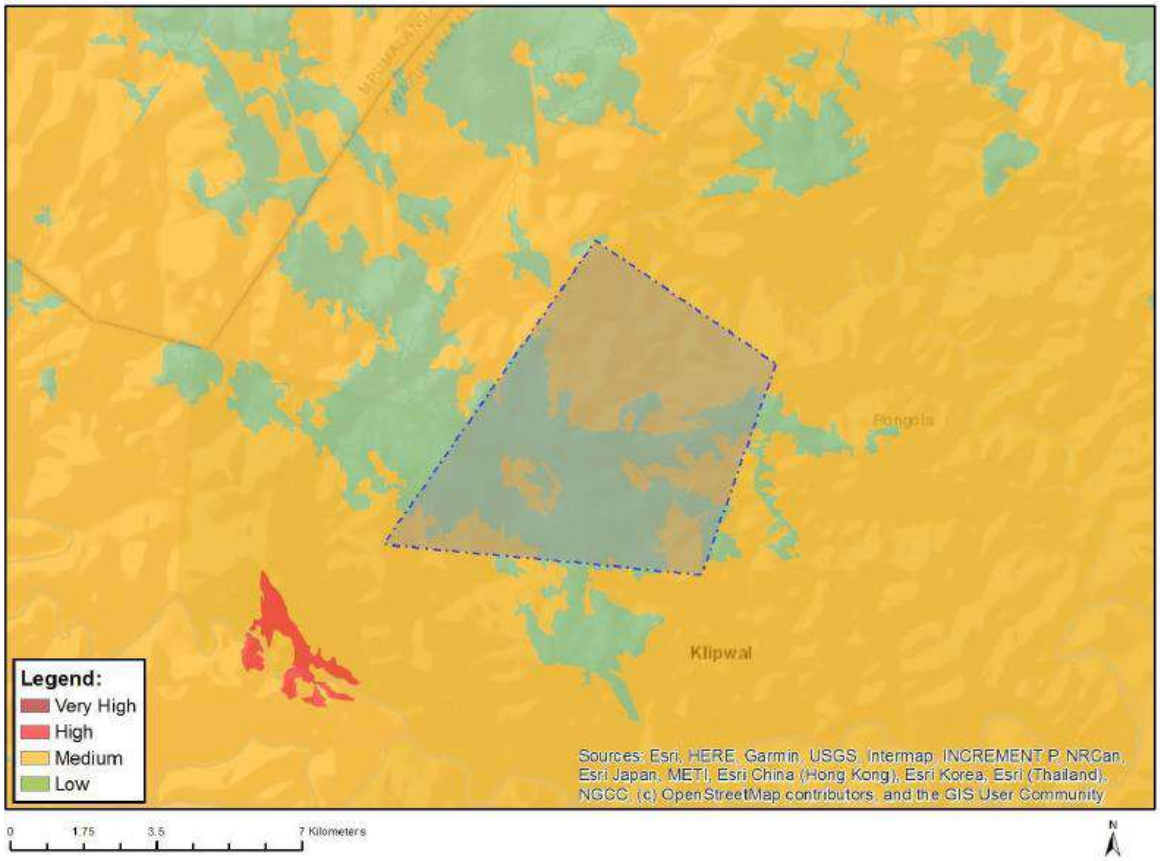
MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



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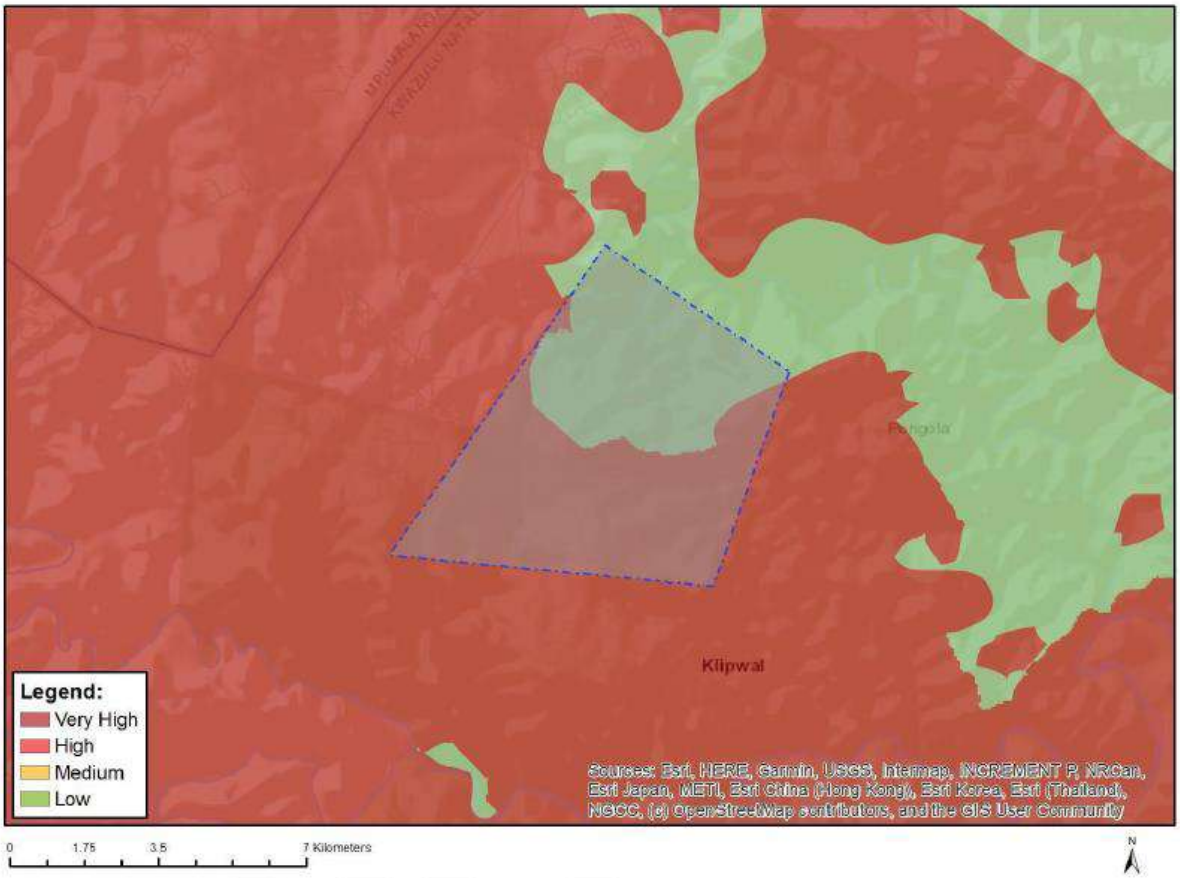
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Sensitive species 1252
Medium	Protea comptonii
Medium	Sensitive species 427
Medium	Melanospermum italae
Medium	Dierama erectum
Medium	Thorncroftia longiflora
Medium	Lotononis amajubica
Medium	Leucospermum gerrardii
Medium	Sensitive species 998
Medium	Sensitive species 1152
Medium	Sensitive species 313
Medium	Gerbera aurantiaca

Medium	Sensitive species 45

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	Critical biodiveristy area 2
Very High	FEPA Subcatchments
Very High	Strategic Water Source Areas
Very High	Vulnerable ecosystem

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