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The Regional Manager
Private bag X 54307
Durban 4000
333 Anton Lembede Street

Attention: Karoon Moodley

14 February 2025

SUBMISSION: BASIC ASSESSMENT REPORT (BAR) AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT (EMPr) FOR THE PROPOSED PROSPECTING RIGHT APPLICATION FOR COAL IN RESPECT THE FARM IN FARM MTHEMBU 17538 GT, FARM LOTMGA 8761 GT, FARM KAISHA 14719 GT, FARM OSAKA 12977 GT, FARM KROMPOORT 2155 GT, FARM EMAWENI 18034 GT AND FARM UITKYK 2156 GT IN THE ESTCOURT DISTRICT, KWAZULU-NATAL PROVINCE.

DMRE Ref No: KZN 30/5/1/1/2/ 11694 PR

The above-mentioned matter bear's reference:

We hereby submit the environmental documents required for the above-mentioned application. We are submitting the following:

1. Basic Assessment Report and Environmental Management Programme.
2. Supporting documents attached as appendices
3. Specialist Studies

Hope you find the above in order.

Kind Regards

Sunday M Mabaso
Vahlengwe Mining Advisory and Consulting

SAQONDISANA INVESTMENT

BASIC ASSESSMENT REPORT (BAR) AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT (EMPr)

BASIC ASSESSMENT REPORT (BAR) AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR THE PROPOSED PROSPECTING RIGHT APPLICATION FOR COAL IN RESPECT OF THE FARM IN FARM MTHEMBU 17538 GT, FARM LOTMGA 8761 GT, FARM KAISHA 14719 GT, FARM OSAKA 12977 GT, FARM KROMPOORT 2155 GT, FARM EMAWENI 18034 GT AND FARM UITKYK 2156 GT IN THE ESTCOURT DISTRICT, KWAZULU-NATAL PROVINCE.

FILE REFERENCE NUMBER SAMRAD: KZN 30/5/1/1/2/ 11694 PR

NAME OF APPLICANT: Saqondisana Investment

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FILE REFERENCE NUMBER SAMRAD: KZN 30/5/1/1/2/11694 PR

February 2025

This document has been prepared by:

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Prepared for:

Saqondisana Investment

Name	Responsibility	Signature	Date
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Dimakatso Leholi	Report Reviewer	D. Leholi	February 2025
Mulalo Mafunisa	Stakeholder Engagement		February 2025
Lusizo Nqasha	GIS Consultant		February 2025
Sunday M Mabaso	Project Manager/Reviewer		February 2025

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IMPORTANT NOTICE

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

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

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

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

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 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

LIST OF ABBREVIATIONS

Table 1: List of abbreviations

BAR	Basic Assessment Report
BID	Background Information Document
DEA	Department of Environmental Affairs
DMRE	Department of Mineral Resources and Energy
CBA	Critical Biodiversity Area
CARA	Conservation of Agricultural Resources Act (Act No. 43 OF 1983)
CRR	Comments and Responses Report
DFFE	Department of Forestry, Fisheries, and the Environment (DFFE)
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act, 1989 (Act No. 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GNR	Government Notice Regulation
Ha	Hectares
I&APs	Interested and Affected Parties
Km	Kilometer's
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NAAQS	National Ambient Air Quality Standards
NBA	National Biodiversity Assessment
NCR	Noise Control Regulations Act, 1989 (Act 73 of 1989)
NFEPA	National Freshwater Ecosystem Priority
NEM: AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM: BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

NEM: WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NFEPA	National Freshwater Ecosystem Priority Area
NPA	National Protected Area
PPP	Public Participation Process
PR	Prospecting Right
PWP	Prospecting Work Programme
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANS	South African National Standard (SANS) 10103
WMA	Water Management Area

EXECUTIVE SUMMARY

Saqondisana Investment, hereafter referred as 'the applicant' or 'Saqondisana' has applied for a prospecting right for coal in respect of the Farm in Farm Mthembu 17538 GT, Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT, Farm Emaweni 18034 GT and Farm Uitkyk 2156 GT in the District of Estcourt District, KwaZulu-Natal Province, for an extent area of is 2711 ha. The prospecting area is situated 36,63 km East south of Ladysmith town and 29,60 km East south of Umbulwana Village and access road to the farm is via the R74 road, in the Estcourt District in KwaZulu Natal Province.

The application for a prospecting right is in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (as amended) (MPRDA), and therefore, an Environmental Impact Assessment (EIA) process is required to acquire an Environmental Authorisation in terms of Section 24 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (as amended) (NEMA). Vahlengwe Mining Advisory and Consulting (Pty) Ltd, hereafter 'Vahlengwe' has been appointed by Saqondisana as an independent Environmental Assessment Practitioner (EAP) to facilitate the Environmental Authorisation (EA) processes for the proposed prospecting activities. The competent authority for the environmental authorisation processes an environmental risk assessment to identify the significance of the impacts. The environmental impact assessment considered all phases of the project, including the site establishment, operational, rehabilitation and closure. The rating system used is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact.

The stakeholder engagement process, as part of the Environmental Authorisation process was conducted in terms of NEMA (as amended), which provides clear guidelines for stakeholder engagement during an EIA. Stakeholders were afforded an opportunity to participate in the public review of the Draft BAR from 06 September 2024 – 06 October 2024 to ensure that the assessment of impacts and proposed management of impacts address their concerns. Comments received during the 30-day comment period (from the Draft BAR review) are incorporated into this report, to be submitted to DMR for decision-making.

Details of the Applicant.

Table 1: Details of the applicant

Name of Applicant:	Saqondisana Investment		
Registration number (if any):	2023/23084/07		
Trading name (if any):	Saqondisana Investment		
Responsible person: (E.g., CEO, Director, etc.)	Niel Van Zyl		
Contact person:	Niel Van Zyl		
Physical address:	Plot 1 AH, Sapfo Valtaki, Gauteng		
Postal address:	Plot 1 AH, Sapfo Valtaki, Gauteng		
Postal code:	1020	**Cellphone:**	+27 82 461 3787
Email:	vanzydp@gmail.com		

Environmental Consultants

Vahlengwe Mining Advisory and Consulting (Pty) Ltd is the appointed independent Environmental Assessment Practitioner (EAP) to undertake the Basic Assessment Process for the EA application for the proposed prospecting project for coal in respect of the Farm in Farm Mthembu 17538 GT, Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT, Farm Emaweni 18034 GT and Farm Uitkyk 2156 GT in the District of Estcourt District, KwaZulu-Natal Province

Table 2: Details of the EAPs

Company name:	Vahlengwe Mining Advisory and Consulting (Pty) Ltd
Contact person:	Sunday M Mabaso
Physical address:	238 Voster Ave, Glenvista Extension 3, Johannesburg South, 2058
Telephone:	+2711 432 0062
Email:	info@vahlengweadvisory.co.za

Public Participation Process Methodology

A Public Participation Process (PPP) was undertaken as required in terms of the EIA Regulations, 2014 (as amended), promulgated under NEMA. During the undertakings of the PPP, the environmental and social impacts are investigated, and any stakeholder who is directly or indirectly affected by the project was given an opportunity to comment, raise concerns and contribute to the assessment to ensure that local knowledge, needs, and values are understood

and taken into consideration throughout the process.

The Draft Basic Assessment Report was made available for public review and comment for a period of 30 days and all comments or concerns raised have been recorded and responded to in the Comments and Responses Report (CRR). The comment period commenced from (**06th of September 2024 to the 06th of October 2024).**

The following activities were undertaken to announce the project and initiate the Basic Assessment process:

- A Background Information Document (BID) including an Interested and Affected Parties Registration Forms (IAPs) handed and distributed to various stakeholders including the I&APs via email from the **19th of September 2024**.
- A newspaper advertisement was placed in the Ladysmith Gazette **Newspaper** on the **06th of September 2024.**
- Site notices were erected at various places within the vicinity of the site on the **19th September 2024;**
- An electronic copy can be accessed and downloaded from the www.vahlengweadvisory.co.za from the **06th September 2024**. Final BAR to be accessed from the 25th of February 2025.

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SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1. Introduction

Saqondisana proposes to undertake coal prospecting activities in respect of the Farm in Farm Mthembu 17538 GT, Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT, Farm Emaweni 18034 GT and Farm Uitkyk 2156 GT in the District of Estcourt District, KwaZulu-Natal Province, for an extent area of is 2711 ha. The prospecting area is situated 36,63 km East south of Ladysmith town and 29,60 km East south of Umbulwana Village and access road to the farm is via the R74 road, in the Estcourt District in KwaZulu-Natal Province.

The proposed prospecting activities will include non-invasive and invasive techniques. The planned invasive activities will cover an area of about 0.305 ha. The project entails the drilling of at least twenty (20) boreholes to determine the mineral deposition, quantity, economic viability, and possibilities of the project leading to a viable mine. A 165mm diameter core drill will be used to drill the geological boreholes.

The prospecting activities will be undertaken in 2-5 phases for a total duration month 13 – month 48, thus five years with subject to renewal for and 3 years should the prospecting programme not be completed within the first term of granting.

2. Contact Person and correspondence address.

2.1 Details of the EAP

Table 3: Details of the EAP

Company name:	Vahlengwe Mining Advisory and Consulting (Pty) Ltd
Contact person:	Sunday M Mabaso
Physical address:	238 Voster Ave, Glenvista Extension 3, Johannesburg South, 2058
Telephone:	+27 11 432 0062
Email:	info@vahlengweadvisory.co.za

2.2. Expertise of the EAP

2.2.1 The qualifications of the EAP (with evidence as **Appendix 1**)

This section describes the EAP's qualifications and experience for the proposed Project. Appendix A contains the EAPs' curriculum vitae and degrees.

Table 4: Expertise of the EAP

NAME	Sunday M Mabaso
QUALIFICATIONS	GDE: Mining Engineering, Certificate: Mine Closure and Rehabilitation, MBA, Postgrad Certificate: Climate Change and Energy Law
RESPONSIBILITY ON PROJECT	Project Manager
PROFESSIONAL REGISTRATION	EAPASA (Reg. No. 2022/4485)
EXPERIENCE	Sunday M. Mabaso is the Principal Consultant with over 4 years in consulting coupled with more than 20 years of service at the Department of Mineral Resources and Energy of which he served seven (7) years as a Regional Manager (3 years in Northern Cape and 4 years in Gauteng). He has acquired various qualifications in mining and has recently completed an MBA with Milpark Business School and a Post Graduate Certificate in Climate Change and Energy Law with the University of the Witwatersrand, Mine Closure and Rehabilitation with the University of Pretoria. His experience includes monitoring and enforcing compliance with Social and Labour Plan and Mine Economics in terms of the MPRDA and the Mining Charter, Environmental Management and Waste Management in terms of NEMA and NEM: Waste Act.
NAME	Khanyile Mgiba-Mutero
QUALIFICATIONS	Higher Certificate in Life and Environmental Science
RESPONSIBILITY ON PROJECT	Report Compiler (TRAINEE)
PROFESSIONAL REGISTRATION	SACNASP Student (169444)
EXPERIENCE	Khanyile Mgiba-Mutero is an environmental trainee who has 2 years working experience in the Environmental Management field. She has a University of South Africa Higher Certificate in Life and Environmental Science and is currently studying towards BA in Environmental Management 3rd Level at the University of South Africa. She has performed environmental assessments (BAR), Mine Closure and Water Use Licence Application (WULA), and environmental compliance auditing. Her core competencies include research and report writing.

3. Location of the overall Activity

Table 5: Details of the overall activity location

Farm Name:	Situated in the Farm Mthembu 17538 GT, Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT, Farm Emaweni 18034 GT and Farm Uitkyk 2156 G.
Application area (Ha)	2711ha
Magisterial district:	District of Estcourt, KwaZulu Natal Province
Distance and direction from nearest town	The prospecting area is situated 36,63 km East south of Ladysmith town and 29,60 km East south of Umbulwana Village and access road to the farm is via the R74 road, in the Estcourt District in KwaZulu Natal Province
21-digit Surveyor General Code for each farm portion	N0GT00000001753800001 N0GT00000001753800002 N0GT00000001753800004 N0GT00000001753800005 N0GT00000001803400000 N0GT00000000215500000 N0GT00000000876100000 N0GT00000001471900000 N0GT00000000920100000 N0GT00000001297700000

4. Locality map

Attach a locality map at a scale not smaller than 1:250000 showing the nearest town and attach as **Appendix 2**

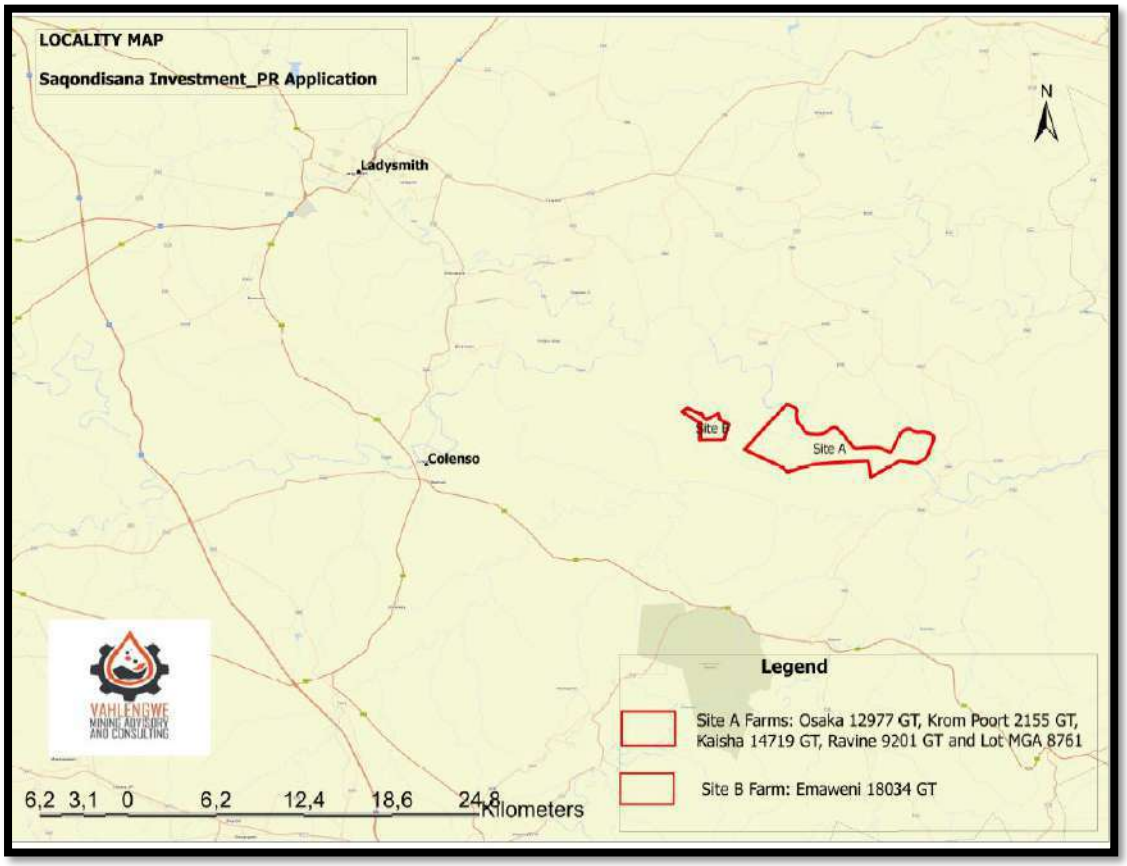


Figure 1: Locality map of the proposed area.

5. Description of the scope of the proposed overall activity

Attach 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.

Saqondisana proposes to undertake coal prospecting activities in respect of the Farm Situated in the Farm Mthembu 17538 GT, Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT, Farm Emaweni 18034 GT and Farm Uitkyk 2156 G. In the District of Estcourt, KwaZulu-Natal Province. The planned invasive prospecting activities will cover an area of at least 0.305 ha (boreholes). The project entails the drilling of about twenty (20) boreholes to determine the mineral deposition, quantity, economic viability, and possibilities of the project leading to a viable mine. Access to the prospecting area will be through existing roads.

5.1. Listed and specified activities

Table 2: Listed and specified activities

NAME OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA OR M²)	APPLICABLE LISTING NOTICE *GNR 983, GNR 984 or GNR 985*
Prospecting Right application area	2711 ha	GNR 984 (as amended)
Planned invasive drilling 20 boreholes at a maximum depth of 200m with each borehole sump area of 10m length x 10m breath	0.2 ha	GNR 984 (as amended)
Site clearing (30m x 30m)	0.09 ha	Not Listed
Geophysical survey	2711 ha	Not Listed
Geological field mapping	2711 ha	Not Listed
Access roads (3m x 50m)	0.015 ha	Not listed

5.2. 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).

The prospecting activities will include the following activities:

- **Establishment of the office and equipment storage site:**

The site will be cleared of vegetation and levelled where the mobile site offices will be installed. No topsoil will be removed for this activity. Vegetation clearance of an extent area of 30x30m will be undertaken for the establishment of the site camp offices and auxiliary equipment for the operation.

- **Installation of mobile offices and ablutions.**

Mobile offices and portable ablutions will be installed on the established site.

- **Construction of temporal access road to the camp.**

Temporal access roads to the site camp and drill sites will be constructed within the proposed area. However, existing farm roads will be utilized as far as practicable.

- **Drilling; and**

Drilling of twenty (20) boreholes will be undertaken using a grid drilling pattern to a maximum

depth of 200 m with each borehole sump area of 10m length x 10m breath.

- **Rehabilitation and closure.**

Concurrent rehabilitation of the drill holes will be conducted after each drilling is completed. The drill holes will be backfilled with material in their respective manner and the drilled hole to be closed with a cap. The final rehabilitation of the site will be conducted including the rehabilitation of the office and equipment storage site footprint, drill sites and access roads. The rehabilitation plan will be included within the EMPr which forms part of this report to be submitted to the Department of Mineral Resources and Energy (DMRE).

Project Phases

The prospecting activities will be undertaken in four (4) phases for a total duration of about 48 months, thus five years with the subject of renewal for 3 years should the prospecting programme not be completed within the first term of granting. The prospecting phases will be conducted as follows:

Phase 1

- Desktop Studies

A desktop study will be carried out to obtain all possible geological information and historical data of the proposed prospecting area. These include the review of published geological reports, data from the Council for Geoscience and relevant geological research within the proposed area.

- Reconnaissance Survey

A geological reconnaissance survey of the proposed area will be undertaken to assess the potential ore bodies and to comparatively evaluate the preferred ore. This survey will generally be carried out for examination of the general geological features and characteristics of a region.

- Geological Field Mapping

A geological field mapping will be conducted to obtain information about the surface lithologies and geological features and structures hence a geological map will be the outcome of this activity.

- Geophysical Survey

Information will need to be gathered from undiscovered hidden ore bodies below the surface. A field data will be obtained based on the principles and guidelines. A GPS will be used to record the data point locations, and no access roads will be constructed for this survey.

- RC/DC Drilling

Boreholes will be drilled at pre-determined sites on the proposed area. A 165mm diameter core drill will be used to drill the geological boreholes. At least twenty (20) boreholes will be drilled using a grid drilling pattern at a maximum depth of 200 m. The exact of respective borehole positions will heavily rely on the data received from geophysical survey. The spacing between boreholes shall be decreased appropriately where significant quality changes occur in structurally complex area and along the seam sub-outcrop.

- Concurrent Rehabilitation

After each borehole is completely drilled and does not show any occurrence, it will be fully rehabilitated. Rehabilitation will only be done by backfilling of material in their respective manner and closing the drilled hole with a cap.

Phase 2

- Core Logging

All drill holes will be logged every meter containing information such as hole location, depth and other geological structures encountered within the hole. Dust samples will be taken in sealed chip trays and safeguarded for future referencing. Portions of the drill chips representing the ore will be taken and placed in bags for analysis.

- Sample Analysis

All samples obtained from the drilling programme will be taken to the accredited laboratory for analysis and ore grade.

Phase 3

- Banking & Feasibility Studies

The outcome of the prospecting work will determine whether the project is viable or not. This phase will comprise of the following key aspects:

  - Geological Modelling
  - Mineral Resource Estimation

A mineral resource estimation will be conducted and compiled into a Mineral Resources and Reserves Statement to be signed by a competent person. The estimation will include the

tonnages and quality of the mineral. Should the results prove positive, the preparations for mining right application and any other relevant applications will commence. More various technical personnel will be involved in the process. The skills cycle will include geology, mine engineering, mine surveying, metallurgy, legal and finance.

Phase 4

- Rehabilitation and closure

Final rehabilitation of the site will be conducted as the final phase of the prospecting activities and will be undertaken upon cessation of the project

6. Policy and Legislative Context

Table 3: Policy and Legislative context

Applicable legislation and guidelines used to compile the report	Reference where applied
The Constitution of the Republic of South Africa, 1996 Under Section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) it is clearly stated that: Everyone has the right to a) an environment that is not harmful to their health or well-being; and 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.	Vahlengwe is undertaking an EIA process to identify and determine the potential impacts associated with the proposed prospecting activities. Mitigation measures recommended will aim to ensure that the potential impacts are managed to acceptable levels to support the rights as enshrined in the Constitution.
National Environmental Management Act, 1998 (Act No. 107 of 1998) and EIA Regulations (as amended in 2021) The Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) (as amended) was set in place in accordance with Section 24 of the Constitution. Certain environmental principles under NEMA must be adhered to, to inform decision making for issues affecting the environment. Section 24 (1)(a) and (b) of NEMA state that:	Activities associated with the proposed prospecting activities are identified as Listed Activities in the Listing Notice 1, GNR 983 (as amended), Listing Activity No. 20 and therefore require Basic Environmental Impact Assessment.

The potential impact on the environment and socio-economic conditions of activities that require authorization or permission by law, and which may significantly affect the environment, must be considered, investigated, and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity. The EIA Regulation, 2014 was published under GN R 326 on 07 April 2017 (EIA Regulations) and came into effect on 07 April 2017. Together with the EIA Regulations, the Minister also published GN R 327 (Listing Notice No. 1), GN 325 (Listing Notice No. 2) and GN R 324 (Listing Notice No. 3) in terms of Sections 24(2) and 24D of the NEMA, as amended.	The proposed prospecting project triggers activities listed in Listing Notice 1 of the NEMA, and a Basic Assessment process in terms of NEMA Government Notice Regulation (GNR) 982 (as amended) is required.
Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002) The Act makes provision for equitable access to and sustainable development of the nation's mineral and petroleum resources; and provides for matters connected therewith. Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002): Mineral and Petroleum Resource Development Regulations GNR 527 of 2004. Section 7 (1). The prospecting work programme must contain: - (f). a description of how the mineral resource and mineral description of the prospecting area will be determined throughout – (i) the prospecting work to be performed. (ii) a geological survey to be carried out; and (iii). A geophysical survey to be undertaken. (g). a description of the prospecting method or methods to be implemented that may include -(i) Any excavations, trenching, pitting, and drilling to be carried out.	The proposed project is applied for in terms of Section 16 of the MPRDA, 2002 (Act No. 28 of 2002) and the planned activities are according to the scope of the Prospecting Work Programme in terms of the Mineral and Petroleum Resource Development Act, 2002 (Act No. 28 of 2002): Mineral and Petroleum Resource Development Regulations GNR 527 of 2004.

(ii) Any bulk sampling and testing to be carried out; and (iii) Any other prospecting methods to be applied.	
National Environmental Management: Air Quality Act, 2004 (Act 39 Of 2004) The National Environmental Management: Air Quality Act, 2004 (No. 39 of 2004) (NEM: AQA) governs all aspects of air quality, including pollution prevention, national norms and standards, and the requirement for an Atmospheric Emissions Licence (AEL) for listed activities that emit pollutants into the atmosphere and have or may have a significant negative impact on the environment. Activities requiring an AEL are listed in GN No. 893 (22 November 2013), which was published in accordance with Section 21(1) (b) of the NEM: AQA. According to Section 22 of NEM: AQA, no one may engage in a listed activity without an AEL.	The prospecting operation will not be conducting activities that may require the application for an AEL. Regulation 2 of NEMAQA: National Dust Control Regulations GN R827 (01 November 2013) indicates that the purpose of the Act is to prescribe general measures for the control of dust in all areas. Therefore, Saqondisana will be required in terms of Regulation 6 and 7 of the Act to implement measures for controlling dust and conducting an Ambient Air Quality Monitoring PM_{10} respectively.
The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) is the main piece of legislation in South Africa that protects and regulates the management of heritage resources. The Act requires Heritage Resources Agencies, in this case in the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Authority of Gauteng (PHRA-G), to be notified of any developments that may exceed certain minimum thresholds as soon as possible.	A Heritage Impact Assessment study was conducted. Desktop research revealed that the project area would have been rich in Iron Age artefacts and the field survey noted that this is not the case within the proposed development site. The developer should therefore be aware of the potential for chance finds, remains and the applicant and contractors are urged to lookout for chance finds during prospecting.
National Environmental Management: Waste Act, 2008 The National Environmental Management: Waste Act of 2008 (No. 59 of 2008) (NEM: WA) governs all aspects of waste management, with a focus on waste avoidance and minimization. NEM: WA developed a system for categorizing and licensing waste management activities. Listed waste	The prospecting activities will not be generating waste that will trigger or require the application of the Waste

management activities that exceed certain thresholds are subject to an impact assessment and licensing process. Activities in Category A necessitate a Basic Assessment, whereas activities in Category B necessitate a Scoping and EIA process.	Management License in terms of the NEMWA. However, Saqondisana must ensure that the waste generated must be properly managed through a Waste Management Programme (WMP).
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) • The NEM:BA governs the management and conservation of South Africa's biodiversity within the framework established by NEMA. This Act also governs the protection of species and ecosystems that require national protection, as well as the management of invasive and alien species. The following regulations have been promulgated in accordance with the NEM:BA and are also relevant**:** Alien and Invasive Species Lists, 2014 published (GN R.599 in GG 37886 of 1 August 2014); National Environmental Management: Biodiversity Act, 2004: Threatened and Protected Species Regulations;	An Ecological Impact Assessment study was conducted for the proposed project. The study found that the area may no longer qualify as 'optimal' for the conservation of species. Once the development has been built this area will lose its qualification as CBA Optimal entirely due to fragmentation and the edge effect. However, this reduction and fragmentation of natural habitats, if mitigation measures as recommended are implemented
National Noise Control Regulations, R.154 of 1992 (the Noise Regulations) promulgated in terms of Section 25 of the Environmental Conservation Act, 1989 (Act 73 of 1989) The National Noise-Control Regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) (NCRs) form part of the Environmental Conservation Act and these Regulations apply to external noise. The NCRs differentiates between Disturbing Noise levels (which is objective and scientifically measurable which are generally compared to existing ambient noise level) and Noise Nuisance (which is a subjective measure and is defined as noise that "*disturbs or impairs or may disturb or impair the convenience or peace of any person*"). Local Authorities use Controlled Areas to identify areas with high noise levels. Restrictions have	The EMPr include measures to control and manage noise.

been set out for development that occurs in these Controlled Areas. These regulations make provision for guidelines pertaining to noise control and measurements. The regulations make reference to the use of the South African National Standards 10103:2008 (SANS) guidelines for the Measurement and <Rating of Environmental Noise with Respect to Land Use, Health, and Annoyance and to Speech Communication.	
Conservation of Agricultural Resources Act (Act No. 43 of 1983) The objects of this Act are to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants.	The EMPr include measures to control and manage potential impacts on the agricultural activities.
The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) is the main piece of legislation in South Africa that protects and regulates the management of heritage resources. The Act requires Heritage Resources Agencies, in this case in the South African Heritage Resources Agency (SAHRA) and the Provincial Heritage Resources Authority of Gauteng (PHRA-G), to be notified of any developments that may exceed certain minimum thresholds as soon as possible.	Desktop research revealed that the project area would have been rich in Iron Age artefacts and the field survey noted that this is not the case within the proposed development site. The developer should therefore be aware of the potential for chance finds, remains and the applicant and contractors are urged to lookout for chance finds during prospecting. The procedure for reporting chance finds has clearly been laid out and if this report is adopted by SAHRA/ KwaZulu-Natal Amafa and Research Institute, then there are no archaeological reasons why the proposed coal prospecting right application cannot be approved.

7. Need and desirability of the proposed activities.

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

The mining sector is very crucial to the South African economy. The success of the proposed prospecting activities and quantification of resources would lead to a potential viable economic mining activity. This will consequently boost the countries' current struggling economy, should the project advance to the mining phase. Mining will significantly contribute to local economic growth through direct job creation, future business opportunities, royalties, also contributing to the national gross domestic product and tax revenues.

It has been presumed that the proposed area may have reserves of Coal which is based on the available geological information. The prospecting project will be necessary to ascertain the data in relation to the nature, location, and extent of the ore within the proposed prospecting area. Prospecting will also determine whether there are any features that could affect the economic extraction of coal, should the project advance to the mining phase. Furthermore, if the target minerals are discovered, the information obtained from the prospecting activities will be required to determine how and where the coal body will be extracted, as well as how much economically coal reserves are available within the proposed prospecting area.

Saqondisana Investment anticipates that significant benefits from the area, should minerals be discovered, will accrue to the immediate area, the sub-region, and the Kwa-Zulu Natal Province. These benefits must be balanced against the costs of the area, including the impacts to the landowner. There is no reason why this proposed project should not be considered at this time, given the high likelihood of a reserve as demonstrated by other resources discoveries in the area.

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

- **Preferred site**

The proposed prospecting project site was selected as a preferred site based on the available geological information and historical data of the site. The available geological information suggests that the preferred site may have Coal reserves.

- **Activities**

The prospecting activities will be undertaken in 2-5 phases for a total duration month 13 – month 48, thus five (5) years. The intended activities within the stipulated timeframes will be able to provide sufficient information to declare the occurrence of the targeted mineral bodies. If the intended outcome of the project is not achieved within the intended timeframes, the prospecting right will be subjected to renewal by extending the period up to three (3) years as required in terms of Section 18 of the

MPRDA, 2002 (Act No. 28 of 2002) (as amended). The prospecting activities will include the following activities:

Vegetation clearance of an extent area of 30x30m will be undertaken for the establishment of the site camp offices and auxiliary equipment for the operation.

- **Installation of mobile offices and ablutions**.
- **Construction of temporal access roads** to the site camp and drill sites will be undertaken within the proposed area. However, existing farm roads will be utilized as far as practicable.
- **Drilling** of twenty (20) boreholes will be undertaken at a maximum depth of 50 m with each borehole sump area of 10m length x 10m breath; and
- **Rehabilitation** of the overall site and **closure**.
- **Technology alternative**

The layout plan of the infrastructure has been planned to avoid sensitive areas as far as possible. The intended method of vegetation clearance will have minimal environmental impacts. The applicant intends to utilise a bulldozer to clear vegetation for site establishment and the construction of the access roads. A 165mm diameter core drill will be used to drill the geological boreholes at pre-determined sites on the proposed area. There are no alternative technologies identified for the proposed prospecting activities in this regard.

9. 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.

9.1. Details of the development footprint alternatives considered.

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

Saqondisana intends to conduct the prospecting of Coal to determine whether the area contains these commodities and, if so, whether the mineral reserves are found in quantities that are economically valuable.

According to the NEMA: EIA Regulations GNR 982 (as amended), a Basic Assessment is required to identify alternatives for areas applied for, and in terms of the Regulations, an alternative to a proposed activity means a different strategy to meet the general purpose and requirements of the activity.

9.1.1. The property on which or location where the activity is proposed to be undertaken.

Prospecting sites and associated campsite location and access routes are among the location alternatives considered for the proposed area. The location alternatives were opted for based on

several criteria, including environmental considerations (how sensitive the area is in terms of soils, wetlands, groundwater, and so on), sensitive receptors (proximity to communities and farmsteads), and the area's dependence on the necessary infrastructure.

9.1.2. The type of activity to be undertaken.

Alternative drilling sites cannot be considered at this stage because exploration boreholes can only be sited after desktop assessment, field mapping, and geophysical survey have been completed. There were two alternatives considered which is constructing new roads or using existing roads and establishing tracks. The use of existing roads was preferred because of the impact on vegetation and potential erosion that the construction of new roads might have.

9.1.3. The design or layout of the activity;

Since this area will not require any complicated surface infrastructure, no design and layout alternatives for the proposed area were determined. Alternatives were considered for the location of the campsite. A static location near the entrance of the site, a mobile campsite, and an offsite campsite were among the alternatives. The alternative sites were determined based on the sensitivity of the proposed area.

9.1.4. The technology to be used in the activity.

The prospecting activities proposed in the Prospecting Works Programme is dependent on the preceding phase as previously discussed; therefore, no alternatives are indicated, but rather a phased approach of trusted prospecting techniques.

9.1.5. The operational aspects of the activity; and

- **Site Establishment**

Vegetation clearance and topsoil removal in some instances will be undertaken for the establishment of the drill sites.

- **Access Roads**

Existing roads will be utilized as far as possible, and areas of the least sensitivity will be chosen for access roads to the drill sites establishment.

- **Drilling**

Percussion drilling will be undertaken to determine the occurrence and distribution of the ore body. Drilling of the geological boreholes will be conducted at pre-determined sites on the proposed area.

9.1.6. The option of not implementing the activity.

The ‘No-Go’ alternative is the option to not conduct prospecting activities at the proposed project site.

The No-Go alternative assumes that the site would remain in its current condition. The No-Go alternative would have no impact on the social and biophysical environment.

Saqondisana intends on prospecting the proposed area to determine the availability of Coal Should the mineral be found; the proposed prospecting project alone will result in job creation and support for local businesses.

Accordingly, the consequences of not undertaking the proposed project will diminish the potential positive impacts of this project on the workforce to be used for the prospecting project as well as on the mining project. Therefore, the No-Go alternative is considered undesirable at the local and regional level.

9.2. 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 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.

- **Public Participation Materials**

Following the legislative requirements and good practice, it is important to develop documentation, which will be easily accessible to all stakeholders who would be affected or interested in the project. The following documents were developed and distributed to all stakeholders including the interested and affected parties. The various PPP materials which were used as part of the EIA processes are included as appendices to this report.

Background Information Document (BID):

The BID (**Appendix 3B**) aims to provide important information regarding the following:

- Project description of the proposed prospecting activities.
- The EIA and the PPP were undertaken in support of the Prospecting activities and relevant contact details.
- Details about how stakeholders could register as an Interested and Affected Party (I&AP) and be kept informed about the Project developments; and
- The public review and comment period for the draft Basic Assessment Report (BAR).
- The BIDs were hand delivered to the affected and surrounding landowners.

I&APs Registration Form:

A registration form was distributed to the community attached to the BID for the registration of the Interested and Affected Parties (I&AP).

Site notice:

An A3 sized site notices informing I&APs about the project information as per the published newspaper advert, were developed, laminated and erected at the boundary of the proposed site as required in terms of Section 24J of NEMA read with Regulation 41 EIA regulation notices were placed within the vicinity of the proposed project site at strategic locations where it was deemed to be visible to community.

Newspaper advertisements:

A newspaper advertisement, informing all I&APs residing in Ladysmith and the surrounding communities near the proposed area within the jurisdiction of the District Municipality of Estcourt was published and included the information about Saqondisana's intention to conduct the prospecting activities for Coal, in respect of Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT, Farm Emaweni 18034 GT and Farm Ravine 9201 GT within the Magisterial District of Estcourt, KwaZulu-Natal Province.The newspaper advert was published through **Ladysmith Gazette Newspaper dated 06th September 2024.**

I&APs were informed to register any comments or concerns that they might have regarding the proposed project by contacting EAP, via email through the provided comments request form or request additional information via the telephone. The EAP details were included in the advert, Background Information Document (BID) and site notice.

Public meeting:

A stakeholders engagement meeting was held at Emaweni ranch with the chief, village induna and his committee on the 19th of September 2024. The meeting was to facilitate discussions on the Draft Basic Assessment Report to obtain comments, issues, concerns, and inputs from the Interested and Affected Parties (I&APs). All comments raised were recorded in the Comments Response Report (CRR). The minutes of these meetings and presentations have been included in this report.

9.3. Summary of issues raised by I&APs

See attached Comments and Response Report attached as **Appendix 3D**

9.4. The Environmental attributes associated with the alternatives.

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

9.4.1. Baseline Environment

9.4.1.1. Type of environment affected by the proposed activity.

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

- **Regional Setting**

The proposed project area is located within the jurisdiction Uthukela District Municipality under the Alfred Duma and Inkosi Langalibalele Local Municipalities, Kwazulu-Natal Province. The proposed project area is located approximately 34km southeast of Umnambithi town and about 36 km the Estcourt town. The project area is accessible via the unnamed road that connects to the R74 Road in the southerly side.

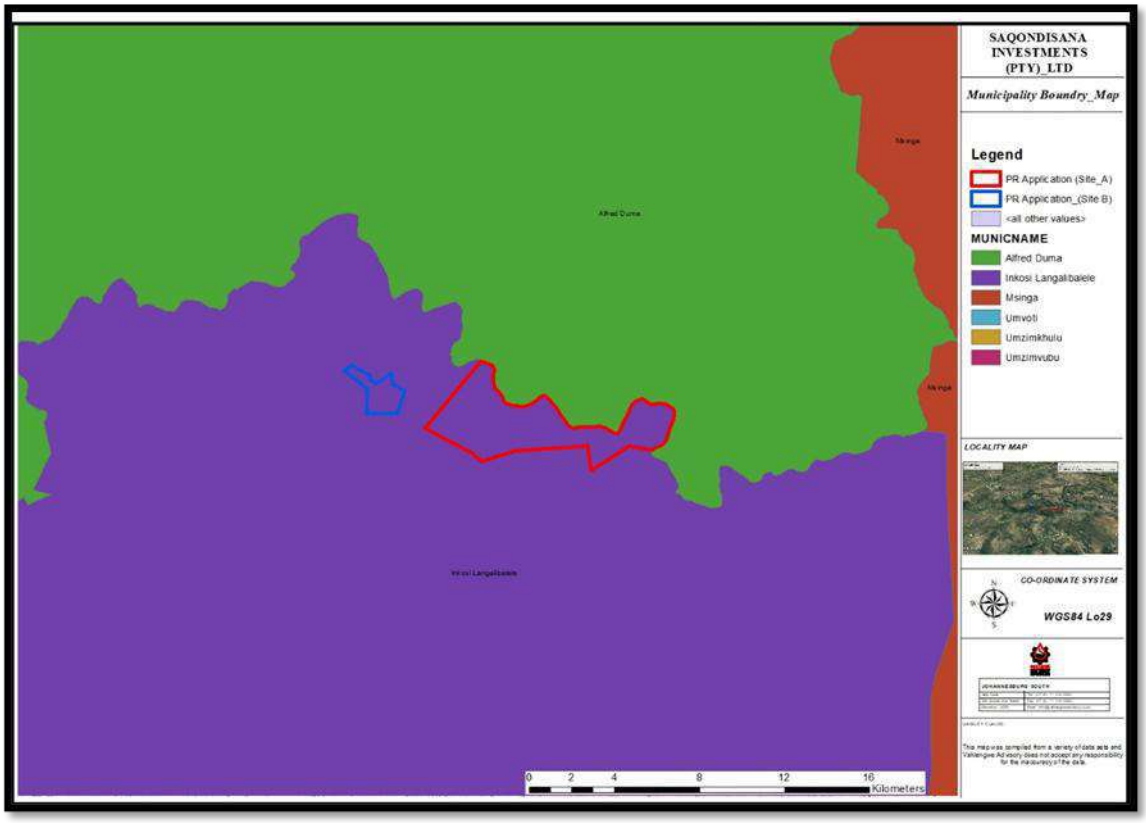


Figure 3: Municipal area

- **Climate**

The project area falls within the range of the Umnambithi (Ladysmith) weather station, which is in the southern hemisphere. The climatic conditions in Umnambithi are categorized as warm and temperate, with summers much rainier than winters. The climate is classified as Subtropical highland climate or Monsoon-influenced temperate oceanic climate (Cwb) by the Köppen-Geiger system (Köppen & Geiger, 1936). The average annual temperature is 17.3 °C whereas the annual precipitation is about 1057 mm. The town of Umnambithi is in the southern hemisphere, where summer begins towards the conclusion of January and ends in December. January is the warmest month of the year with an average temperature of 21.6 °C whereas July is the coldest month with an average minimum

temperature of 10.8 °C (see Figure 4). The month with the highest relative humidity is February (45.53 %) while the month with the lowest relative humidity is August (45.53 %). The month with the rainiest days is December (18.83 days) while the month with the least rainy days is July (2.47 days).

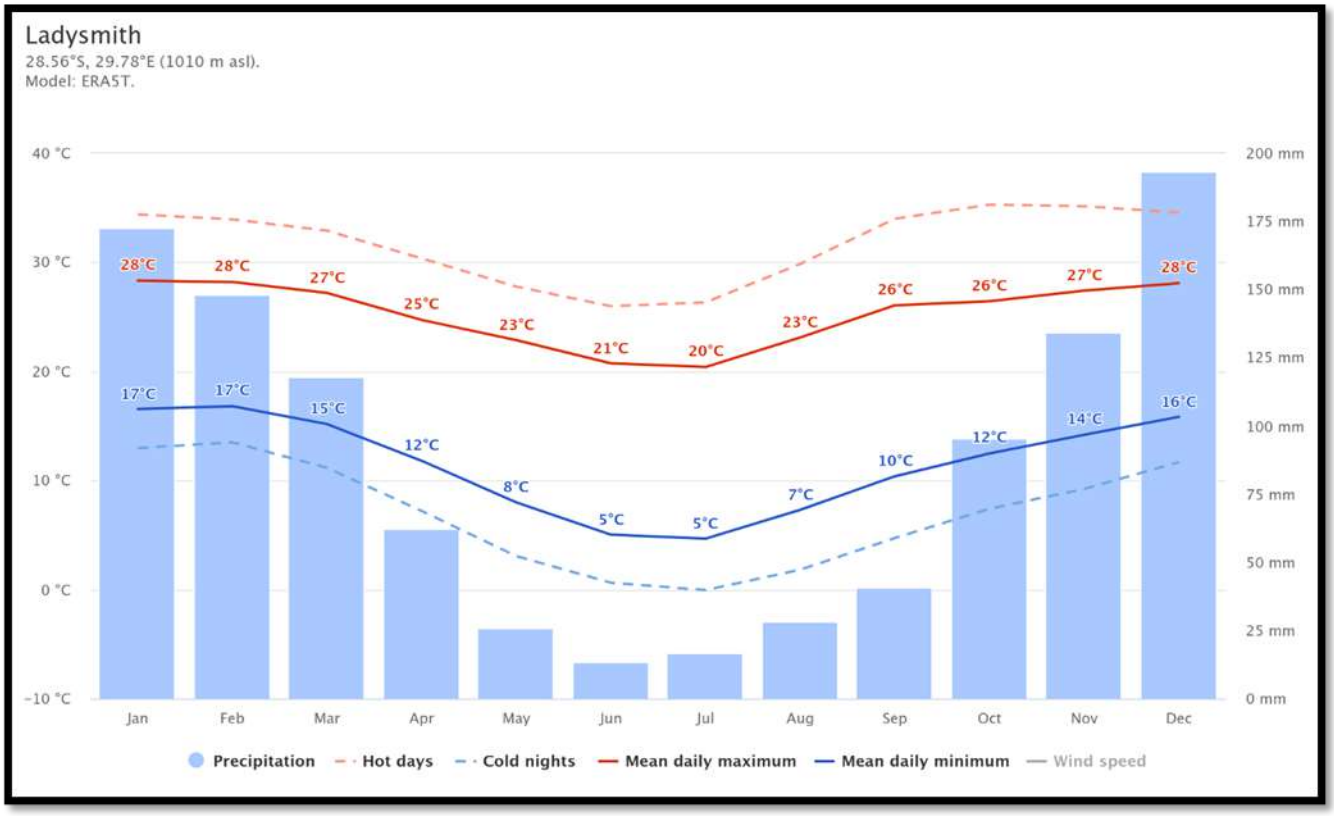


Figure 2: Average climate conditions for Ladysmith *(https://www.meteoblue.com)*

The occurrence of wind in Ladysmith is high, with the strong winds blowing constantly from December to April and calm winds from June to October. The strong winds blow from the Southern to the Northern direction as shown in the wind rose below. Both the frequency and velocity of these winds are highest in these directions.

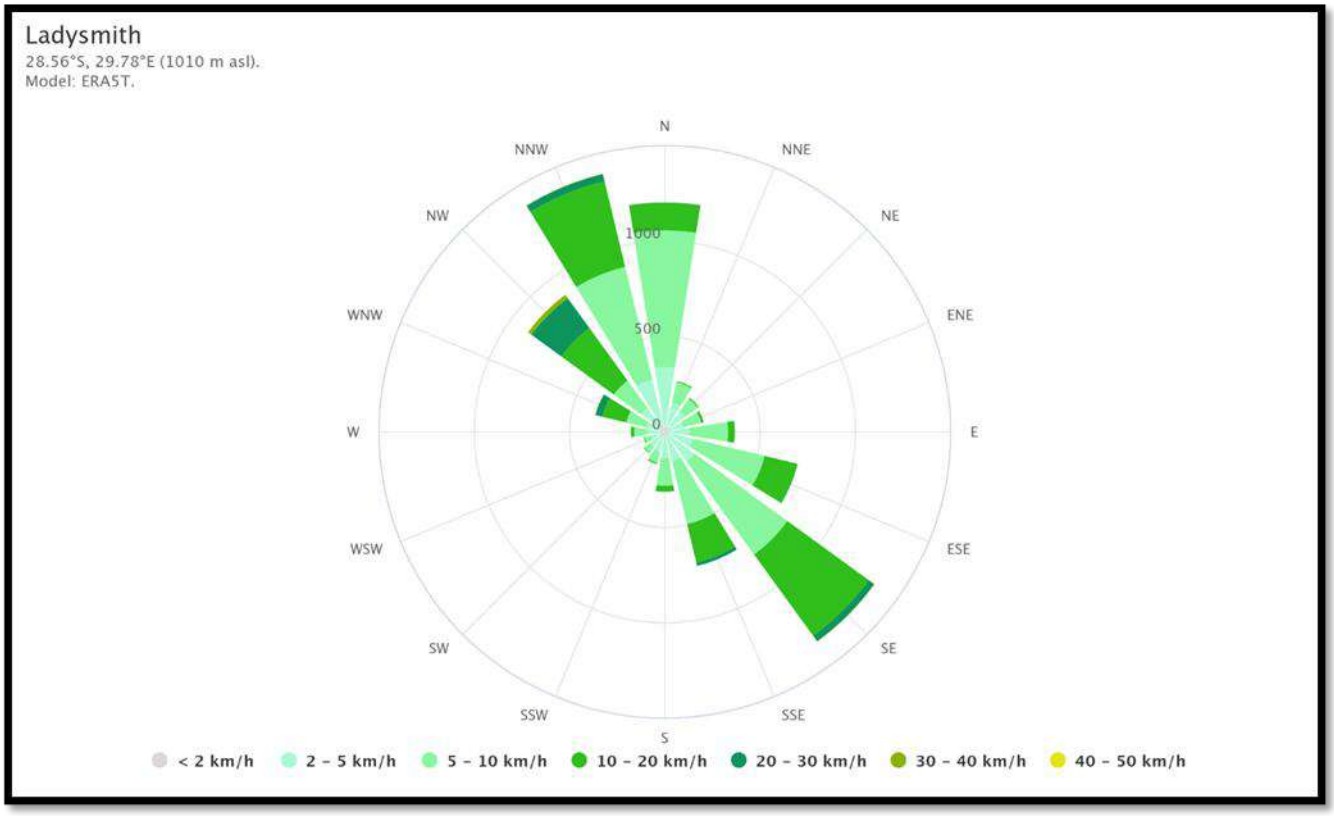


Figure 3: Wind Rose for Ladysmith *(https://www.meteoblue.com)*

- **Geology and Soils**

The proposed prospecting right area falls under the Vryheid Formation, and is part of the Ecca Group, which is one of the major subdivisions of the Karoo Supergroup (figure 6 below). The area typically features sandy soils. The Vryheid Formation is characterized by a variety of sedimentary rocks, including sandstones, siltstones, shales, and coal seams. The soils overlying this formation are diverse, reflecting the underlying lithology and the region's depositional history. Managing these soils for agriculture and mitigating the environmental impacts of mining are key considerations in the area.

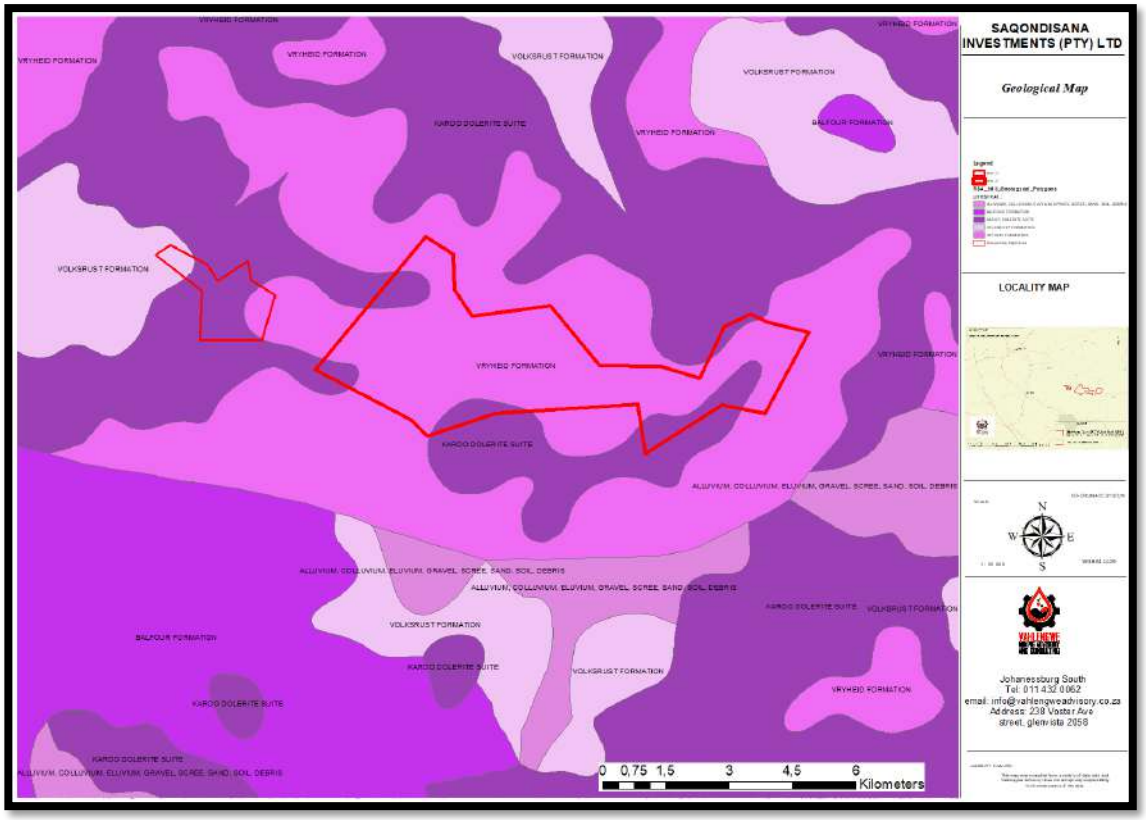


Figure 4: Geological map indicating the geological locality of the proposed prospecting area.

Topography and Land Capability

Umnambithi Town and its surrounding areas in both Alfred Duma and Inkosi Langalibalele Local Municipalities Local exhibit diverse topography and land capability. The region's rolling hills, fertile valleys, and river systems provide a mix of opportunities for agriculture, forestry, and urban development. Sustainable land management and conservation practices are essential to maximize the land's potential while protecting environmental resources. See the figure below

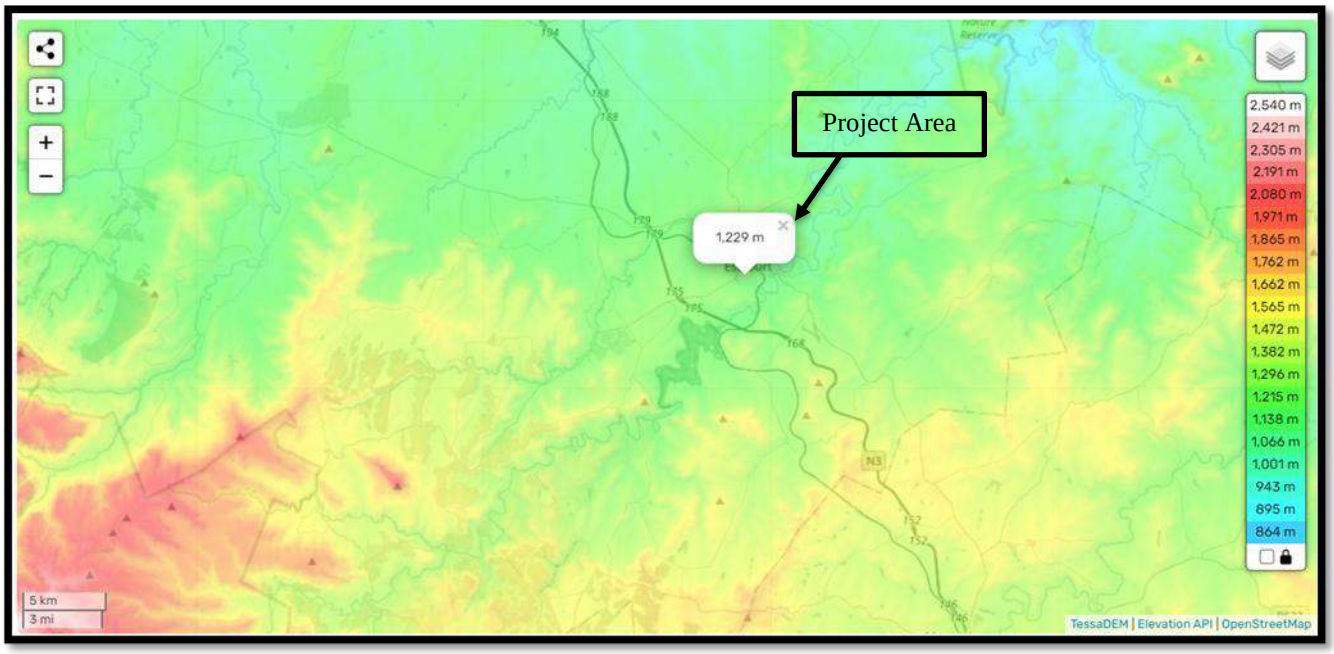


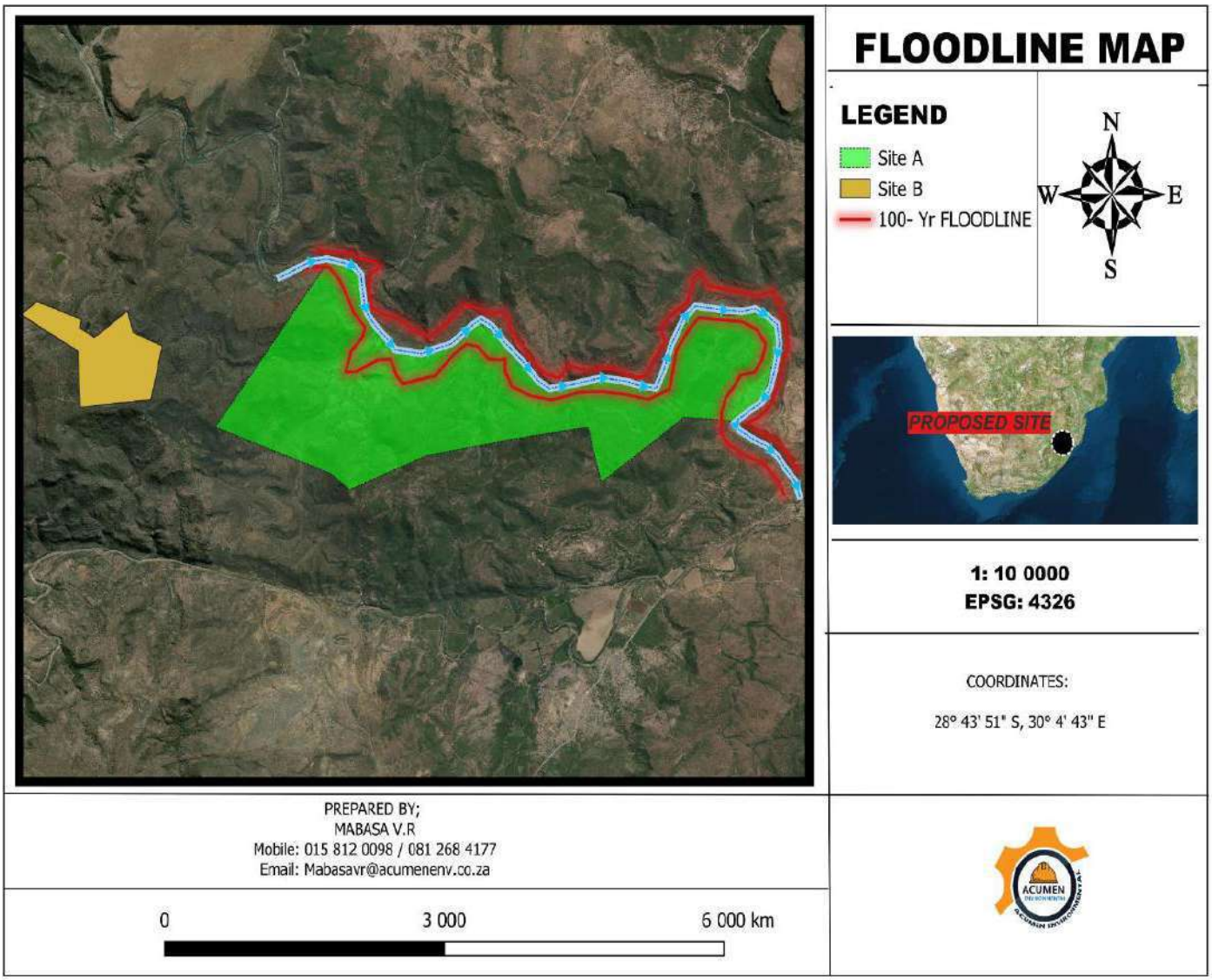
Figure 5: Topographical map of Umnambithi Town

- **Hydrology**

The hydrology of the uThukela District in KwaZulu-Natal is dominated by the uThukela River and its streams, with significant contributions from various dams and groundwater resources. These water systems are vital for agriculture, domestic use, industrial activities, and ecological health. Effective management of water resources, including flood control, water quality maintenance, and conservation of wetlands, is essential to sustain the district's hydrological health and support its diverse needs. The northeastern boundary of the proposed project is bordered by the Tugela River.

Naledzani Impact Assessment (Pty) Ltd conducted a wetland impact assessment to identify and assess the wetlands located within the proposed prospecting site to make recommendations for their appropriate management. According to the study, based on the current identification approach of the four wetland indicators, no wetland systems were identified or delineated within the study area but 2 bordering the site.

The Hydrological Impact Assessment study which was undertaken by Acumen Environmental (Pty) Ltd highlighted that the nearest river systems that could cause a potential 1: 100-Year flood do not encroach on the flood line on majority of the site except where “solid Red lines” are indicated, and development should be avoided in such areas. Development should proceed as intended.



Floodline Map

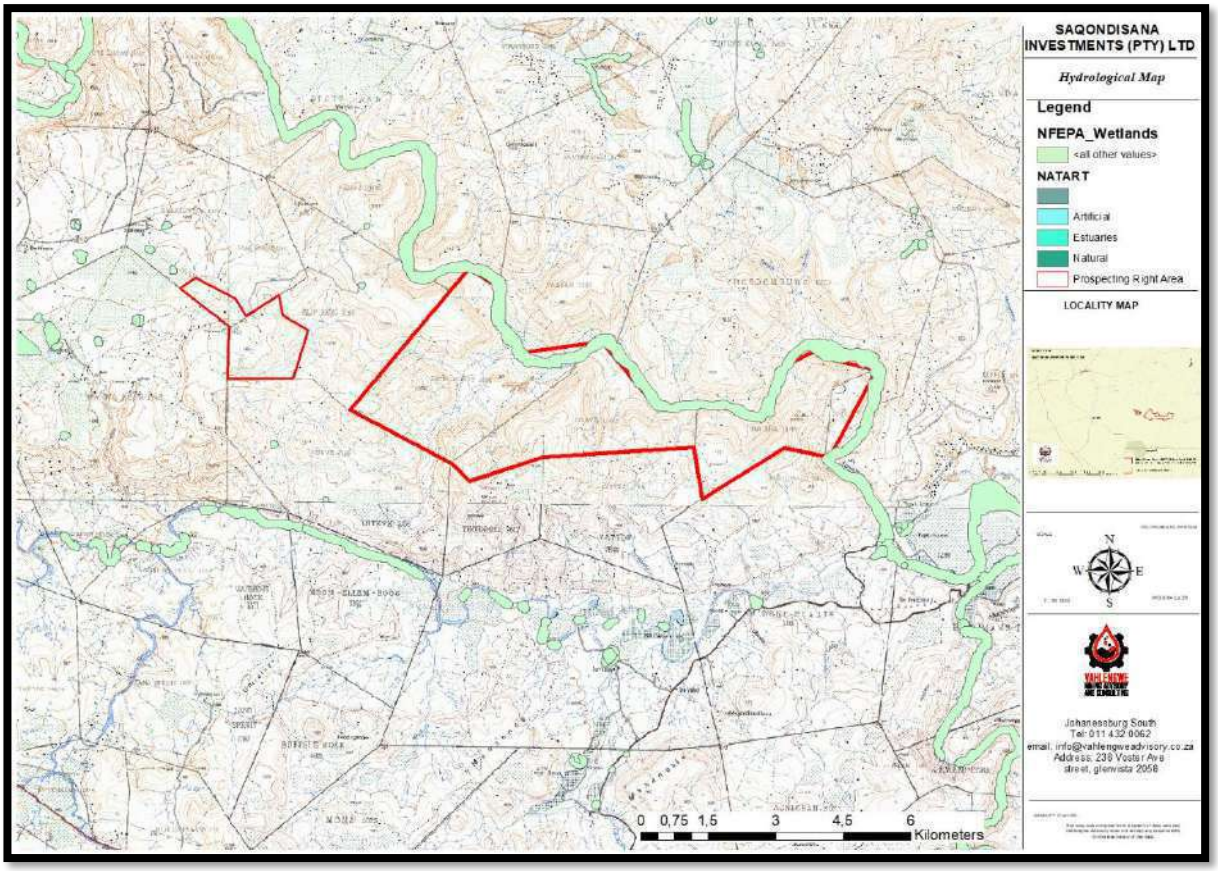


Figure 6: Hydrological Map

- **Biodiversity**
  - **Biomes**

The proposed project area is situated within the savannah Biome, the savannah biome is a distinct ecological zone characterized by a mix of open grasslands and scattered trees. This biome is prevalent in tropical and subtropical regions and is most associated with the expansive landscapes of Africa but can also be found in South America, India, and Australia. The savannah experiences warm temperatures throughout the year, typically ranging from 20°C to 30°C (68°F to 86°F). The savannah climate features a marked seasonal variation in precipitation, with a distinct wet season and a prolonged dry season. Annual rainfall ranges from about 500 to 1500 mm. The wet season lasts for approximately 6 to 8 months, providing the necessary moisture for grasses and other vegetation to thrive. The landscape is dominated by various species of grasses, such as elephant grass, Rhodes grass, and Bermuda grass, which can grow up to several meters tall. Trees in the savannah are typically drought-resistant and adapted to withstand fires. Common tree species include acacias, baobabs, and eucalyptus. These trees are widely spaced to reduce competition for water and sunlight. Many plants have developed deep root systems to access groundwater, thick bark to resist fires, and leaves that reduce water loss. The savannah supports a diverse array of large herbivores like zebras,

giraffes, elephants, antelopes, and wildebeests. These animals often migrate to follow the seasonal availability of water and fresh grazing grounds. Predatory animals such as lions, cheetahs, leopards, and hyenas are key components of the savannah ecosystem, maintaining the balance by preying on herbivores. Birds such as ostriches, secretary birds, and various raptors are common. Insects, particularly termites, play a crucial role in nutrient cycling and as a food source for other animals. Rivers, lakes, and seasonal waterholes are critical for the survival of savannah wildlife, especially during the dry season when surface water is scarce. Efforts to preserve savannah ecosystems include establishing protected areas, promoting sustainable land management practices, and restoring degraded lands. Conservation programs often focus on maintaining biodiversity, supporting local communities, and mitigating the effects of climate change. The savannah biome is a complex and dynamic environment that plays a crucial role in global biodiversity. Its unique combination of grasses and scattered trees supports a wide variety of life forms and ecological processes, making it an essential component of the Earth's natural heritage.

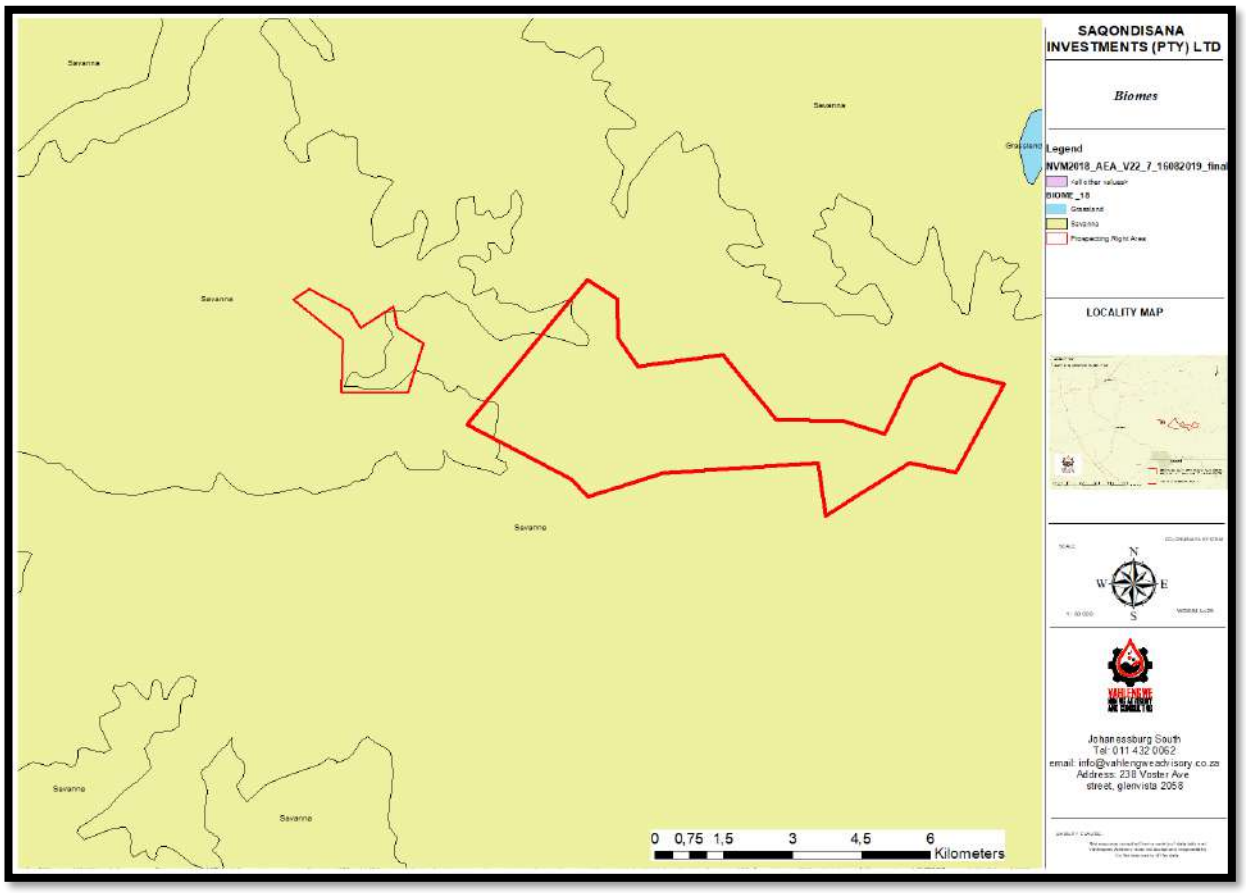


Figure 7: Biomes

- **Bioregions**

Estcourt Town falls within the sub-escarpment savannah bioregion. The Sub-Escarpment Savannah bioregion is a distinct ecological area characterized by a unique combination of geographic, climatic, and biological features. This bioregion is typically located in the transitional zone between the coastal plains and the escarpment slopes. It often encompasses the lower slopes and foothills of escarpments. It usually ranges from low to mid elevations, often below the main escarpment but above the coastal plains. The climate in this bioregion is typically tropical to subtropical. It experiences moderate to high rainfall, often with a distinct wet and dry season. The amount of rainfall can vary significantly depending on the proximity to the escarpment and the influence of orographic precipitation. Generally warm to hot, with temperatures moderated by elevation and proximity to the escarpment. The bioregion is often a hotspot for biodiversity due to its unique position and varied habitats. It provides essential ecological services such as water regulation, carbon storage, and soil fertility maintenance.

Figure 8: Bioregions

- **Vegetation Type**

The proposed prospecting area falls under Thukela valley bushveld. The Thukela Valley Bushveld is a specific vegetation type within the broader savannah and bushveld regions of South Africa, particularly associated with the Thukela River (formerly known as the Tugela River) in KwaZulu-Natal, typically found at lower to mid-elevations in the valley regions, often below 1,000 meters above sea level. The region experiences a subtropical climate with distinct wet and dry seasons. The area receives moderate rainfall, with most precipitation occurring during the summer months (November to March). Generally warm to hot, with high temperatures in the summer and mild winters. Characterized by bushveld, which is a type of savannah with a mixture of open grassland and dense thickets of shrubs and trees. Common tree species include Acacia (now Vachellia and Senegalia) species, such as Vachellia nilotica (Scented Thorn) and Vachellia tortilis (Umbrella Thorn). Other notable species include Aloe marlothii, Euphorbia ingens, and various Combretum species

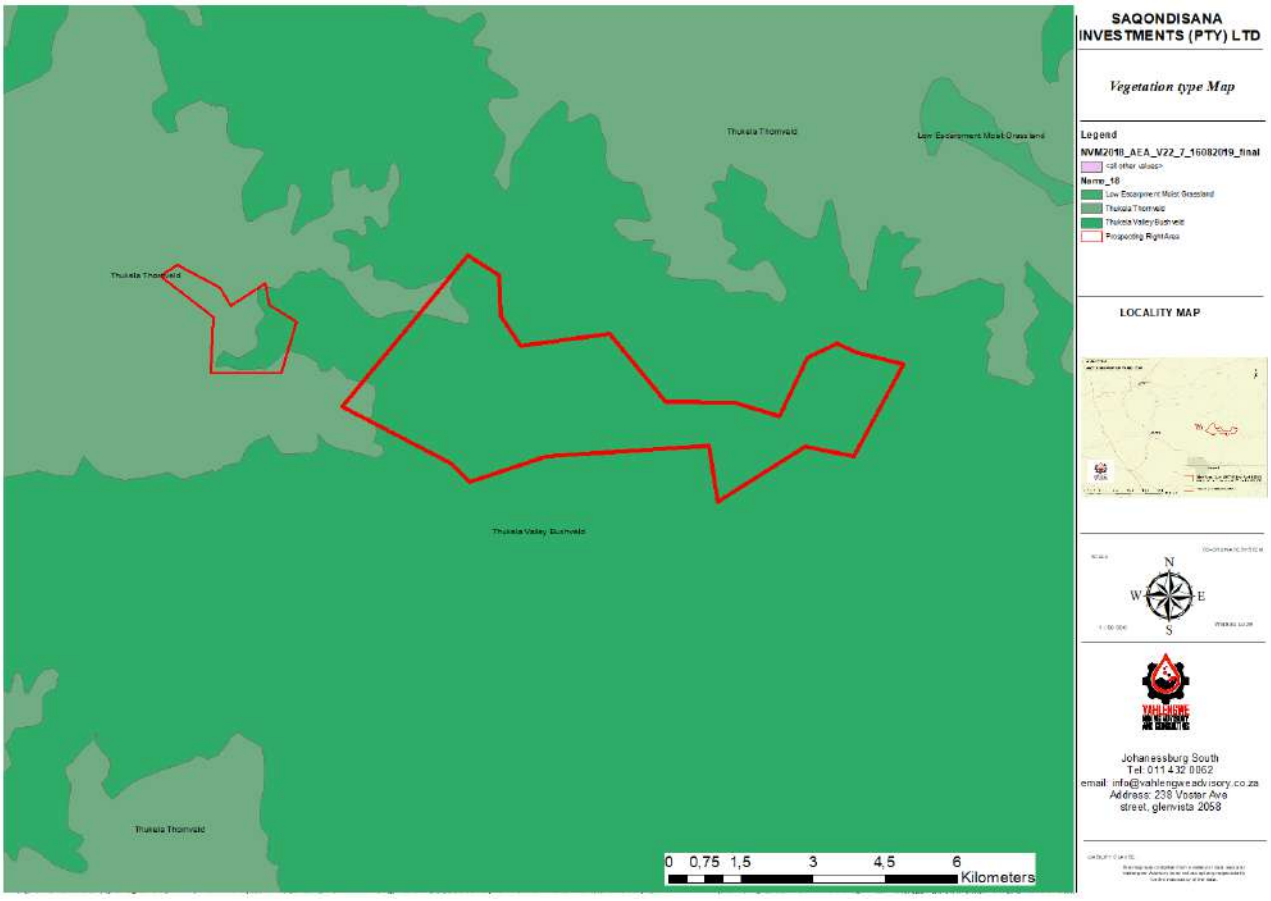


Figure 9: Vegetation type

- **Fauna**

The Thukela Valley Bushveld is rich in fauna, encompassing a diverse array of mammals, birds, reptiles, and insects adapted to its unique environment. Species such as impala (Aepyceros melampus), kudu (Tragelaphus strepsiceros), and bushbuck (Tragelaphus scriptus) are common. Phacochoerus africanus can often be seen grazing in open areas. Various species of hares, like the Cape hare (Lepus capensis), and small rodents. Includes species like the black-backed jackal (Canis mesomelas) and caracal (Caracal caracal). Mongooses, such as the slender mongoose (Galerella sanguinea), and the African civet (Civettictis civetta). Birds of prey such as the African fish eagle (Haliaeetus vocifer), martial eagle (Polemaetus bellicosus), and various hawks and kestrels. Species like the helmeted guineafowl (Numida meleagris) and the crested francolin (Dendroperdix sephaena). Includes species like the rainbow skink (Trachylepis margaritifera) and the giant plated lizard (Gerrhosaurus validus). Bees, wasps, and other pollinating insects crucial for the reproductive success of many plants. The Thukela Valley Bushveld's diverse fauna contributes to its ecological richness and plays vital roles in maintaining the balance of this unique ecosystem. Conservation efforts are essential to ensure the long-term survival of these species and the health of their habitats.

Table 9: Common mammal species that are known to exist in administrative district of Kuruman, including their preferred habitat.

Common mammal species	**Preferred habitat**
Impala	savanna and light woodland
Blesbok	open grasslands
Warthog	open savannas and grasslands
Bushbuck	dense bush and forested areas
Vervet Monkey	woodlands, savannas, and forested areas
Rock Hyrax	rocky outcrops and cliffs

- **Conservation Plan**

KwaZulu-Natal is a province renowned for its rich biodiversity, encompassing a variety of ecosystems from coastal regions and wetlands to grasslands and forests. The Critical Biodiversity Areas (CBAs) within KZN are regions identified for their high biodiversity value and are essential for maintaining ecological processes and conserving species. These areas are often prioritized for conservation actions to prevent biodiversity loss. KwaZulu-Natal vegetation type data shows that the proposed prospecting area falls within the least threatened area.

- **Socio-Economic Status**

Estcourt is a town in the uThukela District Municipality in KwaZulu-Natal, has a socio-economic profile that reflects both challenges and opportunities typical of many small towns in the region. This district faces a range of socio-economic challenges and opportunities that are reflective of its diverse landscape, which includes urban centres, rural areas, and significant natural attractions such as the Drakensberg Mountains. The district has a sizeable population, predominantly Zulu speaking, with a mix of urban and rural communities. uThukela District Municipality is characterized by significant challenges, including high unemployment, poverty, and disparities in access to services and opportunities. However, there are also opportunities for growth and development, particularly in agriculture, tourism, and community-driven initiatives. Efforts to improve education, healthcare, and infrastructure are ongoing, and addressing these challenges is critical for the sustainable development of the district.

- **Population profile**

Table 4: Population profile of Estcourt Town

Group	Percentage
Black African	68,8%
Coloured	4,4%
Indian/Asian	20,5%
White	5,3%
Other	1,0 %

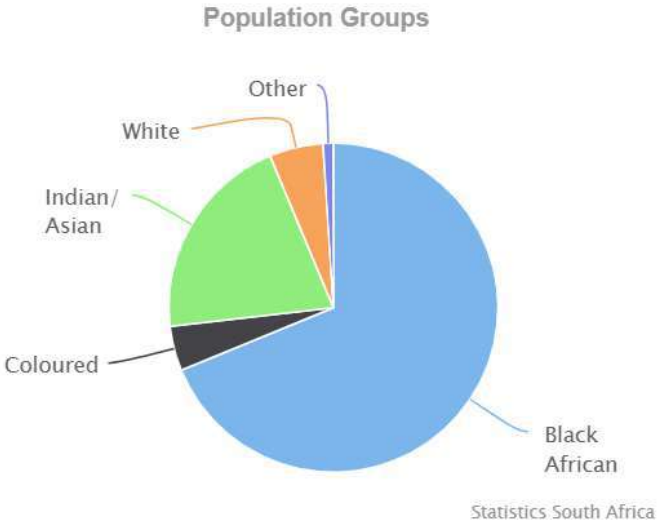


Figure 10: Population groups in Estcourt

(Source: Stats SA 2011 Census)

The Figure below depicts sex and age distribution for Alfred Duma local municipality derived from demographic breakdowns within Estcourt Town population. The population of Alfred Duma Local Municipality is relatively young, with a significant portion under the age of 20. There is also a slightly higher number of females compared to males. The working-age population constitutes the bulk of the population, which has implications for local economic development, employment, and social services.

Gender profile

The gender composition is slightly skewed towards the male. A conclusion can be drawn for Inkosi Langalibalele where both shares of migrated population and male population are lowest in the district. The figure below illustrates the information as captured above.

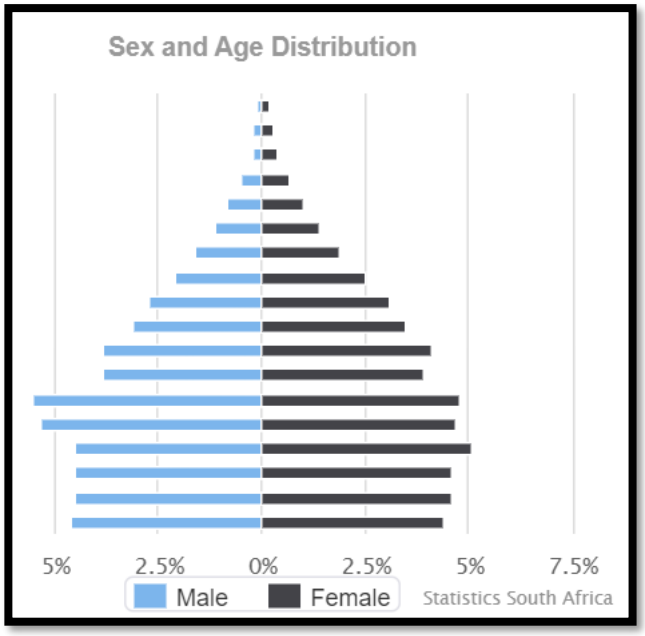


Figure 11: Sex and age Distribution of Estcourt Town *(Source: Stats SA 2011 Census)*

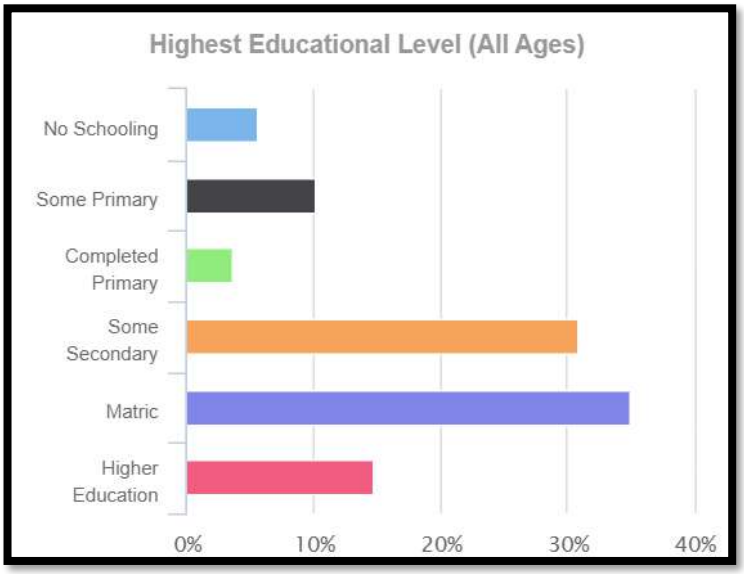


Figure 12: Education level of Estcourt *(Source: Stats SA 2011 Census)*

Between 2001 and 2011 there has been an increase in the number of households that have access to electricity, piped water and formal dwellings. The Figure below shows that majority of people in the municipality depend on the regional or local scheme water supply and the groundwater from boreholes.

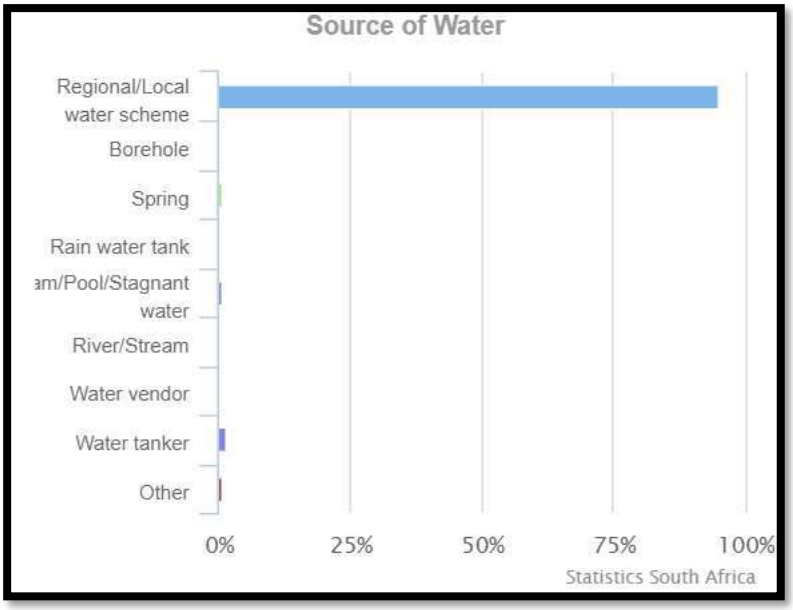


Figure 13: Sources of Water at Estcourt Town (Source: Stats SA 2011 Census)

The figure below shows the average household income in 2011. It shows that a greater number of people are earning in the R19601 to R38200 income category. This reflects inequality level which undermine efforts to address poverty levels in the municipality.

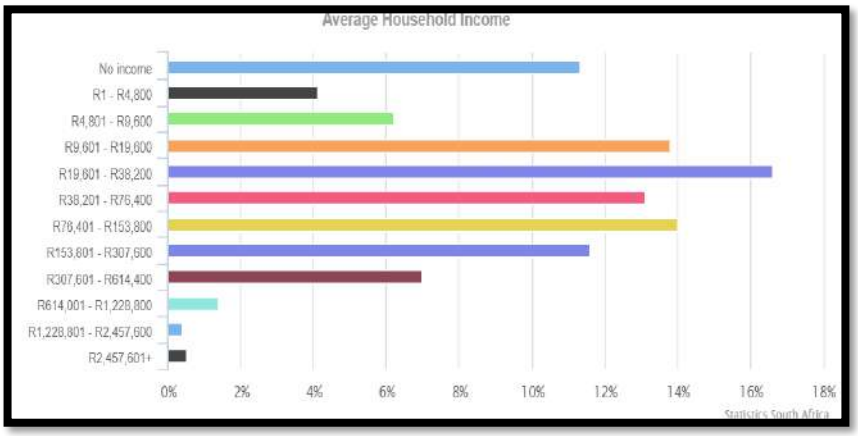


Figure 114: Estcourt Town Household Annual Income (Source: Stats SA 2011 Census)

9.4.1.2. Description of the current land uses.

uThukela District Municipality is characterized by its diverse landscape, rich cultural heritage, and socio-economic challenges, including high unemployment and poverty. Its economy relies heavily on agriculture and tourism, with some industrial and mining activities. Key minerals found in the district include coal, sandstone, sand and gravel, dolomite, and limestone, contributing to the local economy,

particularly in construction and infrastructure development. Development initiatives aim to improve living conditions, infrastructure, and economic opportunities for the residents.

The proposed project area is characterized by residential area and agricultural area. The project area is accessible via the unnamed road that connects to the R74 Road in the southerly side.

9.4.1.3. Description of specific environmental features and infrastructure on the site.

The area is an open veld with some environmental features and infrastructures on site. There are settlements within the site and several settlements occurring outside the proposed area boundaries. The northeastern boundary of the proposed project is bordered by the Tugela River There is a river

9.4.1.4. Environmental and current land use map

(Show all environmental, and current land use features).

The environmental and current land use of the proposed area is shown on the map below

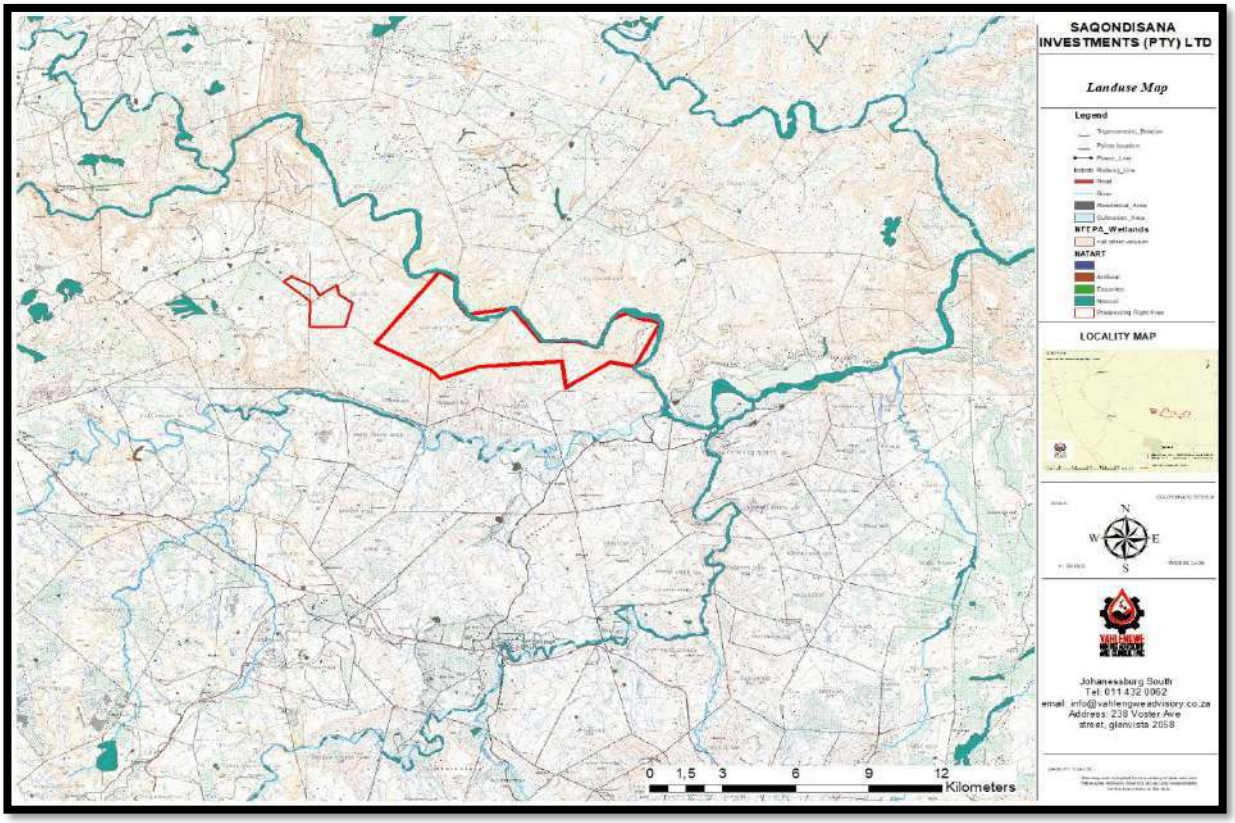


Figure 15: Environmental and Land use map

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

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance,

probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed, or mitigated).

Project activities

The prospecting activities will include the following activities:

- Establishment of the office and equipment storage site.
- Installation of mobile offices and ablution facilities;
- Construction of temporal access road to the camp;
- Drilling; and
- Rehabilitation and closure.

Impacts associated with the proposed project.

- Topsoil disturbance and soil erosion due to the vegetation clearance during the site establishment and drill sites establishment during the operational phase of the proposed project;
- Disturbance on the flora and fauna;
- Dust generation and noise disturbance due to the movement of the vehicles and operating equipment;
- Soil contamination and groundwater resources contamination due to the hydrocarbon spillages from the fuel storages and/or leakages from the operating vehicles;
- Impacts of socio-economic environments such as the farming and grazing lands; and
- Impacts on cultural, heritage and palaeontological resources

9.4.3. 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 to decide the extent to which the initial site layout needs revision).

Criteria to Consider when Determining Severity of impacts:

The ranking of impacts/determination of significance is estimated using two criteria, namely Consequence and Probability. These consider the contributing factors / criteria listed in the legislation. The definitions of each are provided below.

The **Consequence** of an impact resulting from an aspect is expressed as a combination of:

- **Nature** of impact: An indication of the extent of the damage (negative impacts) or benefit (positive impacts) the impact inflicts on natural, cultural, and/or social functions (environment).
- **Extent** of impact: A spatial indication of the area impacted (i.e., how far from activity the impact is realised).

- **Duration** of impact: A temporal indication of the how long the effects of the impact will persist, assuming the activity creating the impact ceases. For example, the impact of noise is short lived (impact ceases when activity ceases) whereas the impact of removing topsoil exists for a much longer period.
- **Frequency** of the impact occurring: An indication of how often an aspect, because of a particular activity, is likely to occur. Note that this does not assess how often the impact occurs. It applies only to the aspect. For example, driving takes place daily whilst other activities take place monthly while the resultant frequency of the impacts occurring will vary based on several factors.

Magnitude/Severity of an impact determines to what extent will the environment be destroyed or is functions be altered by the activity.

Significance of the impact is an indication of the importance of the impact in terms of both the physical extent and the time scale. It indicates the level of mitigation required.

Table 5: Environment impact assessment criteria.

CONSEQUENCE	**Nature of Impact:**		
	Low	Impacts affect the environment in such a way that natural, cultural. and / or social functions and processes are not affected.	**1**
	Low-Medium	Impacts affect the environment in such a way that natural, cultural. and / or social functions and processes are affected insignificantly.	**2**
	Medium	Impacts affect the environment in such a way that natural, cultural. and / or social functions and processes are altered.	**3**
	Medium-High	Impacts affect the environment in such a way that natural, cultural. and / or social functions and processes are severely altered. Impacts affect the environment in such a way that natural, cultural	**4**
	High	and / or social functions and processes will temporarily or permanently cease.	**5**
	Scale/Extent of Impact:		
	Local	The impacted area will only extend as far as the activity being conducted, e.g., the activity footprint	**1**
	Site	Impact occurs within a 20km radius of the site.	**2**
	Regional	Impact occurs within a 100km radius of the site.	**3**
	National	Impact occurs within South Africa.	**4**
	Duration of Impact:		
	Short-term	The impact will either disappear with mitigation or will be mitigated through the natural processes in shorter time span.	**1**
	Medium-term	The impact will last up to the end of the project phases, where after it will be negated. The impact will cease within 5 years if the activity is stopped.	**3**
	Long-term	The impact will last for the entire operational phase and after the operational life of the operation but will be mitigated by direct human action or by natural processes thereafter.	**4**
	Permanent	Intervention will not occur in such a way or in such a time span. that the impact can be considered transient.	**5**
	Frequency of the Occurrence of the Impact:		
	Annually or less	Impact occurs at least once in a year or less frequently.	**1**
	6 months	Impact occurs at least once in 6 months.	**2**
	Monthly	Impact occurs at least once a month.	**3**
	Weekly	Impact occurs at least once a week.	**4**
	Daily	Impact occurs daily.	**5**
PROBABILITY	**Probability of the Occurrence of the impact:**		
	Improbable	The possibility of the impact materializing is very low either. because of design or historic experience.	**1**
	Probable	The possibility of the impact materializing will occur to the extent that provision must be made thereof.	**2**
	Highly Probable	It is most	**4**
	Definite	The impact will occur regardless of any prevention measures.	**5**
	Magnitude of the impacts:		

	Low	The impact alters the affected environment in such a way that the natural processes are not affected.	**2**
	Medium	The affected environment is altered; however, the functions and processes continue in a modified way.	**6**
	High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.	**8**
SIGNIFICANCE	**Significance of the impact: Sum (Duration, Extent, Duration) x Probability**		
	Negligible	The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.	**< 20**
	Low	The impact is limited in extent, with low to medium intensity and whatever the probability of the occurrence may be, the impact will not have a material effect on the decision and is likely to require the management intervention with increased costs.	**< 40**
	Moderate	The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.	**< 60**
	High	The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation	**> 60**

This rating system is weighted in such a way as to set impacts that are very likely to occur, but have very little consequence, as negligible significance. Similarly, impacts with serious consequences but that are unlikely to occur are rated lower, than impacts with serious consequences that are likely to occur.

Table 6: Impacts and risks identified.

Element	Impacts	Mitigation	Post-mitigation					
			Extent	Duration	Probability	Significance	Reversibility	Replaceability
Soils and Land Capability	Soil compaction, erosion and contamination which may disrupt the land purposes for the current land use	• Rehabilitate each site as soon as the drilling is completed. • Conducting preventative soil erosion control measures.	Site	Short-term	Possible	Low	Reversible	Replaceable
Vegetation	Loss of vegetation cover due to clearance during the site preparation. Vehicle movement and compaction of soil minimising plant growth of indigenous flora. Alteration of natural environment and habitat loss. Spreading of invasive alien plants. The altered environment will also favour species that are better adapted to disturbed/transformed areas. Exposed disturbed area with no indigenous vegetation. Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important habitats.	• Environmental awareness and training to the contractors. • Drillers to comply with all EMPr procedures. • Drilling sites to be in less sensitive areas as far as possible. • Rehabilitate the disturbed areas as far as possible. • Vehicles should only use designated roadways to access the site. • Have a biodiversity protocol and rehabilitation plan in place that will be implemented upon closure. • Invasive plant material should be disposed by incineration, or alternatively, composting to break down seeds. If seedbank persists, invasive alien plant management and eradication measures should be implemented. • Implement effective rehabilitation measures upon closure. • No fires to be made in the prospecting area.	Site	Short-term	Possible	Low	Reversible	Replaceable

Animal life	Loss of priority fauna species from important habitats. Loss of resident fauna through increased disturbance. Displacement of resident fauna species through increased disturbance.	• Implementing noise monitoring measures and management. • If any animals are encountered, they must not be killed or injured but should rather be removed or chased away from the site. • Avoid vegetation clearance during the breeding season.	Site	Short-term	Possible	Low	Reversible	Irreplaceable
Surface Water	Surface water resources contamination due to hydrocarbons spills, siltation, and disruption to natural drainage systems	• Conducting concurrent rehabilitation • Immediate cleaning after every hydrocarbon spill with a safe disposal method. • Implementing measures to prevent hydrocarbons spills. • Conducting prospecting activities in safe buffer zones (30m) from the water resources.	Local	Medium-term	Probable	Moderate	Irreversible	Replaceable
Ground water	Changes in runoff and infiltration during the operation phase leading to reduce groundwater recharge. Groundwater contamination from fuel & hydrocarbons leakages and spillages from the storage and transporting vehicles. Baseflow reduction caused by proposed activity.	• Implementing measures to minimise the removal of vegetation and opportunities for revegetation will be maximised. • Implement groundwater monitoring to detect groundwater contamination. • Implementation of the mitigation measures to minimise hydrocarbon spills. • Conducting prospecting activities in low groundwater sensitivity area.	Site	Short-term	Probable	Low	Irreversible	Replaceable
Air Quality/ Dust	Dust generation by vehicle movement on dust roads and during drilling operations.	• Implement management measures to minimise the generation of dust such as dust suppression. • Ensure compliance to speed limits.	Site	Short-term	Highly Probable	Low	Irreversible	Replaceable

Noise	Noise nuisance will be created by the drilling rig, operating equipment, and vehicle movement.	• Ensure vehicles and equipment is maintained. • Silencers should be fitted on all engines.	Site	Short-term	Probable	Low	Irreversible	Replaceable
Cultural Heritage	Destruction of archaeological remains. Disturbance of graves. Disturbance of buildings and structures older than 60 years old. Destruction public monuments and plaques.	• Use chance find procedure to cater for accidental finds. • Maintaining a 100m buffer from all identified 'no-go' areas with heritage resources. • Encountered heritage resources, including fossils, graves, or human remains must be reported to the relevant authorities.	Site	Short-term	Improbable	Low	Reversible	Replaceable
Visual	Visual disturbance of the movement of drilling equipment and other vehicles.	• Rehabilitate drill sites and access tracks.	Site	Short-term	Probable	Low	Reversible	Irreplaceable
Socio-economic	Disruption to the economic agricultural practices.	• Practice concurrent rehabilitation to minimise the time and financial resources to rehabilitate the area to return to its continuous economic practices.	Site	Short-term	Probable	Low	Irreversible	Replaceable
Safety	Equipment theft and property vandalism	• controlled access to the site by deploying security personnel who would also conduct security patrols to monitor the perimeters of the project site. • All project infrastructure should be contained in a safe and secured area.	Local	Short-term	Probable	Low	Reversible	Replaceable
Health	Health impact due to dust inhalation, occupational injuries.	• Implementation of the dust generation mitigation measures and dust monitoring measures • Issue with instructions to wear the appropriated personal protective equipment (PPE) to the working personnel.	Local	Medium term	Probable	Moderate	Reversible	Replaceable

		• Place safety signs and put barricades where there's possible danger to health and safety of the community.						
Waste Generation	Waste nuisance and littering	• Ensure implementation of the waste management programme with the application of waste classification and separation. • Proper waste collection and disposal. • Conduct environmental awareness training.	Site	Short Term	Probable	Low	Reversible	Replaceable
Traffic and access	Prospecting activities will generate very limited additional traffic. Prospecting vehicles are to access the property via existing roads and tracks only.	• Comply with traffic regulations. • Ensure compliance to speed limits.	Site	Short Term	Probable	Low	Reversible	Replaceable

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

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

The impacts assessed has highlighted potential risks, important management strategies and control measures associated with the Project. It is considered there are opportunities to substantially enhance and improve the current and on-going impacts by undertaking a well-planned and effective prospecting operation. The project has associated positive and negative impacts, and such impacts are described in the table below:

Table 7: Positive and Negative impacts

Aspect	Description
Positive	
Soils and Land Capability	Potential for neighbouring communities to benefit from assistance with shared land management responsibilities.
Animal Life	The opportunity of implementing processes around feral animal control.
Socio-economic	• Opportunities for indigenous employment and economic development. • Requirement for the supply of the goods and services from the local businesses; and • Requirement for short-term accommodation and thus benefiting the house rental and accommodation sector.
Waste	• Supporting local recycling centre and local scrap metal merchant; and • Metals such as steel and copper wire will be collected in designated areas prior to removal from site for recycling.
Negative	
Soils and Land Capability	• Landscape disturbance. • Soil compaction and soil erosion due to the movement of heavy vehicles in the on-site; and • Soil contamination due to hydrocarbon spillages from the fuel storages and vehicles.
Flora and Fauna	Introduction of alien vegetation; and Loss of flora and fauna and habitat destruction
Surface water resources	Erosion and sedimentation leading to soil scouring and increased turbidity of water courses and drainage lines downstream.
Groundwater resources	Contamination of groundwater due to chemicals and hydrocarbons seepage
Noise	Noise nuisance due to moving vehicles and equipment
Air Quality/Dust	Dust creation during clearance, placement of infrastructure and the drilling operations
Visual	Increased visual intrusion due to operation infrastructure and the movement of the operating equipment and vehicles
Socio-economic	Project is unsustainable in terms of job security due to the life of project
Cultural and Heritage Resources	Indigenous resources, values, and aspirational impacts
Waste	Waste generation including the domestic, scrap and hazardous waste
Health and Safety	Inheritance of occupational health problems and exposure to occupational hazards
Traffic and Access	Addition to the existing traffic of the movement of vehicles

Table 8: Positive and negative impacts of the proposed activity.

Impact	Rating Pre-Mitigation	Construction	Operation	Decommission	Rating post-mitigation
Positive (+)	**Low**	Job creation	• Employment opportunities and job security • Support to local businesses • Income generation for accommodation business sector • Supporting local recycling centre and local scrap metal merchant	• Employment opportunities	**Low**
Negative (-)	**Low**	• Visual nuisance • Health and Safety impacts • Surface and groundwater contamination • Impacts on traffic. • Disturbance on the landscape • Waste generation	• Visual nuisance • Health and Safety impacts • Surface and groundwater contamination • Impacts on traffic. • Unsustainable job security • Disturbance on the landscape • Waste generation	• Visual nuisance • Health and Safety impacts • Surface and groundwater contamination • Impacts on traffic. • Job losses	**Low**
Negative (-)	**Medium**	• Habitat disturbance • Vegetation disturbances • Loss of biodiversity • Soil erosion • Soils contamination • Visual nuisance to moving equipment and vehicles. • Noise disturbances	• Habitat disturbance • Vegetation disturbances • Loss of biodiversity • Alien vegetation species invasion • Soil erosion • Impacts on groundwater quality. • Soils contamination • Visual nuisance due to moving equipment and vehicles. • Noise disturbances	• Habitat disturbance • Vegetation disturbances due to vegetation clearance • Alien vegetation species invasion • Soil erosion • Impacts on groundwater quality. • Waste generation • Visual nuisance due to moving equipment and vehicles	**Medium**

9.4.5. 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).

All possible mitigation measures that could be applied to risks regarding the site layout are discussed and considered as part of the EIA process. This has also taken into consideration the comments received from I&APs during the public participation process. The proposed mitigation measures for the assumed risks are outlined on Section 10 of this report.

9.4.6. Motivation where no alternative sites were considered.

The prospecting activities are intended to be conducted in search of the coal deposits. These minerals occur in specific areas depending on the geology of the area. The historical data shows that there could be the occurrence of coal in the area, and therefore, the prospecting activities are ought to be undertaken in the proposed site. The proposed site has existing access roads that will be used during the operational phase of the project and minimal infrastructure will be established due the site location.

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

Based on the different studies conducted, it has been concluded that all invasive prospecting activities will not be undertaken in sensitive areas wherein considerate buffer zones (100m) will be created from all identified environmental sensitive and ‘no-go’ area.

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

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

Environmental Impact Assessment (EIA):

Environmental impacts can have both negative and positive consequences for the environment and its inhabitants. These effects can have an impact on the air, land, water, fish, wildlife, or the entire ecosystem. Environmental impact assessment is a method of assessing the environmental consequences and potential negative effects of changes.

Humans' activities have a wide range of effects on the physical environment, including overpopulation, pollution, the use of fossil fuels, and deforestation. These types of changes have resulted in climate change, soil erosion, poor air quality, and undrinkable water. These negative consequences can influence human behaviour and lead to mass migrations or battles over clean water.

The purpose of the EIA Phase is to investigate the potential negative and positive impacts of a proposed project activities on the environment. The potential impacts will then be quantified to assess the significance that an impact may pose on the receiving environment. The objectives of the EIA process are to:

- Ensure that the potential biophysical and socio-economic impacts of the proposed project, are taken into consideration during the decision-making process.
- Ensure that the project activities to be undertaken do not have a substantial detrimental impact on the environment by presenting management and mitigation measures that will avoid and/or reduce those impacts.
- Ensure that I&APs are informed, including the landowner, about the proposed Project and the public participation process is properly followed.
- Ensure that I&APs are given an opportunity to raise concerns, and make input to understand their needs and expectations; and
- Provide a process aimed at enabling authorities to make an informed decision, especially in respect of their obligation to take environmental and social considerations into account when making those decisions.

The EIA process will assess the overall aspects affected by the proposed project in relation to the activities to be conducted. A sensitivity report has been conducted to determine the sensitivity of the proposed area to make sound decision on the consideration and implementation of the mitigation measures of the impacts posed by the proposed activity.

Using the significance criteria, impacts can be assigned a rating of a potential risk, uncertain risk, and significant risk.

- **Extreme**

These are unacceptable risks that are primarily critical in nature in terms of the extent and long-term environmental harm, permanent sacred site damage, fatality, and massive economic impacts that are effectively regarded as a possibility to almost certain to occur. Such risks significantly exceed the risk acceptance threshold and necessitate comprehensive control measures as well as additional urgent and immediate attention to the identification and implementation of risk-reduction measures.

- **High**

Typically refer to significant to critical consequences, such as significant environmental or heritage damage, as well as significant safety, social, or economic consequences that are likely to cut across the possible to almost certain likelihood ratings. These are also likely to exceed the risk acceptance threshold, and while proactive control measures have been planned or implemented, a very close monitoring regime and additional actions to reduce risk are required.

- **Medium**

As the classification suggests, medium level risks encompass a range of risk combinations ranging from relatively low consequence / high likelihood to mid-level consequence / low likelihood scenarios across environmental, social, and economic domains. Because they are effectively positioned on the risk acceptance threshold, these risks are likely to necessitate active monitoring.

- **Low**

These risks are below the risk acceptance threshold and although they may require additional monitoring in certain cases are not considered to require active management. In general, such risks represent relatively low likelihood and low to mid-level consequence scenarios.

- **Very Low**

Impacts risks that are below the risk acceptance threshold and would at the most require additional monitoring and in many cases would not require active management. These risks can include unlikely to rare events with minor consequences and in essence relate to situations around very low probabilities of relatively minor impacts occurring.

The probability of occurrence has been categorised within the context of reasonable timeframes and frequencies given the nature of the anticipated project life. The following table defines the levels of likelihood and severity for the types of consequences that comprise the risk rating determination:

Table 9: Likelihood rating system

Rating	Likelihood	Definitions
5	Almost certain	The event is expected to occur in most circumstances (The event is likely to occur once per year).
4	Likely	The event will probably occur in most circumstances (The event is likely to occur once every 1 – 2 years).
3	Possible	The event might occur at some time (The event is likely to occur once every 2 – 5 years).
2	Unlikely	The event could occur at some time (The event is likely to occur once every 5 – 10 years).
1	Rare	The event may occur only in exceptional circumstances (The event is unlikely to occur in any 10-year period).

Risk Analysis Matrix

The risk controls are linked to the level of risk and the opportunity for risk reduction to meet the project rehabilitation objectives and goals, which are linked to an environmentally and socially responsible operation, and these requirements are part of the regulatory obligations and impact assessment guidelines. The table below summarizes the qualitative risk matrix used, as well as the risk levels for the various consequence and likelihood combinations.

Table 10: Risk Analysis Matrix

Likelihood of Consequence	Severity of Consequence				
	Critical (5)	Major (4)	Significant (3)	Moderate (2)	Minor (1)
Almost Certain (5)	Extreme	Extreme	High	High	Medium
Likely (4)	Extreme	High	High	Medium	Medium
Possible (3)	Extreme	High	Medium	Medium	Low
Unlikely (2)	High	Medium	Medium	Low	Very Low
Rare (1)	Medium	Medium	Low	Low	Very Low

The impact assessment will focus on the invasive activities of the project since they will have the potential to impact on the biophysical and the social environment of the proposed area. These activities include:

- Vegetation clearance for site (camp and drill sites) establishment.
- Installation of mobile offices and ablutions.
- Construction of temporal access roads to the site camp and drill sites.
- Drilling; and
- Rehabilitation of the overall site and closure.

The impact assessment is furthermore separated into three distinct phases, namely:

- Site establishment/construction phase.

The site establishment will include the clearance of vegetation to establish the camp and drill sites. Various aspects of the environment will be subjected to the disturbances due to this activity.

- Operational phase; and

The operational phase will include the drilling operation whereby the drill cores will be logged and taken to the lab for analysis.

- Decommissioning.

This phase will entail the removal of all temporal infrastructure and the rehabilitation of all the disturbed area at the prospecting site.

Table 11: Identified and assessed impacts and risks the activity will impose on the preferred site.

Aspect	Impact	Mitigation Measures	*C	*L	*R
Vegetation	• Loss of vegetation cover due to clearance during the site preparation. • Vehicle movement and compaction of soil minimising plant growth of indigenous flora. • Alteration of natural environment and habitat loss. • Spreading of invasive alien plants. The altered environment will also favour species that are better adapted to disturbed/transformed areas. • Exposed disturbed area with no indigenous vegetation. • Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important habitats. • Loss of vegetation cover due to clearance during the site preparation. • Vehicle movement and compaction of soil minimising plant growth of • indigenous flora. • Alteration of natural environment and habitat loss. • Spreading of invasive alien plants. The altered environment will also favour species that are better adapted to disturbed/transformed areas. • Exposed disturbed area with no indigenous vegetation. • Long-term or permanent degradation and modification of the receiving environment resulting to the loss of important habitats.	• Environmental awareness and training to the contractors. • Drilling sites to be located in less sensitive areas as far as possible. • Rehabilitate the disturbed areas as far as possible. • Vehicles should only use designated roadways to access the site. • Have a biodiversity protocol and rehabilitation plan in place that will be implemented upon closure. • Invasive plant material should be disposed by incineration, or alternatively, composting to break down seeds. If seedbank persists, invasive alien plant management and eradication measures should be implemented. • Implement effective rehabilitation measures upon closure.	Pre – Mitigation		
			2	3	M
			Post – Mitigation		
			1	3	L
Animal Life	• Loss of priority fauna species from important habitats.		Pre – Mitigation		

	• Loss of resident fauna through increased disturbance. • Displacement of resident fauna species through increased disturbance.	• Environmental awareness and training for workers about the animal life on site. • Killing of animals on site will be strictly prohibited and animal found on site must be safely removed from the operation. • Implementing noise monitoring measures and management. • Avoid vegetation clearance during the breeding season.	2 3 M Post – Mitigation 1 3 L
Soils and Land Capability	• The removal of vegetation associated with the prospecting activities will allow for increased surface water runoff, which may lead to change in topographical characteristics of the area. • Land clearance during establishment of infrastructure will disturb the natural sequence of soil layers thereby changing the soil and land capability. • The movement of heavy vehicles in the operation area will result in compaction of soil, water runoff and soil erosion especially during the rainy season. • The equipment and vehicles may contaminate the soil due to hydrocarbon spillages.	• Removal of vegetation must be undertaken in a phased approach to limit the number of exposed areas at a time. • Regular roads maintenance of eroded shoulders. • A cleaned-up of any hydro-carbon spills on soil must be undertaken by trained personnel using commercially available emergency clean-up kits.	Pre – Mitigation 3 3 M Post – Mitigation 1 3 L
Surface water resources	• Contamination of water resources and deterioration of water quality; and • Disturbance of free drainage and runoff.	• Remediate using commercially available emergency clean up kits; and • Re-profiling and rehabilitation of the disturbed landscapes. • Implementing temporary erosion control measures.	Pre – Mitigation 3 3 M Post – Mitigation 2 2 L
Groundwater resources	• Changes in runoff and infiltration during the operation phase leading to reduce groundwater recharge. • Groundwater contamination from fuel & hydrocarbons leakages and spillages from the storage and transporting vehicles. • Baseflow reduction caused by proposed activity.	• Implementing measures to minimise the removal of vegetation and opportunities for revegetation will be maximised. • Implement groundwater monitoring to detect groundwater contamination. • Implementation of the mitigation measures to minimise hydrocarbon spills. • Conducting prospecting activities in low groundwater sensitivity area.	2 2 L
Noise	• Increase in ambient noise levels during the operational phase; • Disturbances to faunal species behaviour during the operational phase.	• Limiting the site establishment activities working hours to daylight hours (07h00 to 17h00) and not undertaking such activities at all on Sundays and public holidays. • Applying an operating buffer of a minimum 50m, but preferably 100m between drill site and any dwellings.	Pre – Mitigation 3 3 M Post – Mitigation 2 3 M
Air Quality/Dust		• Conduct dust fall-out monitoring.	Pre – Mitigation

	• Possible dust generation in some areas including the drilling during operations. • Heavy dust deposition can have detrimental effects on plants if the leaves are smothered to the extent where transpiration and photosynthesis are affected. • Health impacts on livestock and people in proximity to the project site due to fine particulate emissions during construction and operational phases.	• Enforcing the speed limits to reduce dust created by moving vehicles. • Haul roads in use will be subjected to dust suppression management measures. • Implement concurrent rehabilitation activities to minimise the number of exposed surfaces that would result in dust generation. • It must be noted that the speed limit for driving within a community and prospecting right shall be limited to 40Km/h on exposed surfaces.	2	3	M
			Post – Mitigation		
			1	3	L
Visual	• Visual disturbance due to site clearance. • Dust generated during site establishment. • View disturbance due to the operating of the equipment	• Ensure that all exposed surfaces are subjected to dust suppression. • Clearing of vegetation must be undertaken within the demarcated boundaries of the designated area only.	Pre – Mitigation		
			3	3	M
			Post – Mitigation		
			2	2	L
Socio-economic	• The effect of this prospecting activity for employment and socio-economic regime would be positive, but very limited in extent and duration. • Disturbance on the current commercial activities.	• Skill development and transfer. • Maximise procurement of goods and services from local providers.	Pre – Mitigation		
			1	3	L
			Post – Mitigation		
			2	2	L
Cultural and Heritage Resources	• Destruction of archaeological remains. • Disturbance of graves. • Disturbance of buildings and structures older than 60 years old. • Destruction public monuments and plaques.	• Use chance find procedure to cater for accidental finds. • Maintaining a 100m buffer from all identified 'no-go' areas with heritage resources. • Encountered heritage resources, including fossils, graves, or human remains must be reported to the relevant authorities.	2	2	L
Waste	• Waste Generation including general, scrap and hazardous waste. • If this waste is not stored correctly, can lead to environmental pollution including soil and water resources.	• Classification and separation of the waste into general or hazardous must be implemented onsite into different coloured and labelled bins. • Uncontrolled disposal of waste must strictly be prohibited on site	Pre – Mitigation		
			2	2	L
			Post – Mitigation		
			1	2	VL
Safety	Theft of equipment and the damage of infrastructure.	• Ensure that there is a controlled access to the site by deploying security personnel who would also conduct security patrols to monitor the perimeters of the project site thereby providing an increased security presence.	Pre – Mitigation		
			2	3	M
			Post – Mitigation		

		• Consult with the local police branch to establish standard operating procedures for the control and/or removal of loiterers. • All project infrastructure should be contained in a fenced and secured area to prevent unauthorized access and potential health and safety risks.	1	3	L
Health	The dust generation with potentially particulate matter, which can be inhaled, causing respiratory diseases.	• All area that are sources of dust must be subjected to dust suppression. • Continuous dust monitoring should be carried out throughout the project undertakings. • All employees will be issued with and instructed to wear the appropriated personal protective equipment (PPE).	Pre – Mitigation		
			2	3	M
			Post – Mitigation		
			1	3	L
*C – Consequences *L – Likelihood of consequences *R – Residual Risks VL – Very Low L – Low M – Medium H - High					

- **Public Participation Process followed:**

The PPP was carried out in accordance with the NEMA and aligned with the regulatory requirements outlined in Chapter 6 of the 2014 EIA Regulations (as amended). The public participation process is summarized below.

Table 12: Summary of the PPP followed.

Activity	Details
Identification of stakeholders	Lodgment of the stakeholder database which represents various sectors of society, including directly affected and adjacent landowners, in and around the proposed project area.
Distribution of BID and the I&AP registration form	Handing of BID with I&APs registration and some emailed to stakeholders from the 20th of September 2024.
Placing newspaper advertisement	A newspaper advertisement in the Ladysmith Gazette on the 05th of September 2024.
Putting up of site notices	Placing site notices at the proposed project site on 07th September 2024. A site notice placement report and map were developed to indicate the locations of site notices in and around the project area.
Announcement of Draft BAR	The Draft Basic Assessment Report was made available electronically, and copies were available to stakeholders on the Vahlengwe Mining Advisory and Consulting website (www.vahlengweadvisory.co.za) on 06th September 2024.
Consultation with Stakeholders	A stakeholder engagement meeting was held at Emaweni ranch to facilitate a discussion about the draft basic assessment report on the 19th of September 2024
Obtaining comments from stakeholders	Comments, issues of concern and suggestions received from stakeholders have been captured in the Comment and Response Report (CRR). The CRR is included in the updated Basic Assessment Report, which will be submitted to the DMRE and simultaneously made available to I&APs.
Announcement of Final Basic Assessment Report	The final report will be made available (www.vahlengweadvisory.co.za).

10. 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).

Table 13: Assessment of the potentially significant impact and risk

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	**Vegetation** Destruction of natural vegetation Loss of threatened plant species Invasion of alien and invasive vegetation Exposure to erosion Loss of biodiversity	Vegetation (flora)	Construction, Operational, and Decommissioning	Moderate	Environmental awareness and training to the contractors. Drilling sites to be located in less sensitive areas as far as possible. Rehabilitate the disturbed areas as far as possible. Vehicles should only use designated roadways to access the site. Have a biodiversity protocol and rehabilitation plan in place that will be implemented upon closure. Invasive plant material should be disposed by incineration, or alternatively, composting to break down seeds. If seedbank persists, invasive alien plant management and eradication measures should be implemented. Implement effective rehabilitation measures upon closure.	Low
	Animal Life Loss of priority fauna species Loss of resident fauna through increased disturbance. Displacement of resident fauna species.	Animal life (fauna)	Construction, Operational, and Decommissioning	Moderate	Environmental awareness and training for workers about the animal life on site. Killing of animals on site will be strictly prohibited and animal found on site must be safely removed from the operation. Implementing noise monitoring measures and management. Avoid vegetation clearance during the breeding season.	Low

	Noise Noise nuisance due to the drilling activities and movement of operating equipment and vehicle	Air quality Animal life	Construction, Operational, and Decommissioning	Low	Conducting regular equipment maintenance to minimise noise generated by the operating equipment. Limiting the operation times to daylight hours (07h00 to 17h00) on Mondays to Fridays, Saturdays (07h00 to 14h00) and no activities to be conducted on Sundays and public holidays. Maintaining a buffer of 100m between the operation area and dwellings.	Low
	Visual Visual disturbance to the surrounding due to the project activities Visual impact on observers travelling along the roads and residents	Aesthetic beauty of the surrounding Social practices around the area	Construction, Operational, and Decommissioning	Low	Minimise unvegetated areas as far as possible. Concurrent rehabilitation of all disturbed areas.	Low
	Air Quality Dust generation	Dust fall & nuisance from prospecting activities	Construction, Operational, and Decommissioning	Low	Implementation of the dust suppression system. Low vehicle speeds enforcement on unpaved surfaces. Maintain a buffer of 500m- 1000m between operational site and dwellings.	Low
	Soils and land Capability Soil Compaction leading to erosion and sedimentation. Destruction on current land use	Soil and vegetation Land use	Construction, Operational, and Decommissioning	Moderate	Provide adequate erosion control measures where required. No mixing of fertile soils with sub soils during construction. Implement concurrent and re-vegetate all disturbed with locally indigenous species as soon as possible.	Low
	Surface water Sedimentation and siltation of water courses Alteration of natural drainage patterns Contamination of water resources Degradation of surface quality	Surface water quality	Construction, Operational, and Decommissioning	Moderate	Remedy the possible effects of alteration to natural drainage lines. Implementing the hydrocarbon spillages management plan. Ensure that wastewater is appropriately managed. Implement the erosion control measures.	Low

	Groundwater resources Changes in runoff and infiltration Groundwater contamination from fuel & hydrocarbons leakages and spillages Baseflow reduction	Groundwater quality	Construction, Operational, and Decommissioning	Moderate	Implementing measures to minimise the removal of vegetation and opportunities for revegetation will be maximised. Implement groundwater monitoring to detect groundwater contamination. Implementation of the mitigation measures to minimise hydrocarbon spills. Conducting prospecting activities in low groundwater sensitivity area.	Low
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	**Health and Safety** Health and safety of employees and surrounding communities	Human health and safe working environment	Construction, Operational, and Decommissioning	Moderate	All employees or sub-contractors entering site must be inducted to ensure the awareness of the developed health and safety plan. Appoint a health and safety representatives to be appointed during operations. Conduct daily inspections and observations of on-site activities shall take place. All incidents to be reported, recorded, investigated, and mitigated. Employees or sub-contractors must be informed as to what required PPE is applicable in working sections and must always be equipped with appropriate PPE. Safety signs to be provided in areas considered as high-risk areas. Provided adequate first aid services on site; and Promote ongoing health and safety awareness campaigns.	Low
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	**Socio-economic** Increased employment opportunities Local economic development	Economic activities such as the commercial farming Land uses	Construction, Operational, and Decommissioning	Moderate	Conduct consultation with local communities through the appropriate channels to ensure the use of local skills and businesses where possible. Ensure local employment and local services providers are appointed where possible from the local area; and	Low

					Ensure that goods and services are procured from within the local area as far as possible.	
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	**Heritage** Destruction of archaeological remains. Disturbance of graves. Disturbance of buildings and structures older than 60 years old. Destruction public monuments and plaques.	Loss of heritage & palaeontological resources	Construction, Operational, and Decommissioning	Low	Use chance find procedure to cater for accidental finds. Maintaining a 100m buffer from all identified 'no-go' areas with heritage resources. Encountered heritage resources, including fossils, graves, or human remains must be reported to the relevant authorities.	Low
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	**Traffic Management** Construction vehicles and access roads Operation staff transportation trips, maintenance, and delivery trips	Pressure on public transport infrastructure Socio-economic conditions	Construction, Operational, and Decommissioning	Low	The surface quality of the road is not negatively impacted resulting from vehicle movement. Sections of existing road surfaces which have been impacted on by the vehicle movement and Existing road surfaces must be utilised and maintained within baseline levels.	Low
-Site establishment -Construction of access roads -Prospecting activities (Drilling)	**Waste Management** General waste generation and hazardous waste generation	Soil contamination Contamination of water resources Impacts on human health	Construction, Operational, and Decommissioning	Low	Promoting the reduction, re-use, or recycle of waste where prevention is not possible; Disposal of waste to local waste disposal sites; Littering should be strictly prohibited; and Implement waste classification and separation system.	Low

11. 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):

A Screening Report for an Environmental Authorization was generated from the DFFE Web-based Environmental Screening Tool (Appendix 4). The following is a summary of the environmental sensitivities at the site where the proposed prospecting activities are to be undertaken. Consequently, the drilling activities will be undertaken on an area where there are no sensitivities.

Table 14: Environmental Sensitivity of the proposed area

Site A:

THEME	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme		X		
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme	X			
Palaeontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

Site B:

THEME	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme		X		
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Palaeontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

Specialist studies were conducted, and mitigation measures were recommended accordingly. See *appendix 5* for specialist reports.

12. Environmental impact statement

12.1. Summary of the key findings of the environmental impact assessment.

Most of the prospecting activities are non-invasive and hence will have no environmental or social impact. The invasive activities that entail the site establishment and the drilling of approximately 20 drill holes will have a minimal environmental and social impact as the overall site establishment and the drill sites will be confined to an area of approximately 0.6 hectares and 0.9 hectares respectively

The assessed impact ratings after implementation of the mitigation measures described above are as follows:

Table 15:Summary of the Environmental Impact Assessment

Aspects	Activity Phases	Impact significance	
		Pre – Mitigation	Post – Mitigation
Flora and Fauna	Construction, Operational, and Decommission	Moderate	Low
Noise	Construction, Operational, and Decommission	Low	Low
Visual	Construction, Operational, and Decommission	Low	Low
Air Quality/Dust	Construction, Operational, and Decommission	Low	Low
Soils and Land Capability	Construction, Operational, and Decommission	Moderate	Low
Surface and Groundwater Resources	Construction, Operational, and Decommission	Moderate	Low
Health and Safety	Construction, Operational, and Decommission	Moderate	Low
Socio – Economic	Construction, Operational, and Decommission	Moderate	Low
Cultural and Heritage Resources	Construction, Operational, and Decommission	Low	Low
Traffic	Construction, Operational, and Decommission	Low	Low
Waste	Construction, Operational, and Decommission	Low	Low

Most of the identified impacts will occur for a limited period and the extent of the impacts will be localised. All the identified impacts can be suitably mitigated with the residual impact ratings ranging from **low** to **negligible** significance. After drilling activities have been completed and the drill pads rehabilitated to predrilling status, the land will be returned to its pre-prospecting impacts state.

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

Table 16: Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

Proposed Activity	Aspects
Non – Invasive Activities	No impacts on site
Positive	
Invasive Activities: Site establishment, Operation and decommission	Potential for neighbouring communities to benefit from assistance with shared land management responsibilities.
	The opportunity of implementing processes around feral animal control.
	• Opportunities for indigenous employment and economic development. • Requirement for the supply of the goods and services from the local businesses; and • Requirement for short-term accommodation and thus benefiting the house rental and accommodation sector.
	• Supporting local recycling centre and local scrap metal merchant; and • Metals such as steel and copper wire will be collected in designated areas prior to removal from site for recycling.
	Potential for neighbouring communities to benefit from assistance with shared land management responsibilities.
	The opportunity of implementing processes around feral animal control.
	Negative
Invasive Activities: Site establishment, Operation and decommission	• Soil compaction and soil erosion due to the movement of heavy vehicles in the on-site; and • Soil contamination due to hydrocarbon spillages from the fuel storages and vehicles.
	• Introduction of alien vegetation; and • Loss of flora and fauna and habitat destruction.
	Erosion and sedimentation leading to soil scouring and increased turbidity of water courses and drainage lines downstream.
	Contamination of groundwater due to chemicals and hydrocarbons seepage.
	Noise nuisance due to moving vehicles and equipment.
	Dust creation during clearance, placement of infrastructure and the drilling operations.
	Increased visual intrusion due to operation infrastructure and the movement of the operating equipment and vehicles.
	Project is unsustainable in terms of job security due to the life of project.
	Indigenous resources, values, and aspirational impacts.
	Waste generation including the domestic, scrap and hazardous waste.
	Inheritance of occupational health problems and exposure to occupational hazards.
	Addition to the existing traffic of the movement of vehicles

12.3. 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 authorisation.

The objectives of the EMPr will be to:

- Provide sufficient information to strategically plan the prospecting activities as to avoid unnecessary social and environmental impacts.
- Ensure that the prospecting activities are conducted in a sustainable manner.
- Develop an approach that will ensure compliance with relevant legislations; and
- Provide a management plan that is effective and practical for implementation.

Through the implementation of the proposed mitigation measures it is anticipated that the identified environmental impact s can be managed and mitigated effectively.

- Heritage/cultural resources can be managed by avoidance of known resources and though consultation with landowners/stakeholders. Contractor personnel will also be briefed of these sensitivities and consequences of any damage/removal of such features; Should the exploration program advance to the drilling stage, a phase 1 heritage assessment will be undertaken prior to identification of drill sites once areas of drilling interest have been determined.
- Noise generation can be managed through consultation and restriction of operating hours and by maintaining equipment and applying noise abatement equipment if necessary.
- Visual intrusion can be managed through consultation with landowners/stakeholders and by suitable siting of drill pads and use of screens (natural vegetation or shade cloth etc).
- Dust generation can be managed by limiting as far as possible the exposure of surfaces, application of dust suppression methods on exposed surfaces and use of water during drilling.
- Soil disturbance and clearance of vegetation at drill pad areas will be limited to the absolute minimum required and disturbed areas will be re-vegetated with locally indigenous species as soon as possible.
- Protecting biodiversity by conducting the ecological impact assessment prior to any invasive activities being conducted to ensure that impacts of protected and vulnerable species are prevented and where impacts cannot altogether be prevented minimised and mitigated.
- Manage as far as possible the soil, surface water and groundwater contamination by hydrocarbons by conducting proper vehicle maintenance, refuelling with care to minimise the chance of spillages and by having a spill kit available on each site where prospecting activities are in progress.

- Conduct an appropriate public consultation and conflict resolution during stakeholder consultation phases. All prospecting personnel will be made aware of the local conditions and sensitivities in the prospecting area and that they always treat residents with respect and courtesy.

12.4. Aspects for inclusion as conditions of Environmental Authorisation.

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

It is the opinion of the EAP that the following conditions should form part of the authorisation:

- Maintain a buffer of 100m from sensitive areas.
- Maintain a minimum 500m (preferably 1000m) buffer from any infrastructure or dwelling.
- Conduct a heritage survey of the identified drill sites and access routes once these are known and prior to any activities being undertaken at these sites.
- Conduct an ecology and wetland survey of any identified drill sites and access routes that may fall within any critical endangered ecosystems; and
- Landowners and land occupiers should be engaged (re-consulted) at least 1 month prior to any site activities being undertaken once drill sites are known.

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

(Which relate to the assessment and mitigation measures proposed)

The location of site camp and drill sites is not yet known and will be identified through the phased approach of the prospecting programme. This assessment is therefore based on a desktop approach at a broad scale and assuming that the site camping and drilling could occur anywhere within the proposed prospecting area.

Once camp and drill sites have been identified, then specific focus will be given to ecological and Heritage screening and assessment along possible access routes to ensure that valued ecological components, threatened species and Heritage artefacts are not inadvertently damaged. In addition, landowners will be engaged with regards to the progress of the operation and to discuss the proposed invasive prospecting activities and identified locations with the landowner at that point in time.

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

12.6.1. Reasons why the activity should be authorized or not.

The applicant is committed to conduct the prospecting activities in a sustainable manner and to comply with the prescribed environmental legislations to protect the environment and manage as far as possible the impacts associated with the project. Therefore, the applicant will ensure that:

- The prospecting program will be developed in a phased manner commencing with non-invasive activities to bring refinement to understanding of the geological anomaly.
- The environmental impacts associated with the prospecting activities are deemed to be minimal provided that the proposed mitigation is implemented.
- In the event that the success exceeds expectations/assumptions, the financial guarantee will be reviewed annually and variation in the planned work programme will be revised in line with Section 102 of the MPRDA.
- With appropriate care and consideration, the impacts resulting from the prospecting activities can be suitably avoided, minimised, or mitigated.
- With implementing the appropriate rehabilitation activities, the impacts associated with the prospecting activities can be reversed; and
- Without implementation of prospecting activities, the knowledge concerning the potential mineral resource within the prospecting right area will not be confirmed.

12.6.2. Conditions that must be included in the authorisation.

The following conditions could form part of the authorisation:

- Maintain a 100m buffer from sensitive areas; • Maintain a 500m (preferably 1000m) buffer from any infrastructure or dwelling.
- Conduct a heritage survey of the identified drill sites and access routes across undisturbed land once they are known and before any activities are carried out at these sites.
- Conduct an independent ecology and wetland survey of the identified camp and drill sites, as well as access routes to be built on undeveloped land. A special emphasis should be placed on assessing any critical endangered ecosystems in the prospecting area; and
- Once the camp and drill sites have been determined, landowners and land occupiers should be consulted before any site activities begin.

12.7. Period for which the Environmental Authorisation is required.

The authorisation is required for the duration of the prospecting right which is an initial five (5) years plus a potential to extend the right by an additional three (3) years. Therefore, a period of approximately eight (8) years is required.

12.8. Undertaking:

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

The undertaking is provided at the end of the EMPr.

12.9. Financial Provision:

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

A financial provision of approximately **R62549.00 has** been budgeted for the prospecting programme over five (5) years, for rehabilitation activities.

12.9.1. Explain how the aforesaid amount was derived.

The financial provision calculations were undertaken in terms of the guidelines provided within the "DMR Guideline Document for The Evaluation of The Quantum of Closure-Related Financial Provision Provided by a Mine" (DMR, 2005). The closure components for the prospecting activities are summarised on the table below:

Table 17:Closure components to the prospecting activities

Components	Extent	Description
1.Dismantling of processing plant and related structures	0m^3	There will not be a processing of the material for this project
2(A). Demolition of steel buildings and structures	0m^2	There will be no steel structures
2(B). Demolition of reinforced concrete buildings and structures	0m^2	Only mobile offices and ablutions will be put on site and removed upon closure of the project
3. Rehabilitation of access roads	150m^2	There are temporary access roads that will require rehabilitation
4(A). Demolition and rehabilitation of electrified railway lines	0m	There are no electrified railway lines
4(B). Demolition and rehabilitation of non-electrified railway lines	0m	There are no non-electrified railway lines
5. Demolition of housing and/or administration facilities	0m^2	There is no housing that will require demolition
6. Opencast rehabilitation including final voids and ramps	0	No excavation will be required to be undertaken
7. Sealing of shafts, adits, and inclines	0m^3	There are no shafts, audits nor inclines on site
8(A). Rehabilitation of overburden and spoils	0ha	The spoils from the drilling will be used to backfill the drillholes.

8(B). Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	0ha	There is no processing waste deposits and evaporation ponds
8(C). Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	0ha	There will be no wastewater being generated on site
9. Rehabilitation of subsided areas	0ha	The prospecting activities are not associated with subsidence
10. General surface rehabilitation	0,305ha	The area that will require rehabilitation will include the site camp, drill sites and access roads
11. River diversions	0m	The prospecting area is not associated with river diversions
12.Fencing	0m	Fencing would not be required
13. Water management	0ha	There are water circulation dams that needs to be rehabilitated
14. 2 to 3 years of maintenance and aftercare	0ha	All disturbances will be subjected to rehabilitation

12.10.2. 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).

The above-mentioned amount has been provided for from operating expenditure within the Prospecting Work Programme. The amount is also reflected in the Prospecting Work Programme submitted to the DMRE.

Table 18: Cost estimate of the expenditure to be incurred for each phase of the proposed prospecting operation.

ACTIVITY	YEAR 1 Expenditure (R')	YEAR 2 Expenditure (R')	YEAR 3 Expenditure (R')	YEAR 4 Expenditure (R')	YEAR 5 Expenditure (R')
PHASE 1 (e.g., 12 months)					
Desktop Studies and Reconnaissance	15 000.00				
Geological Field Mapping	25 000.00				

Geophysical Survey		160 000.00			
PHASE 2 (e.g., 24 months)					
Diamond Drilling and Core Logging			1 220 000.00		
Rehabilitation					62549 .00
Sample analysis and Geological Modelling				60 000.00	
PHASE 3 (e.g., 12 months)					
Environmental & Rehabilitation Studies					250 000.00
Banking & Feasibility Studies				50 000.00	
Phase 4 (e,g. 12 months)					
Rehabilitation					62549.00
Annual Total	40 000.00	160 000.00	1220 000.00	110 000.00	312549.00
				Total Budget	1 84 2549.00

12.11. Specific Information required by the competent Authority.

12.11.1. 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: -

12.11.1.1. 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.**

A consultation process has been conducted during the environmental authorisation process. The consultation process has provided the affected persons the opportunity to raise any potential concerns, and the possible mitigations measures were proposed to be implemented to suit the needs and expectations of the interested and affected parties including the landowners and lawful occupiers of the proposed property. Concerns raised has been captured and addressed within the public participation section of this report to inform the decision-making process.

12.11.1.2. 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).

- **Archaeology**

The proposed prospecting site was surveyed for archaeological remains, however, given the previous and current land use activities, no archaeological remains were identified during the survey. Based on the field study results and field observations, the receiving environment for the proposed prospecting site is low to medium potential to yield previously unidentified archaeological sites during prospecting. The screening tool also indicated that that the proposed prospecting site is of low archaeological sensitivity. Literature review also revealed that no Stone Age sites are shown on a map contained in a historical atlas of this area. This, however, should rather be seen as a lack of research in the area and not as an indication that such features do not occur.

- **Burial grounds and Graves**

burial sites are found close to abandoned settlements and Archaeological sites. Detecting the presence of archaeological human burials within the landscape can be challenging, as these burials are typically unmarked at the surface and concealed by dense vegetation cover, and graves may have been eroded and lay flat and can only be indicated by the presence of tightly packed stones or bricks as is the case. The study identified a grave **MBS01** on the GPS coordinates **28°43'4.25"S, 30° 0'3.37"E**. The burial site is a solitary grave marked by stone cairns located close to the cattle kraal within the homestead. The study further notes that burial sites exist within homesteads or close to cattle kraals and detailed photographic recording could not be done as it requires consent from the grave custodians. It is important to note that during the Public Participation Process to be conducted by the EAP, communities would be asked to declare their graves and if any issues are to arise, they would then be forwarded to the Author.

- **Buildings and Structures**

The study area is in an area with settlements, game reserves and associated infrastructure. The study noted that the area is littered with buildings and structures. Various collapsed stonewalled structures were identified close to a derelict dip tank, adjacent to the Tugela River at the site MHB01 on the GPS coordinates 28°43'54.90"S 30° 8'39.07"E. The study noted that according to Section 34 of the NHRA Act of 1999 read together with Section 37 of the KwaZulu-Natal Amafa and Research Institute Act No. 05 of 2018, no historic building or structure maybe altered, refurbished, reconditioned or demolished without a relevant heritage permit. The identified structures were noted to be safe from the development as no prospecting is to occur within the vicinity of the structures and buildings.

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

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

The proposed prospecting activities (including the drilling) requested as part of this authorisation is the viable way a mineral resource can be identified and used to generate a SAMREC compliant resource which is a minimum requirement to determine whether it is viable to invest in a future mine. Therefore, the proposed prospecting activities to be undertaken will be part of the feasibility studies to determine whether the minerals of interest will be economically viable to mine.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

13. Environmental Management Programme Introduction.

13.1. Details of the EAP

(Confirm that the requirement for the provision of the details and expertise of the EAP is already included in PART A, section 2 herein as required).

This has already been covered. Refer to Part A, Section 2 of this document.

13.2. Description of the Aspects of the Activity

(Confirm that the requirement to describe the aspects of the activity that are covered by the environmental management programme is already included in PART A, section (5) herein as required).

This has already been covered. Refer to Part A, Section 5 of this document.

13.3. Composite Map

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

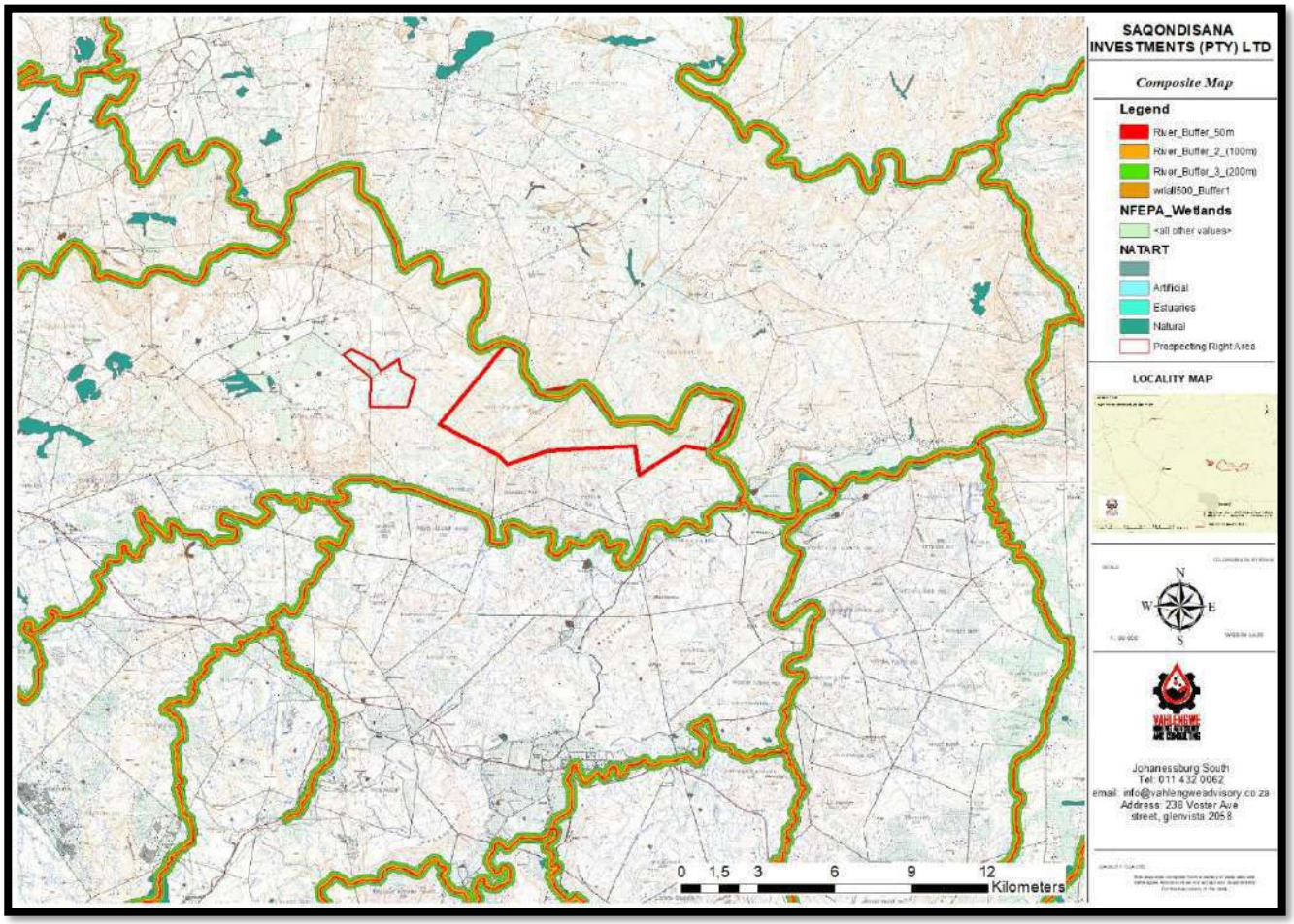

Figure 20: Composite Map

14. Description of Impact management objectives including management statements

The proposed impact management objectives and management statements are informed by the environmental setting of the site where the proposed prospecting activities will be undertaken, and the desired state post rehabilitation of the site.

14.1. Determination of closure objectives

The vision, and consequent objectives and targets for rehabilitation, decommissioning, and closure, are intended to reflect the local environmental and socio-economic context of the project, as well as to reflect both the corporate requirements and stakeholder expectations.

The receiving environment within which the prospecting activities will be undertaken include the following key land-uses:

- Nature Conservation.
- Agricultural activities; and
- Livestock Grazing

In practice, the post-closure land-use has been determined by the pre-prospecting land use applicable to the precise area of the invasive prospecting activities. Given that the exact locations of the intended prospecting activities have been identified and assessed, it can be said that the closure plan will sufficiently address the objectives for the preferred alternative. This EMPr, on the other hand, aims to address the key closure objectives, which are likely to remain consistent over most prospecting activities.

The Rehabilitation plan shall outline the closure objectives, which are focused at restoring the landform, land use, and vegetation units to their pre-prospecting state, unless the landowner requests a specified, justifiable replacement land use. As a result, the disturbed prospecting areas' planned end land use and closure objectives will be specified in consultation with the relevant landowner. Evidence of such consultation will be given with an application for Closure Certificate. The overall goal of the rehabilitation plan is to rehabilitate the area to as close as its pre-prospecting condition as possible. This will be accomplished through a series of established objectives:

- Ensuring that the area is safe for people and animals. This entails sealing boreholes and rehabilitating any areas that may pose a safety hazard.
- Recreating a free draining landform which entails earthworks infilling, reshaping, and levelling of all the disturbed landscapes to recreate as close as possible the original topography and to ensure a free draining landscape.

- Re-vegetation which involves either reseeding or allowing natural succession depending on the type of vegetation in the area, climate, and the landscape class; and
- Verification of rehabilitation success, which involves monitoring of rehabilitation and ensuring that area is eligible for closure.

14.2. Volumes and rate of water use required for the operation.

The water required for prospecting activities will be obtained through an arrangement with an existing authorised water user, which might be either the landowner or the local municipality. Prior to drilling, the department in responsible for water resources shall be consulted about any water-related agreement with either the landowner or the local municipality. No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act No. 36 of 1998).

14.3. Has a water use licence been applied for?

None of the proposed planned prospecting activities fall under the scope of Section 21 of the National Water Act of 1998, (Act No. 36 of 1998). As a result, no water use licence application is required for the proposed prospecting activities.

14.4. Impacts to be mitigated in their respective phases.

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

Table 19: Impacts Mitigation

Activities	Phase	Size and Scale of Disturbance	Mitigation Measures	Compliance with Standards	Time Period for Implementation
Site Clearance	• Construction • Operation	0.305 ha, short term and localized	• Minimize clearance of vegetation as much possible. In instances where it is possible, cut vegetation instead of clearing to minimize soil disturbance. • Use of hand cutting techniques wherever possible and minimise the usage of heavy machines when clearance of vegetation is undertaken to prevent soil disturbance. • Any larger fauna species discovered prior to and during vegetation clearance should be given the opportunity to relocate away from the machinery that will be used for construction and prospecting activities. • Sensitive areas should be demarcated and treated as No-Go areas. • Methods for minimizing potential harm to fauna species should be used during vegetation clearance. To maximize the potential for mobile species to move to adjacent areas, clearing must be gradual and slow, beginning from the interior of the site and continuing outwards towards the boundary. • Indigenous vegetation, even secondary communities should not be fragmented under any circumstances or further disturbed. • To avoid the spread of exotic or invasive species or the unlawful collection of plants, no plant species, whether indigenous or exotic, shall be brought into or taken from the proposed project area. • Utilize local labour if possible. • Vehicle movement should be restricted to provided access roads. • Implement alien vegetation management. • Implementing mitigation measure to prevent and manage hydrocarbon spills. • Conducting water quality and quantity monitoring. • No prospecting activities to be conducted at or near sensitive water resource areas.	NEMA MPRDA NEMBA NEMAQA Dust regulations NWA	Throughout prospecting
Site Access	• Construction • Operation	Short term and localized	• When on site, the Applicant and/or contractors must take into consideration not to interfere with current land uses and practices. • All site employees and visitors must be taken through a site induction, which includes basic environmental awareness as well as site-specific environmental requirements such as site sensitivities and appropriate protocols/procedures. Wherever possible, the Contractor's Environmental Officer should present or facilitate this induction.	NEMA OHS and MHSA	Throughout prospecting
Establishment Of site infrastructure	• Operation	0.105 ha, short term and localized	• Vehicles and machinery must use existing access routes as far as possible to prevent unnecessary construction of new routes. • Ensure proper and adequate drainage. • Dust suppression should be undertaken when required to reduce the usage of water. Dust suppression strategies should be in accordance with applicable standards for PM_{10} AND $PM_{2.5}$. • Ensure that prospecting is in accordance with occupational health and safety regulations.	NEMA MPRDA NEMBA NEMAQA Dust regulations NWA	Throughout prospecting process

			• All drill sites must be protected, with security access control and warning signs to ensure no person or animal can access these sites. • All laydown, chemical toilets should be restricted to least sensitive areas. • Noise must be kept to an absolute minimum during all the prospecting phases to minimize the impact of the development on the fauna that lives on the site. • Permanent structures should not be permitted on site. Buildings should preferably be prefabricated or constructed from reusable/recyclable materials. • Contractors working on the project should have spill kits available to ensure that any fuel or oil spills are cleaned up and disposed of properly.		
Storage of hazardous substances	• Construction • Operational	Short term and localized	• To prevent pollution of the environment or harm to humans or animals, all hazardous substances such as fuel, grease, oil, brake fluid, hydraulic fluid must be handled, stored, and disposed of in a safe and responsible manner. Appropriate spillage prevention measures must be implemented. • If there are any major spills of hazardous materials, they must be reported in accordance with Section 30 of the NEMA. • All chemicals and toxicants used in the construction must be stored away from sensitive areas and in a bunded area.	NWA NEMWA NEMA	Throughout prospecting process
Waste management	• Construction • Operation	Short term and localised	• Waste generated on-site must be classified and separated using the color-coding method. • Waste management must be prioritized, and all waste must be properly collected and disposed of. • Recyclable waste must not be stored on site for extended periods to prevent risk of environmental pollution. • To prevent rodents and pests from entering the site, it is recommended that all waste be removed on a weekly basis. • A Waste Management System must be put in place, with adequate waste storage in a form of covered containers, waste separation for recycling, and frequent removal of non-recyclable waste for permanent disposal at an appropriately licensed waste disposal facility. On-site waste disposal will be prohibited.	NEMWA	Throughout prospecting activities
Storage of construction vehicle	• Construction • Operation	Short term and localised	• Any equipment that may leak and is not required to be transported on a regular basis must be placed on watertight drip trays to catch any possible pollutant spills. The drip trays must be large enough to accommodate the equipment. • Drip trays must be cleaned on a regular basis and must not overflow. All spilled hazardous substances must be collected and disposed of properly at a properly licensed facility. • Soil compacting must be avoided as much as possible, and the use of heavy machinery must be restricted in areas of the intended prospecting sites. • Storage spaces must be located outside of the buffer zones.	NWA	Throughout prospecting activities
Transportation / access to and from drill sites	• Construction • Operation	short term and localized	• Drill sites should be located along existing access roads whenever possible to minimize the need for additional access roads. • All prospecting/operational and access must make use of the existing roads as far as possible. • Under no circumstances may the contractor damage any existing structures on the where the prospecting activities are to be undertaken	NEMA NEMBA CARA NEMAQA NWA Dust Regulations	Throughout prospecting

			• On-site vehicles must be restricted to approved access routes and locations on the site in order to reduce excessive environmental disturbance to the soil and vegetation on site. • Damage to public roads caused by prospecting activities must be repaired in consultation with the appropriate municipal authorities.		
Prospecting boreholes	Operation	0.2 ha, short term and localized	• To minimize the period of disturbance on fauna and flora, the duration of prospecting activities should be kept as short as possible. • To minimize the disturbance footprint, vegetation clearance for prospecting sites should be kept to a minimum. • Always adhere to approved plans to avoid encroachment on the sensitive areas. • The recommended buffer zones must be strictly adhered to. Buffer zones must be clearly demarcated and monitored as No-Go areas. • Adequate sanitary ablution facilities on the servitude must be provided for all personnel throughout the project area. • Prepare action plans and train contractors and staff in the case of spills, leaks, or other impacts to aquatic systems. • To prevent soil compaction, soil compacting must be avoided as much as possible, and the use of heavy machinery must be restricted in areas outside of the intended prospecting sites. • Dust-reducing mitigation measures must be implemented and strictly enforced, particularly for all roads and spoils. This includes watering exposed soft soil surfaces and not conducting activities on windy days, which increase the risk of dust generation. • Any potentially noisy activities or work should be undertaken at suitable times of the day. These works should not be carried out at night or on weekends. • Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals. • Outside lights should be directed away from sensitive environments such as wetlands. Fluorescent and mercury vapor lighting should be avoided, and instead use sodium vapor (yellow) illumination whenever possible. • To avoid migrating, nesting, and breeding seasons, prospecting activities and operations should be scheduled during the least sensitive periods. • The holes need to be sealed to ensure that no fauna species can fall in the drill hole. • On-site vehicles must be restricted to approved access routes and areas on the site in order to reduce excessive environmental disturbance to the soil and vegetation on the site. • Workforce should be kept within defined boundaries and to agreed access routes. • No invasive prospecting activities to be undertaken within 50m of a watercourse. • Should any watercourse be affected, then the necessary water use licences should be obtained from the Department of Water and Sanitation • No ablution or site laydown areas are to be located within 150m of a watercourse.	SANS 10103 Noise Regulations NEMAQA Dust Regulations NWA	Throughout prospecting and decommissioning
Borehole closure	• Decommissioning • Closure	Short term and localised	• When drilling and groundwater is encountered with, all affected prospecting boreholes that will not be required for any useful purposes should be closed and sealed with cement to minimize possible cross flow and contamination between aquifers.	NWA NEMWA NEMA	Throughout Decommissioning and Closure

			• Because of the very high pH of the material and the chemicals contained within cement and liquid concrete, they are hazardous to the natural environment. Consequently, the contractor must ensure that: o Concrete shall not be mixed directly on the ground. o The visible residues of concrete, whether solid or from washings, must be physically removed and disposed of as waste as soon as possible. o All excess aggregate shall also be removed.		
Waste removal	Decommissioning	Short term and localised	• Excess or waste material or chemicals, including drilling muds, must be removed from the site and, if possible, recycled (for example, oil and other hydrocarbon waste products). Any waste materials or chemicals that cannot be recycled must be disposed of at a waste facility that is properly licensed.	NEMWA	Decommissioning
Surface infrastructure removal	Decommissioning	Short term and localised	• All infrastructure, equipment, and other items erected during prospecting activities shall be removed from the site. • Soil compaction should be avoided as much as possible. Heavy machinery use must be prohibited in areas outside of proposed prospecting sites to reduce soil compaction.	• MPRDA • Rehab Plan	Decommissioning
Rehabilitation	Rehabilitation	All disturbed areas	• Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. • Clearing of vegetation should be minimized and avoided where possible. • Maintain small patches of natural vegetation within the prospecting site to accelerate restoration and succession of cleared patches. • Areas that are denuded during prospecting need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. • All structure footprints to be rehabilitated and landscaped concurrently as the prospecting activities progress is complete. • Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type. • Progressive rehabilitation will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. • Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion	• NEMA • OHS and MHSA • MPRDA Rehab Plan	Decommissioning
Consultation	• Planning • Construction • Operation	Medium term, localised	• Stakeholder engagement will continue throughout the prospecting process to ensure that the community and landowners are kept informed and could address their concerns.	• NEMA	Throughout Planning, construction and operation

14.5. Impact Management Actions And Outcomes

Table 20: Impact management actions and outcomes.

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 • Soil erosion and compaction • Impact on Flora and Fauna • Impact on heritage resources	• Topography • Soil • Air Quality • Surface Water • Groundwater • Transportation • Visual receptor • Heritage resources	• Construction • Operation	• Avoid and control through implementation of EMPr mitigation measures such as speed limit enforcement and vehicle maintenance	• NEMA • NEMBA • CARA • Threatened or Protected Species (TOPS) regulations • NEMAQA • Dust regulations • NWA • NHRA
Storage of construction vehicles	• Soil compaction • Contamination of surface and ground water • Spillage of oils, fuels, and chemicals • Soil contamination or pollution	• Surface water • Groundwater • Soils	• Construction • Operation	• Avoid through implementation of EMPr mitigation measures such as communication with landowners. • Control through implementation of ESMS	• NWA • DWAF best Practice Guidelines • NEMA
Storage of hazardous substances	• Spillage of oils, fuels, and chemicals	• Surface water • Groundwater • Soil • Pollution	• Construction • Operation	• Avoid through implementation of EMP mitigation measures	• NEMA • NEMBA • NWA
Waste management	• Generation and disposal of waste	• Pollution	• Construction • Operation	• Avoid through implementation of EMPr mitigation measures	• NEMA • NEMWA
Transportation to and from drill sites	• Disturbance and Loss of fauna and flora • Wear and tear of existing roads • Dust generation from increased traffic.	• Fauna and Flora • Air quality	• Construction • Operation • Decommissioning	• Avoid and control through implementation of EMPr mitigation measures such as speed limit enforcement, vehicle maintenance.	• NEMA • NEMBA • CARA • Threatened or Protected Species (TOPS) regulations • NEMAQA • Dust regulations • NWA
Prospecting boreholes	• Vegetation clearance • Removal of topsoil • Land use conflict • Dust generation	• Ecology • Topography • Access/footprint • Soil disturbance	• Construction • Operation • Decommissioning	• Control through implementation of EMPR mitigation measures	• SANS10103 • Noise Regulations • NEMAQA • Dust regulations

	• Disturbance of wildlife and communities in close vicinity • Damage to local roads • Disturbance or damage of terrestrial biodiversity resources • Influx of people who are seeking jobs. • Wastewater discharge • Spillage and leaks of hydrocarbons and Waste disposal. • Disruption of the heritage resources	• Noise • Air Quality • Socioeconomics • Groundwater • Heritage resources			• NWA • NHRA
Borehole closure	• Erosion due to removal of vegetation and topsoil. .	• Erosion	• Rehabilitation and Closure	• Control through implementation of EMPR mitigation measures	• NEMA • NEMBA • NWA
Rehabilitation	• Erosion • Loss of habitat • Disturbance to wildlife and communities in close vicinity	• Topography • Land use • Soil disturbance • Ecology	• Rehabilitation	• Control through implementation of EMPR mitigation measures	• MPRDA in accordance with Rehabilitation plan
Monitoring of rehabilitated sites	• Erosion • Disturbance to flora and fauna.	• Topography • Land use • Soil • Disturbance of Ecology	• Post-closure	• Control through adhering to monitoring requirements	• MPRDA and regulations

15. Financial Provision

15.1. Determination of the amount of Financial Provision

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

The general goals of the prospecting closure include securing beneficial and widely agreed-upon post-prospecting land uses. Removal of all generated wastes constructed infrastructure, and materials, re-vegetation of disturbed and cleared areas, rehabilitation of access roads to ensure the growth of existing grasses and plant species, and clean-up of hydrocarbon spillages should all form part of the closure plan. The following are the primary closure objectives:

- All existing structures and facilities are physically stable, capable of withstanding foreseeable environmental conditions and events, pose no threat to health and safety, and perform their intended long-term functions.
- Contaminants must not be released or transported from the site at levels that are hazardous to human health or biota, or that are otherwise unacceptable.
- The biological environment is restored to a natural, balanced, self-sustaining ecosystem that compatible with the planned post-prospecting land use. Other closure measures must create physical, chemical, and hydrological conditions that allow for such long-term ecosystems.
- Ensure that the site has been made visually appealing.
- Closure of the prospecting activities must ensure the quantity and quality of the site's natural resources.
- Maximize the desired post-prospecting land use.
- Mechanisms for post-closure monitoring are in place for the outstanding liability and risks.

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

This Basic Assessment Report and Environmental Management Programme was made available to each registered stakeholder for review and comment. All comments were captured in the CRR and were included into the report.

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

Because of the nature of the activities, the impacts will be confined and temporary. The management programme is created in such a manner that concurrent rehabilitation is attainable. Following the completion of planned invasive activities, Saqondisana Investment will ensure that the site is returned to its former state by carrying out the following measures:

- Decommissioning of all infrastructures that were used on site during the prospecting activities.
- The whole drill site will be inspected for any signs of hydrocarbon spillages. Any identified soil which has been polluted because of the drilling activities will be remedied and waste disposed of in a registered landfill site.
- Ensure that no waste material (plastics, papers, pipes) is left behind on the drill site.
- Any area compacted because of the drill rig will be ripped and any furrows created by accessing or leaving the site for the drilling activity will be filled in to ensure that no future erosion shall occur on site.

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

The impacts will be limited and temporary due to the nature of the activities. The management strategy is structured in such a way that concurrent rehabilitation is possible. The most impacted areas will be those where drilling will take place. The activities in this case will be temporary, and a detailed management programme has been developed to address any potential consequences.

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

A financial provision of approximately **R62549.00** has been budgeted for the prospecting programme over eight (8) years, for rehabilitation activities.

The financial provision calculations were undertaken in terms of the guidelines provided within the “DMR Guideline Document for The Evaluation of The Quantum of Closure-Related Financial Provision Provided by a Mine” (DMR, 2005). The closure components for the prospecting activities are summarised on the table.

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

Should Prospecting Right be granted, Saqondisana Investment (Pty) Ltd will make provision for the estimated closure cost by means of a Bank Guarantee or any other means available and accepted by the Competent Authority.

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

16.1. Monitoring of Impact Management Actions

16.2. Monitoring and reporting frequency

16.3. Responsible persons

16.4. Time period for implementing impact management actions

16.5. Mechanism for monitoring compliance

Table 21: Compliance Monitoring and Frequency

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementation
Desktop studies and acquisition of historic data	• None	• None	• None	• None
Geological field mapping	• None	• None	• None	• None
Remote sensing and Geophysical Surveys	• None	• None	• None	• None
Site establishment -Vegetation clearance -Alien vegetation removal -Vehicle and equipment movement -Placing of infrastructure	• Disturbance of Flora and Fauna. • Impacts on soils and land capability. • Contamination of water resources and deterioration of water quality	• Document control. • Site Inspections and checklists; and • Report reviews and Development of actions plans	• Contractors Environmental Representative. • Environmental specialist, ECO; and • Senior Environmental Management Officer	• Once-off control of documents, site visit and reporting. • Monthly site visits. • Monthly Reports; and • Annual Performance Assessment

	• Groundwater quality deterioration. • Noise and dust generation; and • Visual and topography disturbance			
Target Prospecting Boreholes	• Alien vegetation management. • Noise nuisance. • Air quality due to dust generation; and • Surface and groundwater management	• Site Inspections and checklists; • Report reviews and development of corrective action plans. • Inspection of surface water features; and • Survey of groundwater users and use within 5km of the invasive prospecting sites.	• Contractors Environmental Representative. • Environmental specialist. • ECO. • Senior Environmental Management; and • Geohydrologist (if required)	• Once-off control of documents site visit and reporting. • Monthly site visits. • Monthly Reports Annual Performance; and • Prior to invasive prospecting activities and monitoring post-prospecting.
Ablutions - Chemical Toilets	• Groundwater contamination; and • Health impacts on workers	• Site Inspections and checklists	• Contractor Environmental Representative	• Daily inspections and checklists
Access Route (Existing roads to be utilised)	• Dust generation	• Site Inspections and checklists	• Contractors Environmental Representative	• Monthly inspections and checklists
Temporary general waste storage (General/domestic waste)	• Visual disturbances; • Soils contamination; and	• Site Inspections and checklists	• Contractors • Environmental	Monthly inspections and checklists

	• Surface water and Groundwater contamination		Representative	
Temporary hazardous waste storage (Hazardous waste – Sealed Container)	• Surface water and groundwater contamination; and • Soils contamination	• Site Inspections and checklists	• Contractors • Environmental Representative	Weekly inspections and checklists
Undertake decommissioning and rehabilitation as per the rehabilitation plan	• Alien vegetation management. • Fire management plan. • Noise generation; and • Air quality	• Site Inspections and checklists; and • Report reviews and development of corrective action plans	• Contractors Environmental Representative. • Environmental specialist, ECO; • Senior Environmental Management Officer; and • Surface water specialist	• Monthly site visits; and • Monthly Reports and Annual Performance Assessments
Monitoring of rehabilitation efforts	• All Impacts Identified in the EMPr	• Site Inspections and checklists	• ECO; and • Independent Environmental Auditor	• Monthly reports

17. Indicate the frequency of the submission of the performance assessment/ environmental audit report.

Annual environmental performance audit report will be undertaken alternating between internal and independent EAP after the granting of the authorisation. It requires the holder of the authorisation to ensure compliance with all the conditions of the EA and/or the EMPr, and of which the conduct of the proposed activities must be audited against these conditions. It is also recommended that an internal audit specified in the previous section be carried out on an annual basis, at least before the independent audit. This audit report must then be submitted to the competent authority. This audit report must adhere to the following conditions:

- Be prepared by an **independent** person with the relevant environmental auditing expertise.
- Provide verifiable findings, in a structured and systematic manner, on-
  - (i) the level of performance against and compliance of an organization or project with the provisions of the requisite environmental authorisation or EMPr and, where applicable, the closure plan; and
  - (ii) the ability of the measures contained in the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity.
- Contain the information set out in Appendix 7 of GN R. 326; and
- Be conducted and submitted to the competent authority at intervals as indicated in the environmental authorisation.

The purpose of this audit report is also defined in the regulations and is as follows:

- Determine the ability of the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an ongoing basis and to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the project area; and
- Determine the level of compliance with the provisions of environmental authorisation, EMPr and where applicable the closure plan.

18. Environmental Awareness Plan and Training

Training and environmental awareness is an integral part of a complete EMPr. The overall aim of the training will be to ensure that all site staff are informed of their relevant requirements and obligations pertaining to the relevant authorizations, licenses, permits and the approved EMPR and protection of the environment.

The applicant and contractor must ensure that all relevant employees are trained and capable of carrying out their duties in an environmentally responsible and compliant manner and can comply with

the relevant environmental requirements. To obtain buy-in from staff, individual employees need to be involved in:

- Identifying the relevant risks.
- Understanding the nature of risks.
- Devising risk controls; and
- Given incentive to implement the controls in terms of legal obligations.

The applicant shall ensure that adequate environmental training takes place. All employees shall be given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. All training must be formally recorded, and attendance registers retained. The environmental training should, as a minimum, include the following:

- General background and definition to the environment.
- The importance of compliance with all environmental policies.
- The environmental impacts, actual or potential, of their work activities.
- Compliance with mitigation measures proposed for sensitive areas.
- The environmental benefits of improved personal performance.
- Their roles and responsibilities in achieving compliance with the environmental policy and procedures and with the requirement of the applicant's environmental management systems including emergency preparedness and response requirements.
- The potential consequences (legal and/or other) of departure from specified operating procedures.
- The mitigation measures required to be implemented when carrying out their work activities;
- Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of Red / Orange List species, their identification, conservation status and importance, biology, habitat requirements and management requirements of the Environmental Authorisation and within the EMPr; and
- All operational risks must be identified, and processes established to mitigate such risk, proactively. Thus, the applicant needs to inform the employees of any environmental risks that may result from their work, and how these risks must be dealt with to avoid pollution and/or degradation of the environment.

In the case of new staff (including contract labour) the contractor / applicant shall keep a signed register of attendance for proof and record of adequate environmental induction training.

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

Environmental awareness could be fostered by induction course for all personnel on site, before commencing site visits. Personnel should also be alerted to environmental concerns associated with their tasks for the area in which they are working. Courses must be given by suitably qualified personnel and in a language and medium understood by personnel. The environmental awareness training programme will include the following:

- Occupational Health and Safety Training (OHS)
- Environmental Awareness Training on EMPr management actions.

Environmental awareness training will focus on the following specific aspects and be undertaken in "Toolbox talk "topics prior to site access:

- Waste collection and disposal;
- Sensitive environmental receptors;
- Identification of Red/ Orange List species, conservation status and importance, biology, habitat requirements and management requirements of the environmental authorisation and EMPr; and
- EMPr management options and application.

18.2. Manner in which risks will be dealt with to avoid pollution or degradation.

The broad measures to control or remedy any causes of pollution or environmental degradation because of the proposed prospecting activities taking place are provided below:

- Contain potential pollutants and contaminants (where possible) at source;
- Handling of potential pollutants and contaminants (where possible) must be conducted in bunded areas and on impermeable substrates.
- Ensure the timeous clean-up of any spills.
- Implement a waste management system for all waste stream present on site; and
- Investigate any I&AP claims of pollution or contamination because of prospecting activities

It is of critical importance that the broad measures to control or remedy any causes of pollution or environmental degradation are applied during onsite prospecting activities.

19. Specific information required by the Competent Authority

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

In accordance with the provisions of Regulation 23(3) of the EIA 2014 Regulations (as amended) the EIA should include all information required as set out in Appendix 3 and in terms of Regulation 23(4) the Environmental Management Plan (EMP) should contain all information required as set out in Appendix 4. The EIA report must include the following:

- Details of the EAP who prepared the report and the expertise of the EAP, including a

curriculum vitae;

- A plan, which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale.
- A description of the scope of the proposed activity.
- A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.
- A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location.
- A full public participation process including a CRR in the BAR.
- Impact Assessment, including methodology, of the necessary environmental aspects, including the nature, significance, extent, duration, and probability of the impacts occurring, positive and negative impacts, including mitigation and monitoring measures.
- An assessment of the proposed alternatives.
- A complete EMPr.
- The financial provision for the environmental liability which will be reviewed annually.
- An impact statement from the EAP, specific information the Competent Authority may require, and conditions for approval; and
- An EAP oath regarding the correctness of information provided in the report.

20. UNDERTAKING

The EAP herewith confirms;

- the correctness of the information provided in the reports; ☒
- the inclusion of comments and inputs from stakeholders and I&APs; ☒
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- 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:

Vahlengwe Mining Advisory and Consulting (Pty) Ltd

Name of company:

14 February 2025

Date:

-END-

Appendix 1:

Appendix 1: CV for the EAP

SUNDAY MISHACK MABASO

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Email - sunday@vahlengweadvisory.co.za · LinkedIn Profile - Sunday Mabaso ·Twitter @Sun.dayMabaso

BIOGRAPHY

Mr. Sunday Mabaso is the founder and CEO of Vahlengwe Mining Advisory and Consulting. He's got extensive experience in mineral regulation gained from spending over 20 years (2000 – 2021) with the Department of Mineral Resources and Energy (DMRE) where he served his last seven years as Regional Manager (3 years in Northern Cape and 4 years in Gauteng) before his resignation to advance his career in business. In 2020 was nominated to the Task Team that developed the "South Africa's Exploration Implementation Plan" where he served to its completion and officially gazetted by Minister of Mineral Resources and Energy in 2022.

He holds a National Diploma in Mine Surveying and a National Higher Diploma in Mineral Resource Management from Technikon Witwatersrand in 1999 and 2000 respectively, a Graduate Diploma (GDE) in Mining Engineering from University of Witwatersrand in 2009 and a Master of Business Administration (MBA) from Milpark Business School in 2021. Sunday also completed a Post Graduate Certificate in Climate Change and Energy Law from University of the Witwatersrand in 2021, a Certificate in Energy Efficiency and Sustainability from the University of Cape Town (UCT) in 2022 and Certificate in Mine Closure and Land Rehabilitation from University of Pretoria (UP) in 2022.

Sunday is a registered member of the Institute of Directors of South Africa (IoDSA), the Southern Institute of Mining and Metallurgy (SAIMM) and is an Environmental Assessment Practitioner registered with EAPASA, also a member of the International Association of Impact Assessment South Africa (IAIAsa). A committee member of the Environmental, Social and Governance (SAMESG) working group of the SAMCODES Standard Committee (SSC) responsible for developing the South African Mineral Reporting Codes. He has authored opinion and journal articles about South African mining legislation with interests focused on social and environmental impacts on mine communities affected by mining operations, past and present. Some of his articles are published in academic journals and books internationally.

PUBLICATIONS

Mabaso, SM. (2023) Legacy Gold Mine Sites & Dumps in the Witwatersrand: Challenges and Required Action. Natural Resources, 14, 65-77. https://doi.org/10.4236/nr.2023.145005

Mabaso, SM. (2023). Social and Environmental Challenges caused by Legacy Gold Mining in Johannesburg: Government's Action Plan. eBook: ISBN: 978-81-19491-53-7. DOI: 10.9734/bpi/npgees/v9/10672F

Ramontja, T. and Mabaso, S. 2022. *Evolution of South Africa's Mining Regulatory Framework as it Relates to the Empowerment and Participation of Mining Communities.* https://doi.org/10.1007/978-3-031-07048-8_6

PROFESSIONAL AFFILIATIONS

- EAPASA: Environmental Assessment Practitioner (EAP) No 2022/4485
- International Association of Impact Assessment South Africa (IAIAsa) No 7442
- Southern Institute of Mining and Metallurgy (SAIMM) No 709244
- Institute of Directors in South Africa (M.Inst.D)
- Land Rehabilitation Society of Southern Africa (LaRSSA)
- International Society for Development and Sustainability (ISDS)

COMMITTEES

- South African Mineral Reporting Codes (SAMCODES) Standards Committee, 2016 to 2021
- SAMCODES-ESG Subcommittee – 2021 to date

EXPERIENCE

01 MAY 2021 – DATE
FOUNDER AND CEO: VAHLENGWE MINING ADVISORY AND CONSULTING
CORE SERVICES

- MPRDA and NEMA
- Mining Charter
- Environmental, Social and Governance - ESG
- Mine Closure and Rehabilitation
- Waste Management
- Carbon Tax Reporting
- Compliance Inspections
- Assistance to junior and small-scale miners

01 AUGUST 2014 – 30 APRIL 2021
REGIONAL MANAGER, DEPARTMENT OF MINERAL RESOURCES AND ENERGY

(NORTHERN CAPE –AUGUST 2014 TO APRIL 2017 AND GAUTENG – MAY 2017 TO APRIL 2021)

- Effective implementation and administration of the MPRDA
- Implementation and administration of Environmental Management policies and regulations in terms of NEMA and NEM: Waste Act
- Implementation and administration of Social and Labour Plans in terms of MPRDA
- Evaluation of Mining and Prospecting Work Programs and monitoring compliance
- Management of Land Use in mining areas to promote development and coexistence.
- Management of community development through implementation of the Mining Charter
- Promoting participation of Historically Disadvantaged South Africans in the mining economy and the value chain
- Management of relations and conflict resolutions between mining communities and mining companies
- Management of Financial and Administrative systems and procedures in the Regional Office
- Provide support and advisory to the Deputy Director General in the department

01 APRIL 2007 – 31 JULY 2014

DEPUTY DIRECTOR: MINE ECONOMICS, DEPARTMENT OF MINERAL RESOURCES

- Adjudication of mineral rights applications and manage sustainability of mining operations in line with the Mining/Prospecting Work programs.
- Monitor compliance through inspections and issuing of compliance directives.
- Assisting junior coal miners to access export markets through the Quattro Task team.
- Assist new entrants and junior miners in the mining industry.
- Conduct asset and mineral valuations for tax purposes and Section 11 applications

01 DECEMBER 2000 – 31 MARCH 2007

INSPECTOR OF MINES, DEPARTMENT OF MINERALS AND ENERGY

- Monitor compliance with the Mine Health and Safety Act in the mines.
- Provide technical advice on conflict between land development and mining operations.

25 JANUARY 2000 – 30 NOVEMBER 2000

MINE SURVEYOR, TAVISTOCK COLLIERIES

05 AUGUST 1994 – 31 DECEMBER 2000

LEARNER OFFICIAL AND BURSAR, TAVISTOCK COLLIERIES

EDUCATION

FEBRUARY 2018 TO JULY 2021

MASTER OF BUSINESS ADMINISTRATION, MILPARK BUSINESS SCHOOL

- Advanced Business Research Methodology
- Business Ethics and Corporate Governance
- Business in Emerging Markets
- Business Report Writing, Quantitative Analysis and Presentation Skills
- Dissertation
- General Management Environment

- Global Trade (Macro-economic – BRICS – Developing Markets)
- Integrated Business Strategy
- Leadership and Change Management
- Management Accounting and Finance (part 1)
- Management Accounting and Finance (part 2)
- Marketing and Sales Management
- Operations and Technology Management
- People Management
- Social Responsibility and Environmental Management

JUNE 2022 TO NOVEMBER 2022
CERTIFICATE: MINE CLOSURE AND LAND REHABILITATION, UNIVERSITY OF RETORIA (UP)

- Closure Design
- Regional Planning considerations and operational mitigation
- Land preparation and soil management
- Land cover/surface stabilization-economic value
- Maintenance and land management systems
- Identifying closure planning challenges and problem areas
- Mine closure planning consideration
- Closure document required Baseline environment and closure risks
- Closure success criteria and rehabilitation monitoring
- Financial provisioning and social planning

OCTOBER 2021 TO DECEMBER 2021
CERTIFICATE: ENERGY EFFICIENCY AND SUSTAINABILITY, UNIVERSITY OF CAPE TOWN (UCT)

- Energy -importance, Strategy and Challenges
- Energy Metrics, Economics and Efficiency
- Energy-efficient and Sustainable Buildings
- Energy-efficiency management and technologies in buildings
- Energy-efficiency management and technologies in industrial sector
- Energy auditing
- Energy measurement verification and management systems

MARCH 2021 TO JULY 2021
POST GRADUATE CERTIFICATE: CLIMATE CHANGE AND ENERGY LAW, UNIVERSITY OF WITWATERSRAND

- Climate Change and Energy
- Energy Law Concepts and Economics
- Theories of Energy and Climate Regulation
- Sources of Energy: Fossil Fuels
- Sources of Energy: Petroleum Sector
- Sources of Energy: Gas Sector
- The South African Electricity Supply Industry
- Climate Change Law and Policy Framework
- Energy, Climate Change & Just Transition
- Nuclear as a Source of Electricity

- Energy Efficiency and Demand Side Management
- Regulation of Energy Procurement

OCTOBER 2014 TO JANUARY 2015
CERTIFICATE IN BASIC TRAINING FOR ENVIRONMENTAL MINERAL RESOURCE INSPECTORS, UNIVERSITY OF PRETORIA

- Constitutional Background
- NEMA and MPRDA framework legislation
- Sustainable Development
- EIA process, Scoping reports, and review of EA applications and Integrated EAs
- WASTE Act
- The Air Quality Act
- The Environmental Conservation Act
- The National Water Act
- The Integrated Coastal Management Act
- The Biodiversity Act
- The Protected Areas Act
- Administrative Law
- Criminal Enforcement
- Special forms of Liability
- Powers of Environmental Mineral Resources Inspectors-EMRI
- Ethics, Health and Safety and relevant issues
- Sampling
- Inspections
- Investigations
- Appeals
- Exemptions and exceptional circumstances

MARCH 2006 TO NOVEMBER 2008
GRADUATE DIPLOMA IN MINING ENGINEERING, UNIVERSITY OF WITWATERSRAND

- Mineral Economics
- Mineral Policy and Investment
- Compliance and Reporting Rules in the Mining Industry
- Economic Geology of South African Coal
- Coal extraction and Exploitation
- Coal and the Environment

JULY 1999 TO JULY 2000
NATIONAL HIGHER DIPLOMA, MINERAL RESOURCE MANAGEMENT, TECHNIKON WITWATERSRAND

JULY 1996 TO MAY 1999
NATIONAL DIPLOMA, MINE SURVEYING, TECHNIKON WITWATERSRAND

SKILLS

- In-depth understanding of the mining industry and its economic value chain
- In-depth understanding of the regulatory and compliance regime in the mining industry
- In-depth understanding of the value of mining in the South African and Global economy
- Good communication skills
- Conflict resolution
- Good decision making
- Ability to work under pressure.
- Time management
- Good Leadership and management

PERSONAL INFORMATION

I'm a male South African Tsonga speaking citizen, born on 29 November 1976 in Bushbuckridge, Mpumalanga Province where I started my primary schooling at Mpikaniso Primary school in 1983 and matriculated at Orhovelani High School in 1993.

I'm currently married with four children and residing in Mulbarton, Johannesburg South since June 2017 after my transfer from the Kimberly as the Regional Manager of the Northern Cape to the Johannesburg office where I also served as Regional Manager for the Gauteng Region until 30 April 2021 upon resignation.

COMMUNITY INVOLVEMENT AND PERSONAL HOBBIES

I'm currently involved in community development projects in Bushbuckridge through career guidance, cultural activities, and sport to guide the youth to focus on their vision and education goals as part of giving back to my community and assist the future generation. I have sponsored soccer kits, traditional dancing activities and motivational seminars in my village since 2009.

My personal hobbies include playing golf, watching, and following soccer, rugby, and other national sporting codes. Mentoring my kids through schoolwork and sport. I spend more time outside work with my family to groom my kids to become better citizens and leaders of the future generation.

REFERENCES

Mr Mosa Mabuza
Chief Executive Officer
Council for Geoscience
012 841 1911
082449 8650
mmabuza@geoscience.org.za

Dr Thibedi Ramontja
Former Director General: DMRE
Currently Director: School of Mining
University of Witwatersrand
083 388 9122
thibedi.ramontja@wits.ac.za /
Ramontja2@gmail.com

Dr Tania Marshall
Director: School of Mining
University of Witwatersrand
082 611 3388
marshall.tania@gmail.com

Environmental Assessment Practitioners Association of South Africa

Registration No. 2022/4485

Herewith certifies that

Sunday Mishack Mabaso

is registered as an

Environmental Assessment Practitioner

Registered in accordance with the prescribed criteria of Regulation 15. (1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Effective: 01 March 2024

Expires: 28 February 2025

Chairperson

Registrar

SAQA
SOUTH AFRICAN QUALIFICATIONS AUTHORITY

CURRICULUM VITAE

NAME	: Brunella Khanyile Mgiba-Mutero
DATE OF BIRTH	: 07 June 1995
PROFESSION/ SPECIALISATION	: Environnemental Consultant (Trainée)
	: SACNASP Student (169444)
NATIONALITY	: South African
EXPERIENCE	: 2 years
LANGUAGES	: English, Xitsonga

KEY QUALIFICATIONS

I hold a Higher Certificate in Life and Environmental Science from University of South Africa and currently enrolled for Bachelor of Arts in Environmental Management with the University of South Africa.

EXPERIENCE

[Environmental Consultant (Trainee)] [Vahlengwe Mining Advisory and Consulting]
Duties Include:

- Conduct the Environmental Impact Assessment (BAR and S&EIR) and Environmental Management Plan/Programme for prospecting, mining rights and mining permits.
- Collect application for Water Use License Applications.
- Conduct mining and environmental compliance audits and write reports thereon.
- Write the annual reports for the projects.
- To maintain a proper filing system
- To give regular updates to clients on the progress of the work being carried out on the projects.

PROJECTS EXPERIENCE

Gomeza Trading (Pty) Ltd. NC 30/5/1/1/2/ 13760 PR
Prospecting Right Application of Tin Ore, Nickel Ore, zinc Ore, Lithium Ore, Cobalt Ore and Lead in respect of the Farm Severn No.36 in the Administrative District of Kuruman, Northern Cape Province.

Khutso Naketsi Communal Property Association (CPA). NW 30/5/1/1/2/14411 PR
Prospecting Right Application of gold ore in respect of portion of portion 107 portions 108, 109, 129, 144, 179, 181, 182, 183, 184, 185, 186, 193, 194, 227, 255, 257, 258, 262, 263, 265, 273, 275, 276, 302, 308, 339, 340, 390, 993, remainder of portion 34, remainder of portion 192, remainder of portion 227, remainder of portion 272, remainder of portion 300, and remainder of portion 309 of the farm Scheerport 477 JQ, situated in the magisterial District of Brits, North-West Province.

ATNM (Pty) Ltd. GP 30/5/1/3/2/10393 MP
Application for Mine Closure Certificate for a gold ore mining permit issued in respect of portion of portion 3, farm Vlakfontein 69 IR the Magisterial district of Benoni, Gauteng Province.

CURRICULUM VITAE

Barzani Mining (Pty) Ltd. NW 30/5/1/3/2/10778 MP
Application for Mine Closure Certificate for chrome ore mining permit issued in respect of portion of portion 3, farm Tweelaagte 175 JP the Magisterial district of Mankwe, North-west Province.

Saqondisana Investment (Pty) Ltd. KZN 30/5/1/1/2/11694 PR
Prospecting right application of coal in respect of the Farm in Farm Mthembu 17538 GT, Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT, Farm Emaweni 18034 GT and Farm Uitkyk 2156 GT in the District of Estcourt District, KwaZulu-Natal Province.

ACHIEVEMENTS

- Ensure compliance monitoring and Enforcement of South African Environmental Legislations.
- Good understanding of Mineral and Petroleum Resources Development Act, National Environmental Management Act and Strategic Environmental Management Acts
- Good understanding of Environmental Impact Assessment, Waste Management and Air Quality Regulations.
- The implementation of Section 24G read with S24F and 7 of NEMA (Amendment) (Act No 8 of 2004) and Section 24G read with S24F and 12(3) of NEMA (Amendments) (Act 62 of 2008)

EDUCATION

Institution	:	University of South Africa
Qualification	:	Bachelor of Arts in Environmental Management
Status	:	In-Progress

Institution	:	University of South Africa
Qualification	:	Higher Certificate in Life and Environmental Science
Status	:	Completed

REFERENCES

Cecil Dau
Senior Consultant (Vahlengwe Mining Advisory and Consulting)
076 267 0743

Appendix 2:

Appendix 2A: Locality Map and Regulation 2(2)

LOCALITY MAP

Saqondisana Investment_PR Application

N

Ladysmith

Colenso

Site B

Site A

Legend

Site A Farms: Osaka 12977 GT, Krom Poort 2155 GT, Kaisha 14719 GT, Ravine 9201 GT and Lot MGA 8761

Site B Farm: Emaweni 18034 GT

VAHLENGWE
MINING ADVISORY
AND CONSULTING

6,2 3,1 0 6,2 12,4 18,6 24,8 Kilometers

THE FIGURE NUMBERED: A-I REPRESENT THE PROSPECTING RIGHT APPLICATION AREA IN RESPECT OF FARM OSAKA 12977 GT, KROM POORT 2155 GT, KAISHA 1471 GT, LOT MGA 8762 GT AND RAVINE 9201 GT IN THE MAGISTERIAL DISTRICT OF ESTCOURT.

FROM POINT A TO B IS ALONG THE RIVER BOUNDARY.

THE FIGURE NUMBERED: A1-K1 REPRESENTS SITE B OF THE PROSPECTING RIGHT APPLICATION AREA IN RESPECT OF FARM EMAWENI 18034 GT WITHIN THE MAGISTERIAL DISTRICT OF ESTCOURT, KWAZULULU-NATAL PROVINCE.

Name	POINT_X	POINT_Y
A	30,05431	-28,70331
B	30,13620	-28,74030
C	30,12645	-28,73875
D	30,10808	-28,74903
E	30,10615	-28,73890
F	30,07156	-28,74101
G	30,05501	-28,74586
H	30,05095	-28,74249
I	30,02772	-28,73192

Name	POINT_X	POINT_Y
A1	29,98883	-28,70759
B1	29,99216	-28,70558
C1	30,00128	-28,70968
D1	30,00092	-28,71114
E1	30,00374	-28,71318
F1	30,01110	-28,70898
G1	30,01204	-28,71292
H1	30,01785	-28,71605
I1	30,01461	-28,72543
J1	29,99979	-28,72562
K1	29,99999	-28,71555

1,2 0,6 0 1,2 2,4 3,6 4,8 Kilometers

Saqondisana Investment (Pty) Ltd

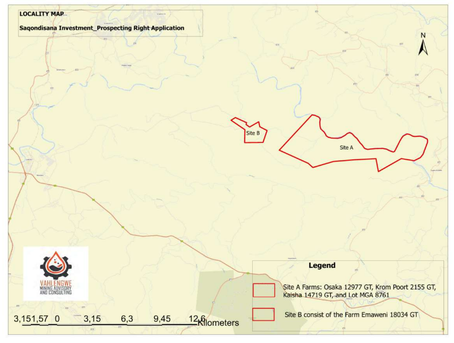
REGULATION 2 (2)
THE APPLICATION OF THE PROSPECTING RIGHT OF THE SECTION 16 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT (MPRDA) (ACT 28 OF 2002)

Application Area Extent: 2711 ha

Legend

- Points location
- Saqondisana Prospecting Right Area

Plan Approval
Applicant
Signature:.....
Date:.....
Surveyor
Signature:.....
Date:.....
Regional Manager
Signature:.....
Date:.....



PREPARED BY

VAHLENGWE MINING ADVISORY AND CONSULTING

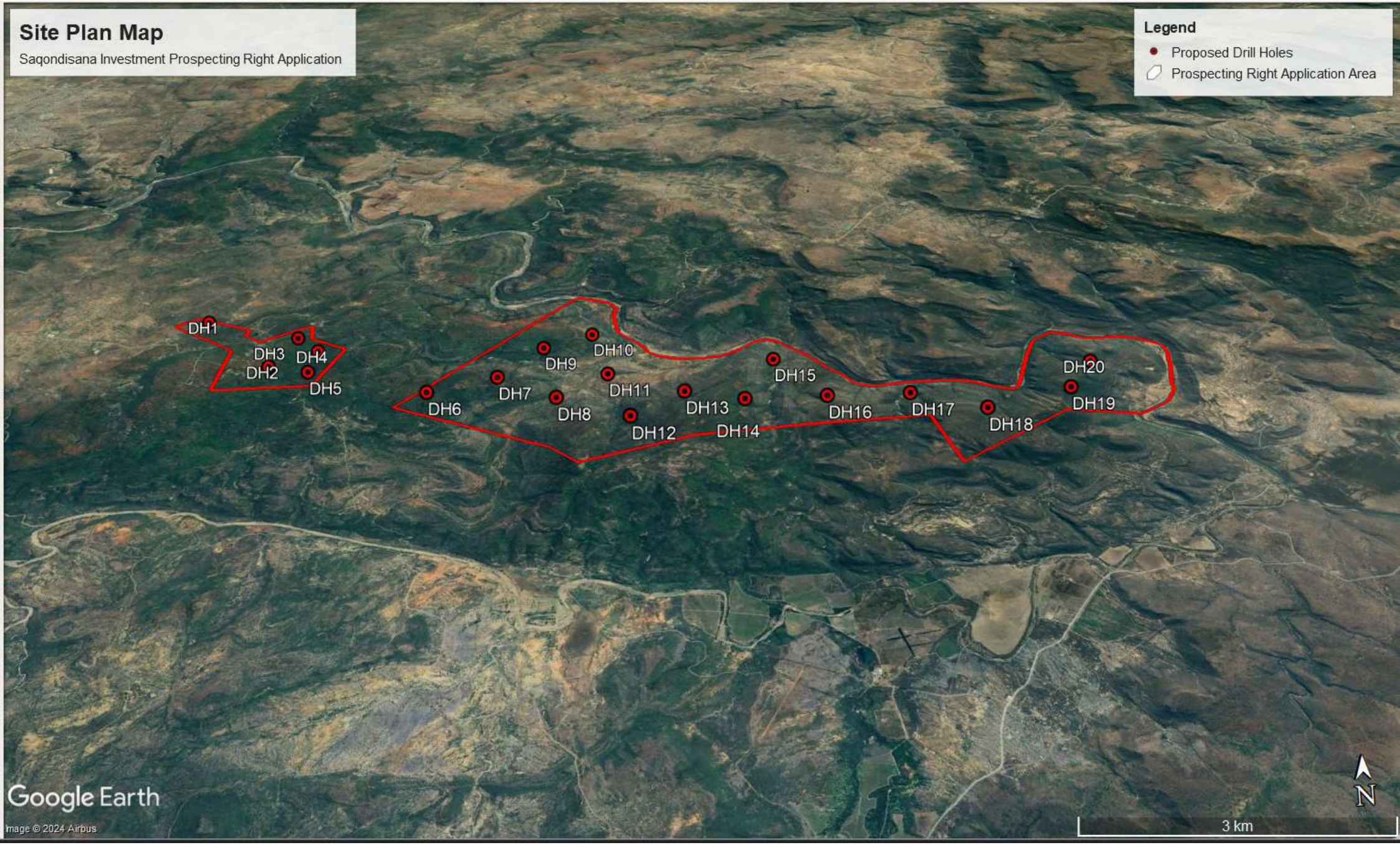
Johannesburg South	
Help Desk	Tel +27 (0) 11432 0062
230 Voster Ave Street	Tel +27 (0) 11432 0062
Glenvister 2058	Email info@vahlengweadvisory.co.za

LIABILITY CLAUSE:
This map was compiled from a variety of data sets and Vahlengwe Advisory does nor accept any responsibility for the accuracy of the data.

Coordinate System: WGS 84

Appendix 2:

Appendix 2B: Site plan Map


Site Plan Map
Saqondisana Investment Prospecting Right Application
Legend
Proposed Drill Holes
Prospecting Right Application Area
DH1
DH2
DH3
DH4
DH5
DH6
DH7
DH8
DH9
DH10
DH11
DH12
DH13
DH14
DH15
DH16
DH17
DH18
DH19
DH20
Google Earth
Image © 2024 Airbus
N
3 km

Appendix 2:

Appendix 2C: Land use Map

SAQONDISANA INVESTMENTS (PTY) LTD

Landuse Map

Legend

- Trigonometric_Beacon
- Points location
- Power_Line
- Railway_Line
- Road
- River
- Residential_Area
- Cultivation_Area

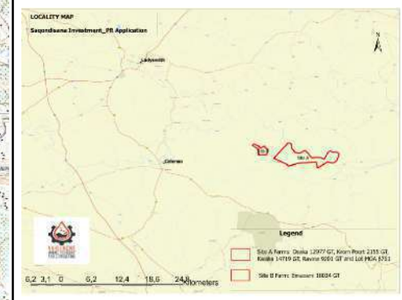
NFEPA_Wetlands

- <all other values>

NATART

- Artificial
- Estuaries
- Natural
- Prospecting Right Area

LOCALITY MAP



SCALE

1 : 50 000

CO-ORDINATE SYSTEM

N W E S

WGS84 Lo29

0 1,5 3 6 9 12 Kilometers

VAHLENGWE MINING ADVISORY AND CONSULTING

Johanessburg South
Tel: 011 432 0062
email: info@vahlengweadvisory.co.za
Address: 238 Voster Ave
street, glenvista 2058

LIABILITY CLAUSE :

This map was compiled from a variety of data sets and Vahlengwe Advisory does not accept any responsibility for the inaccuracy of the data.

Appendix 2D:

Appendix 2D: Composite Map

SAQONDISANA INVESTMENTS (PTY) LTD

Composite Map

Legend

- River_Buffer_50m
- River_Buffer_2_(100m)
- River_Buffer_3_(200m)
- wriall500_Buffer1

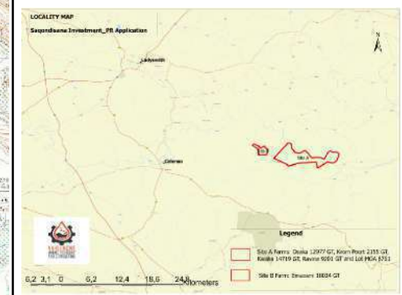
NFEPA_Wetlands

- <all other values>

NATART

-
- Artificial
- Estuaries
- Natural
- Prospecting Right Area

LOCALITY MAP



SCALE

CO-ORDINATE SYSTEM

N
W E
S

1 : 50 000

WGS84 Lo29

0 1,5 3 6 9 12 Kilometers

VAHLENGWE
MINING ADVISORY
AND CONSULTING

Johanessburg South
Tel: 011 432 0062
email: info@vahlengweadvisory.co.za
Address: 238 Voster Ave
street, glenvista 2058

LIABILITY CLAUSE :

This map was compiled from a variety of data sets and Vahlengwe Advisory does not accept any responsibility for the inaccuracy of the data.

Appendix 3:

Appendix 3A: Proof of Newspaper Advert

Ladysmith Gazette Classifieds

To advertise all your Classifieds, Legals and Service Guide contact 036-637-6801 or email your classifiedldy@dbn.caxton.co.za

0000 NOTICES

0001 COMMUNITY CARE

ALCOHOLICS ANONYMOUS

Meetings held at the Methodist Church (opp Magistrates Court). Every Wednesday from 19h30.

FOR MORE HELP/INFO Call 081 401 2051

AE002959

Animal Anti Cruelty

Should you know of any animals being abused or neglected by their owners, or if you have any donations.

Please contact PAULINE on 083 629 9569

AE002960

Cansa

Thank you for your continuous support.

For more info
Please contact Lezani 034 315 5175 or 079 860 2522

AE002961

LAFTA MEETINGS

Held every week on Wednesdays & Thursdays from 1pm to 3pm.

All seniors interested in joining, please
Contact 082 455 8548 or 036 631 3936

AE002962

0085 SOCIAL

LADYSMITH HOSPICE ASSOCIATION

We provide home based palliative care to persons suffering from life threatening illnesses. We also have equipment to hire eg wheelchairs, walkers, hospital beds and incontinence products for sale at reasonable prices.

Contact us on 036 631 2697 or 061 930 7035, 311 Murchison Street, Ladysmith

0300 SERVICES

0348 GENERAL REPAIRS

CHAINSAWS
Come and visit us for repairs, spares & sales at Livingston Lawnmower Services -
401 Murchison Street, Ladysmith
PHONE: 0366375212

AE002874

0358 LAWNMOWER SERVICES

LAWNMOWERS
Sales, Repairs & Spares. Livingston Lawnmower Services.
401 Murchison St - Ladysmith
PHONE: 036 6375212

AE002873

LOST OR DESTROYED DEED

Notice is hereby given in terms of Regulation 68 of the Deeds Registries Act, 1937, of the intention to apply for the issue of a certified copy of Mortgage Bond Number B593/1996 passed by FREDERICK JACOBUS KRUGER Identity number 640309 5117 08 1 and MARINA SUNEEN KRUGER Identity number 650818 0015 08 9
Married in Community of Property to each other
in favour of
THE STANDARD BANK OF SOUTH AFRICA LIMITED

Registration Number 1962/000738/06
in respect of a certain REMAINDER OF ERF 512 LADYSMITH
REGISTRATION DIVISION GS PROVINCE OF KWAZULU-NATAL
IN EXTENT 1628 (ONE THOUSAND SIX HUNDRED AND TWENTY EIGHT) SQUARE METRES
which has been lost or destroyed.
All persons having objection to the issue of such copy are hereby required to lodge the same in writing with the Registrar of Deeds at PIETERMARITZBURG within 2 (two) weeks after the date of the publication of this notice.
Dated at LADYSMITH this 3RD day of SEPTEMBER 2024

For: APPLICANTS:
Christopher, Walton & Tatham
133 Murchison Street
Ladysmith, 3370
TEL: (036) 637 6741
Email: anagoor@cwt.co.za
REF: IWG/AN/MAT1116713

ESTATE NOTICE

In the estate of the late **BHEKI RONALD WESLEY DUBE,** Masters Ref. No. 008015/2022/PMB, Identity number 5807175840084 married in community of property to NTOMBENHLE MURIEL DUBE, Identity Number 6405260707083, who died on the 18TH June 2022.

Creditors and Debtors in the above estate are hereby called to file their claims with and to pay their indebtedness to the undersigned within a period of thirty (30) days as from the date of publication hereof.

Dated at Ladysmith on this 15th day of AUGUST 2024.

MACAULAY & RIDDELL
126 MURCHISON STREET
P. O. BOX 107
LADYSMITH
3370
(REF. JHM/nb/GD2063)

First and Final Liquidation and Distribution Account in the Deceased Estate lying for Inspection

ESTATE NUMBER: 4477/2023

In terms of section 35(4) and (5) of Act 66 of 1965, Notice is hereby given that copies of the First and Final Liquidation and Distribution Account in the Estate of the LATE THEMBINKOSI VINCENT THWALA, IDENTITY NUMBER 650317 5238 08 5, who died at LADYSMITH on the 05 MAY 2023 and who was married In Community of Property to NTOMBIZANDILE HAPPINESS THWALA, IDENTITY NUMBER 781222 0686 08 4, of 28 INHLABA STREET, LADYSMITH, 3370, will lie open for inspection for all persons with an interest therein at the Magistrates Court, Ladysmith and at the offices of the Master of the High Court, Pietermaritzburg, for a period of twenty one (21) days from the date of publication hereof.

Should no objection thereto be lodged with the Master concerned during the specified period, the executors will proceed to make payments in accordance with the accounts.

Attorneys for Executor
ATTORNEYS FAROUK KHAN
64 CONVENT ROAD
P.O BOX 4111
LADYSMITH
3370
REF: MR KHAN / SHAINAZ

SAQONDISANA INVESTMENT (PTY) LTD

NOTICE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCESS
INVITATION TO REGISTER AS AN INTERESTED AND AFFECTED PARTY AND COMMENT ON THE DRAFT BASIC ASSESSMENT REPORT.

NOTICE OF ENVIRONMENTAL AUTHORISATION FOR THE PROSPECTING RIGHT APPLICATION OF COAL IN RESPECT OF FARM LOTMGA 8761 GT, FARM KAISHA 14719 GT, FARM OSAKA 12977 GT, FARM KROM POORT 2155 GT AND FARM RAVINE 9201 GT IN THE ESTCOURT DISTRICT, KWAZULU-NATAL PROVINCE.

DMR REFERENCE NO.: KZN 30/5/1/1/2/ 11694 PR

Notice is hereby given in the intent to conduct Environmental Authorization process for an application of a prospecting right of coal, for Saqondisana Investment (Pty) Ltd in terms of National Environmental Management Act - NEMA (Act 107 of 1998) as amended, and the Environmental Impact Assessment (EIA) Regulations, 2014. Notification is hereby given to all Interested and Affected Parties (I&APs) in terms of Section 39 to 44 of GNR 982 (as amended). The EIA process would be undertaken in terms of these guidelines and to be submitted to the Competent Authority Department of Mineral Resources and Energy (DMRE).

THE ABOVE ACTIVITIES TRIGGERS:
Activity 20 of GN R 983 (as amended): 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, as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the prospecting right.

PROPOSED SITE LOCATION.
The proposed project is situated in the Estcourt District of KwaZulu-Natal Province, 36,63 km East south of Ladysmith town and 29,60 km East south of Umbulwana Village and access road to the farm is via the R74 road.

PUBLIC MEETING:
Public meeting will be held to facilitate discussions on the Draft Basic Assessment Report to obtain comments and inputs from the Interested and Affected Parties (I&APs), therefore you are requested to register your names as I&AP within 15 days, thus, on/before **20th September 2024**. You are further requested to submit your comments within 30 days from the date this notice was published. Take note that your comments must be submitted on or before the **05th of October 2024** to the details below:

Consultant	: Vahlengwe Mining Advisory and Consulting
Contact person	: Sunday Mabaso
Postal address	: 238 Voster Ave, Glenvista Extension 3, Johannesburg South, 2058
Contact	: +27 11 432 0062
E-mail	: info@vahlengweadvisory.co.za

Address: 238 Voster Avenue, Glenvista, 2058
Tel: +27 11 432 0062
E-mail: info@vahlengweadvisory.co.za

SERVICE Guide

ACCOUNTANTS

Lee Oosthuizen
Chartered Accountants (S.A.)
REGISTERED ACCOUNTANTS & AUDITORS
Tax Specialist
Tel: 036 637 2161 - Fax: 036 631 1510
Email: audit@lee-oos.co.za | tax@lee-oos.co.za
50 Francis Road / P.O. Box 491
Ladysmith, 3370

AUDIOLOGIST

Are you battling with
Hearing loss?
Karen Pillay Audiologist
M-Aud (UKZN) (PR NO: 0323551)
Services Offered:
*Hearing Tests *Hearing Aid Fittings
*Newborn hearing screening *Vertigo/ Dizziness Testing
Suite 13, La Verna Hospital, Ladysmith - Tel: 036 631 0685
Estcourt Medical Centre Tel: 036 352 2588
Email: info@kpaudioinc.co.za

ELECTRICAL SPECIALIST

Teslah
SOLAR SYSTEMS
Contact: 083 631 2110

EMBROIDERY & SAFETY WEAR

VIKILOG
TOUGH STUFF
INDUSTRIAL EMBROIDERY, SCREENPRINTING SAFETY WEAR & MORE
074 965 6433
063 549 3696
28b Bloukrans Road, Ladysmith

FUNERAL SERVICES

Ladysmith Funeral Home
- Burials - Cremations - Funeral Policies
- All funeral requirements - 24 hours
Linda: 082 685 0373
Allan: 083 785 0405
3 Poort Road Ladysmith

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Willie Fourie - Cell: 083 455 8913
Sandra Fourie - Cell: 083 3100 350

KEY SHOP

THE KEY SHOP
-Locksmith
-Key Cutting
-Car Keys & Programming
- All Household Detergents
Game Centre, Ladysmith, 3370
Contact: Allan 083 785 0405
Locksmith : 083 785 0405

PRINT & SIGNS

Simon Signs
High Quality Digital Prints
Vehicle Signs - Licence Disks
Shop Front & Contravision
Birthday & Promo Banners
XL Photo Enlargements
Custom Canvas & Wall Decor
10 Castle Road ○ 072 861 0554

Appendix 3:

Appendix 3B: Site notice report

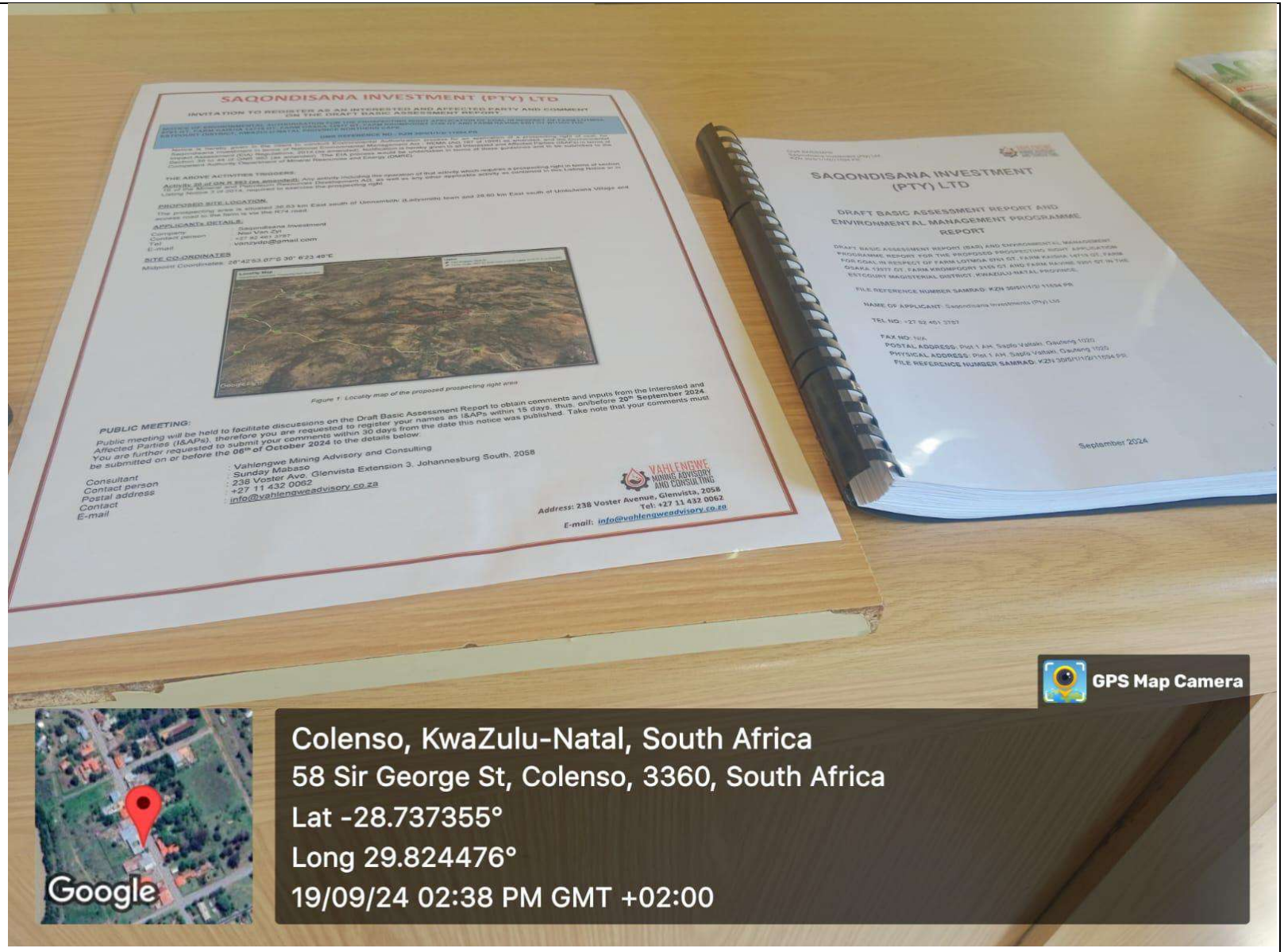
SITE NOTICE REPORT

Basic assessment for an application of prospecting right for coal in respect of the Farm in Farm Mthembu 17538 GT, Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT, Farm Emaweni 18034 GT and Farm Uitkyk 2156 GT in the District of Estcourt District, KwaZulu-Natal Province. The prospecting area is situated 36,63 km East south of Ladysmith town and 29,60 km East south of Umbulwana Village and access road to the farm is via the R74 road.

Site notices were distributed at various areas at the uThukela District Municipality, Inkosi Langalibalele local Municipality (at the Emaweni ranch, boundary of farm, the local tuckshop and the tribal office) on the 19th of September 2024.

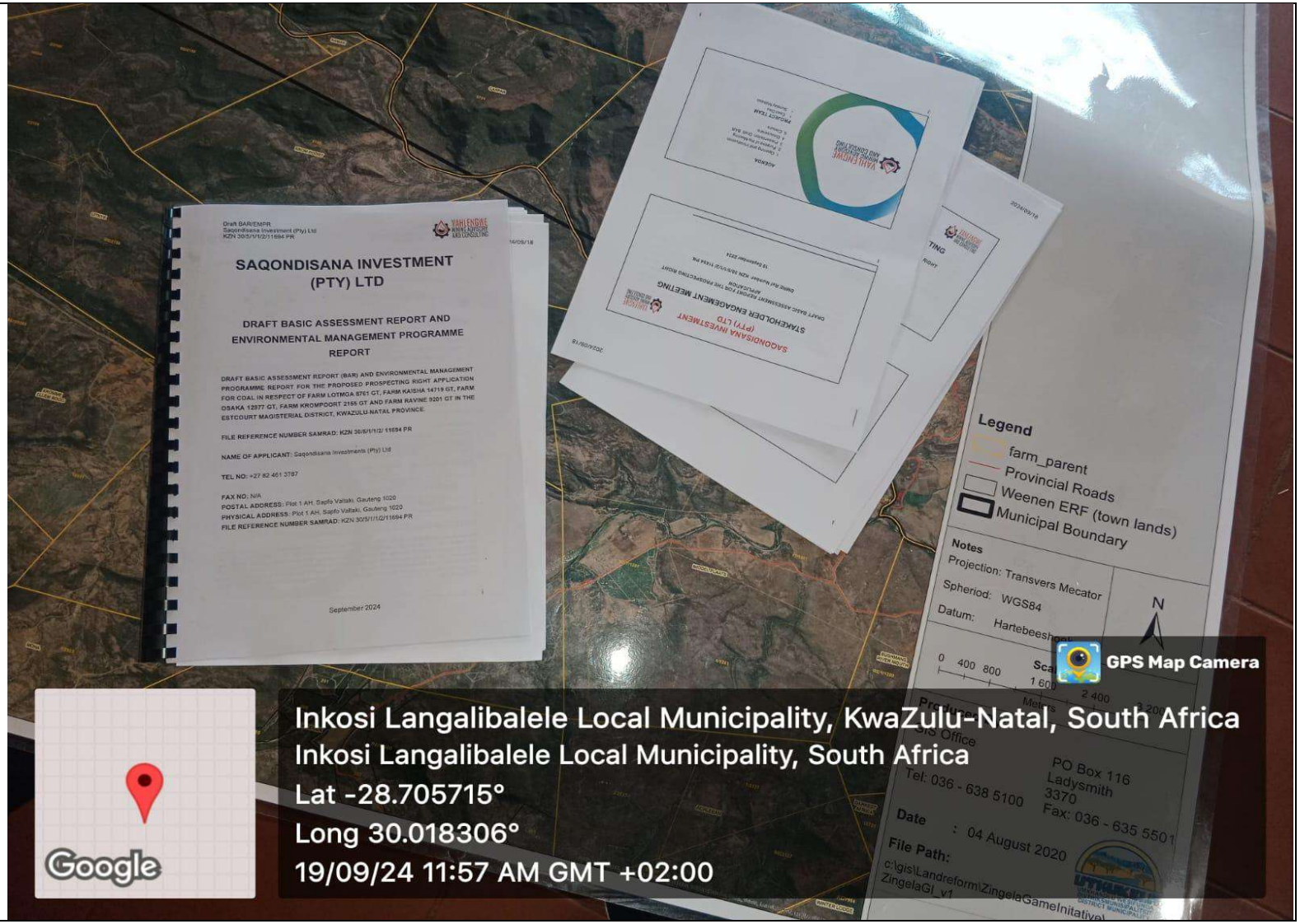
Site notice A was placed at the boundary of farm site where the proposed project will be undertaken.	

Site notice B was placed at the local Tuckshop	

Site notice C was placed at Colenso	

Stakeholder engagement meeting at Emaweni ranch	


GPS Map Camera
uThukela District Municipality, KwaZulu-Natal, South Africa
Unnamed Road, South Africa
Lat -28.709517°
Long 29.969122°
19/09/24 12:48 PM GMT +02:00
Google

Draft BAR and Presentation for the stakeholder engagement meeting at inkosi Langalibalele local municipality	

Site Notice D at the municipal notice board	

Appendix 3:

Appendix 3C: BID and I&AP registration form

BACKGROUND INFORMATION DOCUMENT FOR THE ENVIRONMENTAL AUTHORIZATION: PROSPECTING RIGHT APPLICATION.

ENVIRONMENTAL AUTHORISATION FOR THE PROSPECTING RIGHT APPLICATION OF COAL IN RESPECT OF FARM LOTMGA 8761 GT, FARM KAISHA 14719 GT, FARM OSAKA 12977 GT, FARM KROMPOORT 2155 GT, FARM EMAWENI 18034 GT AND FARM RAVINE 9201 GT IN THE ESTCOURT DISTRICT, KWAZULU-NATAL PROVINCE.

DMRE REFERENCE NO.: KZN 30/5/1/1/2/ 11694 PR

PURPOSE OF THIS DOCUMENT

This Background Information Document (BID) has been prepared as part of the notification and consultation process required in terms of the National Environmental Management Act (NEMA) (Act 107 of 1998). It describes the following:

- Background information regarding the proposed project;
- Information about the site and the proposal being considered;
- Public participation process; and
- Suggestions on how the stakeholders including the I&APs can participate on the process.

APPOINTED OF ENVIRONMENTAL ASSESSMENT PRACTITIONERS

Vahlengwe Mining Advisory and Consulting as an Environmental Assessment Practitioner (EAP) will conduct Environmental Authorization process for the prospecting right application for coal prospecting activities in respect of Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT, Fram Emaweni 18034 GT and Farm Ravine 9201 GT in the District of Estcourt District, KwaZulu-Natal Province, for an extent area of is 2718.14 ha

PROJECTION LOCATION

The prospecting area is situated 36,63 km North east of Ladysmith town and access road to the farm is via the R74 road. Estcourt Town is located in Alfred Duma, Thukela District Municipality, KwaZulu-Natal Province.

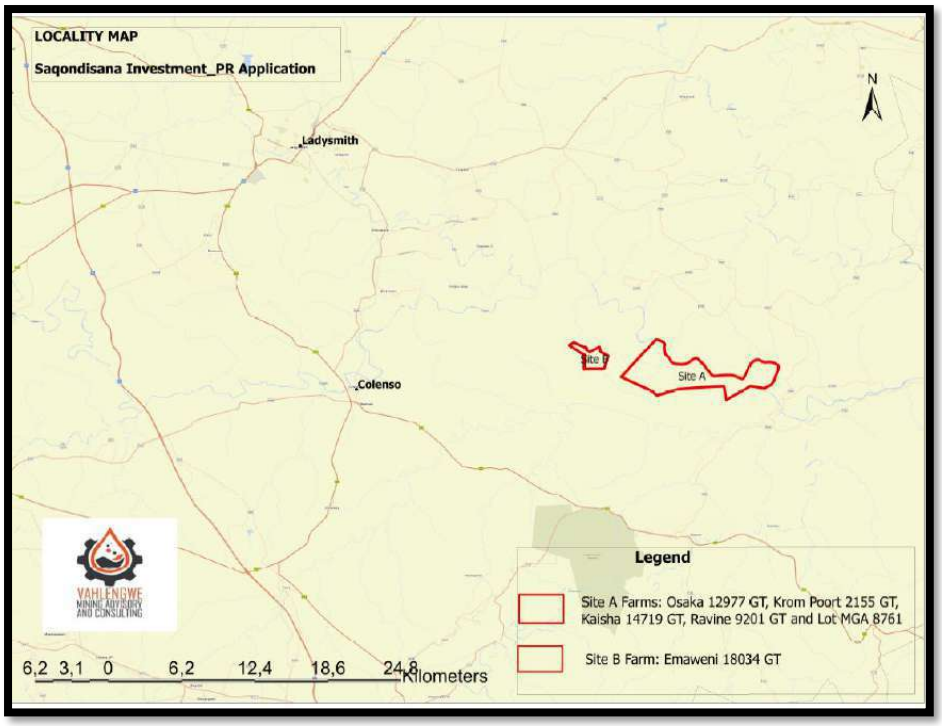


Figure 1: Locality Map of the proposed area

PROJECT DESCRIPTION

Saqondisana proposes to undertake coal prospecting activities in respect of Portions 1,2,4, and 5 Situated in the Farm Mthembu 17538 GT, Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT, Farm Emaweni 18034 GT and Farm Ravine 9201 GT. In the District of Estcourt, KwaZulu-Natal Province. The project entails the drilling of about twenty (20) boreholes to determine the mineral deposition, quantity, economic viability, and possibilities of the project leading to a viable mine. Vahlengwe Mining Advisory and Consulting (Pty) Ltd will compile the Basic Assessment and Environmental Management Programme for the Prospecting Right Application and facilitate the PPP.

PUBLIC PARTICIPATION PROCESS.

The purpose of public consultation process is to enable landowners, lawful occupiers, directly affected individuals, and/or other Interested and Affected Parties (I&APs) to raise any issues, concerns and or comments regarding the prospecting activities. A proof of consultation report will be developed and submitted to the Department of Mineral Resources and Energy (DMRE). The proposed project requires Environmental

Impact Assessment process in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (as amended).

Following step will be followed while conducting public participation.

- Issuing of notification of this project to:
  - Owners and occupiers of the farms as well as those adjacent to the site
  - Municipal Councillor
  - The municipality which has jurisdiction, and any organ of state having jurisdiction
- Placing an advert in a local newspaper
- Placing a notice on the site notice
- Meetings with landowners and key I&APs, as required
- Public review of Basic Assessment Report and Environmental Management Programme

PUBLIC INVOLVEMENT

Public involvement is an essential component of the process. It addresses the right of Interested and affected Parties (I&APs) to be informed of the proposed activities.

All Interested and Affected parties (I&APs) are invited to submit their issues, concerns, and comments regarding the proposed prospecting activities to Saqondisana Investment via email, registered post or telephonically. The Interested and Affected parties (I&APS) Form is made available below for you to fill in your personal details and comments, kindly do so and submit it back to us.

HOW TO OBTAIN FURTHER INFORMATION.

Registering as I&APs will ensure that you are placed on a database to be informed of any progress regarding the project. You can do so by filling in the form below and return it to the relevant person listed below.

We encourage the I&APs to review the information presented to you in this Background Information Document (BID) and to register as an I&AP for the attached respondent sheet and return it to us.

PUBLIC CONSULTATION CONTACTS:

Name: : Sunday Mabaso
Postal address : 238 Voster Ave, Glenvista Ext 3, Glenvista, 2058
Contact : +27 11 432 0062
E-mail : info@vahlengweadvisory.co.za

APPLICANT CONTACTS

Name : Niel Van Zyl
Postal Address : Plot 1 AH, Sapfo Valtaki, Gauteng 1020
Tel : +27 82 461 3787
E-mail : vanzydp@gmail.com

SAQONDISANA INVESTMENTS (PTY) LTD

Interested & Affected Party Registration Form

Project Reference No.: KZN 30/5/1/1/2/11694 PR

Name and Surname	
Physical Address	
Contact Details	***Telephone No.:*** ***Fax No.:*** ***Cell No. :*** ***E-mail Address:***
Please indicate any issues, comments and concerns with regard to the proposed project	
Please indicate in which aspects you would require more information	
Please indicate any I&APs whom you think should be contacted	
To be registered as an I&AP for this project mail, or e-mail the completed registration form to: **Sunday M Mabaso** **Postal address: 238 Voster Ave, Glenvista Ext 3, Glenvista, 2058** **Contact : +27 11 432 0062** **E-mail : info@vahlengweadvisory.co.za**	

VAHLENGWE MINING ADVISORY AND CONSULTING

Appendix 3:

Appendix 3D: I&AP database

Interested and Affected Party database

NAME AND SURNAME	ORGANIZATION/ COMMUNITY	ADDRESS	CONTACT DETAILS	EMAIL ADDRESS
STATE ORGANS				
Reddy J	DWS			
Gugu Mazibuko	uThukela District Municipality			
Mmatlala Rabothatha	DFFE			
Lindiwe Dlamini	DFFE			
Nompumelelo	DFFE			
Dominic Wieners	Ezemvelo Wildlife			
STAKEHOLDERS				
Mzwakhe Zungu	Alfred Duma Municipality			
Wandile Khoza	Alfred Duma Municipality			
Zulu Mfikiseni				
Mabuyi Mkhize				
Mpaili ngcongo	Gannahoek			
Nkosi Mthembu	King Mthembu			
Mabiya Mveze	Gannahoek			
Sithongwa Miya	Gannahoek			
Mlungisi Mvelase	Gannahoek			
Zamani Miya	Maweni			

Appendix 3:

Appendix 3E: Public participation process

SAQONDISANA INVESTMENT (PTY) LTD

VAHLENGWE MINING ADVISORY AND CONSULTING

STAKEHOLDER ENGAGEMENT MEETING

DRAFT BASIC ASSESSMENT REPORT FOR THE PROSPECTING RIGHT APPLICATION

DMRE Ref Number: KZN 30/5/1/1/2/ 11694 PR

19 September 2024

VAHLENGWE MINING ADVISORY AND CONSULTING

AGENDA

1. Opening and Introduction
2. Purpose of the Meeting
3. Presentation: Draft BAR
4. Discussions
5. Closure

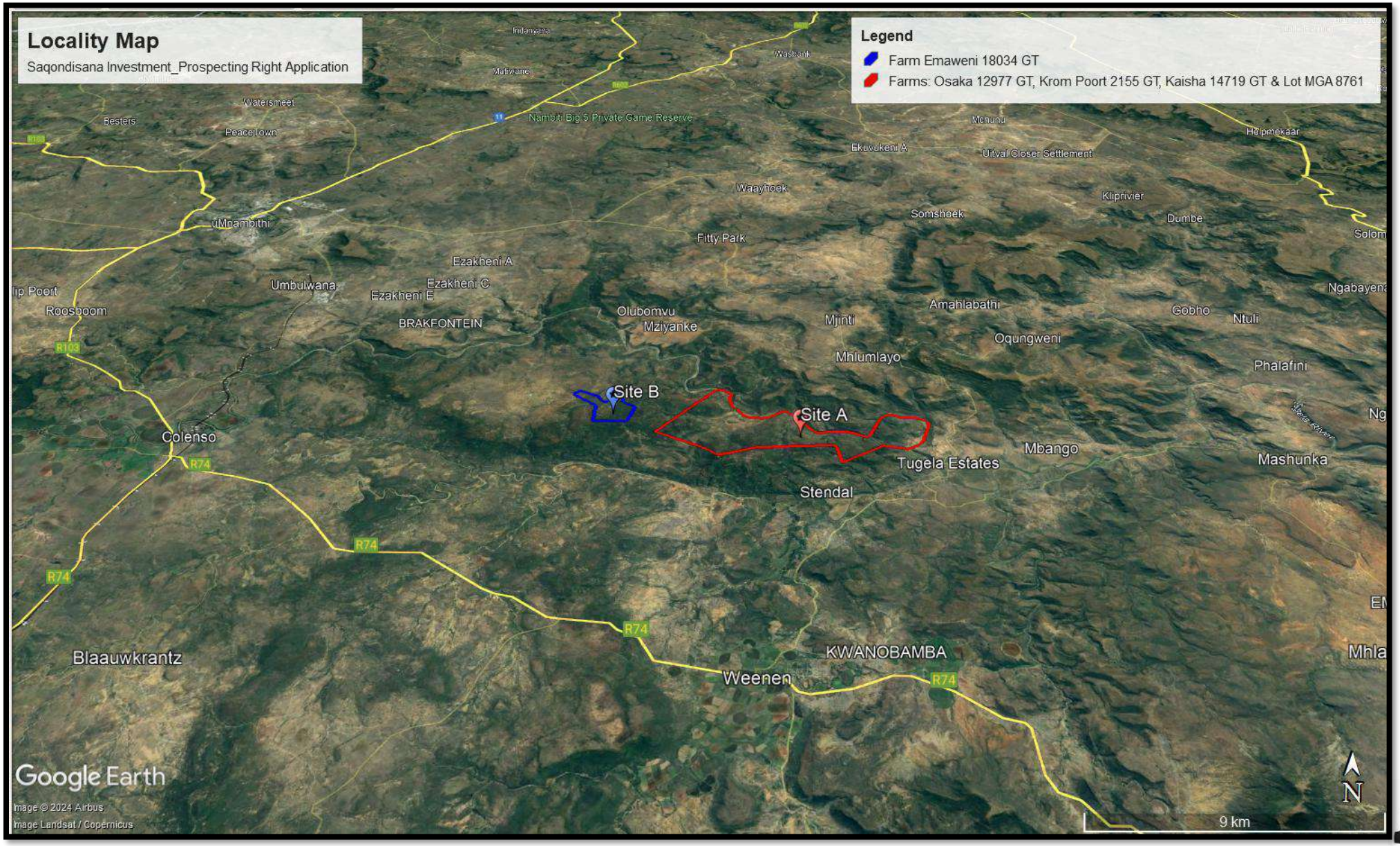
PROJECT TEAM

- Cecil Dau
- Sunday Mabaso

INTRODUCTION

- Saqondisana Investment (Pty) Ltd has applied for a **prospecting right** in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (as amended) (MPRDA).
- Application has been accepted by DMRE(Kwazulu-Natal) Regional Office under the reference number **KZN 30/5/1/1/2/ 11694 PR**
- Mineral applied for**: Coal**
- **Locality:** Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT and Farm Ravine 9201 GT in the Magisterial District of Estcourt District, KwaZulu-Natal Province
- The area covers an area extent of **2718.14 ha**
- **Current Land uses:** residential and commercial farming.

VAHLENGWE MINING ADVISORY AND CONSULTING



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REGULATORY FRAMEWORK

- **Application:** Prospecting right in terms of Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (as amended) (MPRDA).
- **Environmental Authorization** in terms of Sec. 24 of NEMA, 1998 (Act 107 of 1998)(as amended).
- **GN R 983 (Listing Notice No. 1); Activity 20:** 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).

PROJECT DESCRIPTION: ACTIVITIES

- Prospecting activities will be divided into **non-invasive activities** and **invasive activities**.
- **Non-invasive activities:** desktop studies,geophysical surveys, remote sensing geological mapping, environmental and rehabilitation studies and banking and feasibility studies
- **Invasive activities:**
  - Site establishment – vegetation clearance of an extent area of 30m x 30m
  - Installation of ablution facilities
  - Construction of temporal access roads
  - **Drilling of 20 boreholes** with a diameter of 165mm at a depth of 200m .
  - **Sample Analysis**: Core logs will be collected and analysed at the laboratory
  - **Rehabilitation:** Boreholes to be capped at 1.5m below surface and covered with topsoil.

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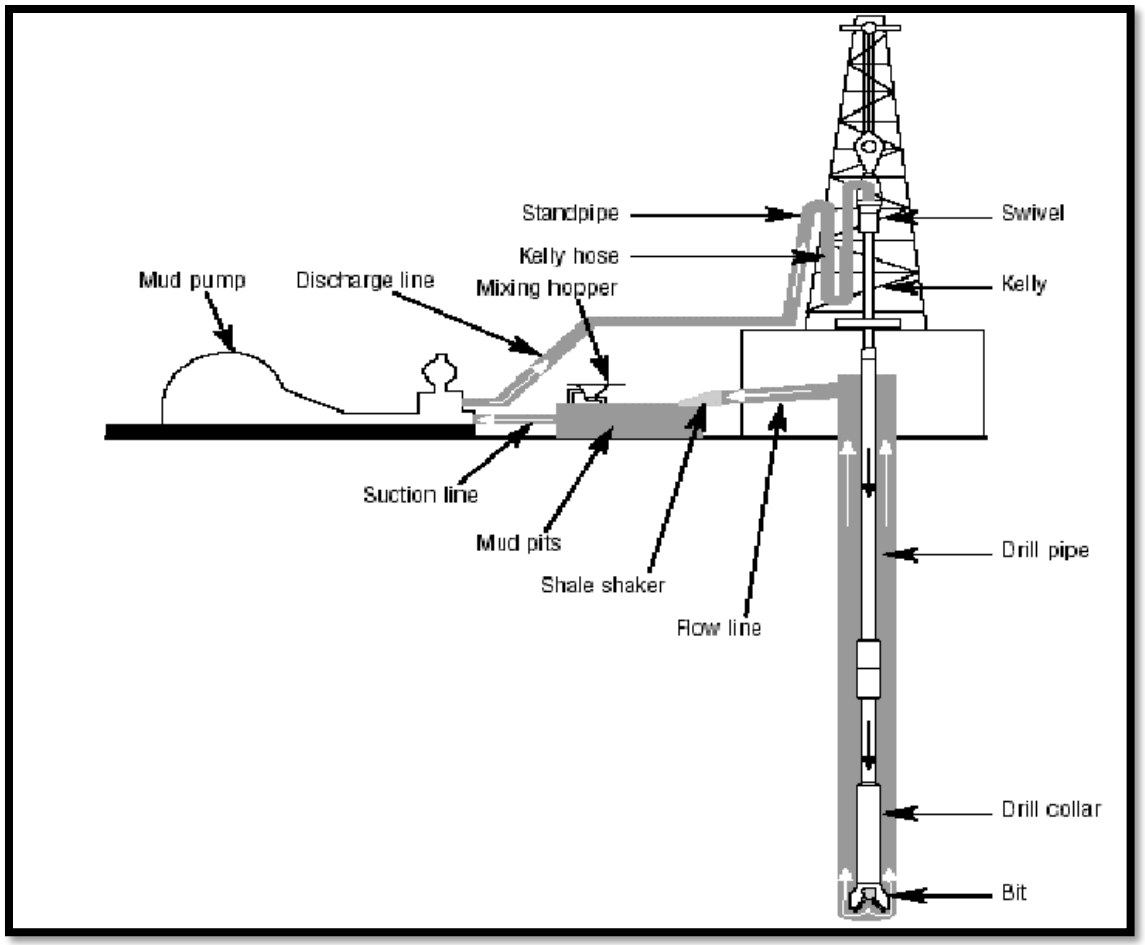
LOGS AND DRILLS

Drill Rig



Clay Core Logs

PUBLIC PARTICIPATION PROCESS (PPP)

- Draft Basic Assessment Report : Subjected to a 30-day Public Participation Process.
- The purpose of public consultation process is to enable landowners or lawful occupiers of the land and stakeholders including the Interested and Affected Parties (I&APS) to raise any issues, concerns and or comments regarding the prospecting activities.
- A Comments and Response Report (CRR) will be developed and incorporated into the final Basic Assessment Report to be submitted to the Department of Mineral Resources and Energy (DMRE) for decision making.

Announcement of the Draft Scoping And PPP To Be Followed

- Availability of the Draft Basic Assessment Report from the 08th July 2024;
- A Background Information Document (BID) including a registration form handed and distributed to the identified I&AP;
- Site notices placed at the project site and at strategic locations visible to the public;
- Newspaper advertisement on Ladysmith Gazette Newspaper on the 06th September 2024;
- A stakeholder engagement meeting on the 19th of September 2024;
- A public participation meeting; and
- An electronic copy on the 06th September 2024. (www.vahlengweadvisory.co.za).

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Specialist Studies to be undertaken during the EIA Phase

- Heritage Impact Assessment;
- Ecological and Wetland Impact Assessment; and
- Heritage Investigation (Floodline Delineation) Impact Assessment

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Potential Impacts Summary (Negative)

Environmental Aspects	Potential Impacts	Management and Mitigation Measures
Soils and Land Capability	Soil Compaction and contamination	Concurrent rehabilitation; and A clean-up of hydrocarbon spills
Flora & Fauna	Alteration of ecological life cycle	Minimising disturbance on the indigenous vegetation; and Environmental awareness and training for workers
Surface and Groundwater resources	Contamination of water resources and deterioration of water quality	Adequate stormwater management must be incorporated into the design of the project.
Air Quality/Dust; and Noise	Dust generation and ambient air pollution; and Ambient noise levels increase	Conduct dust fall-out monitoring; and Vehicle maintenance ; and Operation must be restricted to the specific hours
Visual	Visual disturbance	Rehabilitation of drilling sites
Cultural and Heritage Resources	Degradation of sites of cultural and heritage significance	Conduct Identification of all possible sites of archaeological value prior to the commencement of authorised work; and Identified sites must be clearly demarcated as no-go areas.
Traffic	Increase in traffic volumes on existing traffic network	Local speed limits and traffic laws shall always apply

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Potential Impacts Summary (Positive)

Environmental Aspects	Potential Impacts	Management and Mitigation Measures
Socio-economic	Creation of temporary employment; and Opportunities to local people	Skills development and transfer; and Maximise procurement of goods and services from local providers Community development as part of the Social and Labour Plan (SLP), should the prospecting project transition to mining.

CONCLUSIONS

- The project is anticipated to have several positive impacts on the surrounding community, including the generation of employment opportunities for local residents, economic contributions, and the potential transfer of skills, training, and opportunities should the project progress to mining.
- Environmental impacts identified during the preliminary assessment can be significantly reduced through the implementation of the proposed mitigation and management measures.
- Therefore, project activities have to be monitored to achieve anticipated rehabilitation goals.

VAHLENGWE MINING ADVISORY AND CONSULTING

Thank you!
Discussion

VAHLENGWE
MINING ADVISORY
AND CONSULTING

011 432 0062
info@vahlengweadvisory.co.za
www.vahlengweadvisory.co.za
238 Vorster Avenue, Glenvista Ext 5, Johannesburg South. 2091

STAKEHOLDER MEETING MINUTES

PUBLIC PARTICIPATION PROCESS OF AN APPLICATION FOR ENVIRONMENTAL AUTHORISATION FOR A PROSPECTING RIGHT FOR COAL TO CONSULT DRAFT BASIC ASSESSMENT REPORT IN TERMS OF REGULATION 41- 44 OF THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATION, 2014 (AS AMENDED) READ WITH THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT,1998 (ACT 107 OF 1998) (AS AMENDED) IN RESPECT OF THE FARM EMAWENI 18034 GT, OSAKA 12977 GT, KAISHA 14719 GT, LOT MGA 8761 GT, KROM POORT 2155 GT OF AND FARM RAVINE 9201 GT: SITUATED IN THE MAGISTERIAL DISTRICT OF UTHUKELA, KWAZULU-NATAL PROVINCE.

Date:	04 September 2024
Company:	Saqondisana Investments (Pty) Ltd, DMRE Ref No: KZN 30/5/1/1/2/ 11694 PR
Venue:	Vahlengwe offices
Time:	10:00 am – 10:45 pm

MEETING AGENDA

1.Opening and Introduction

2.purpose of the meeting

3.Presentattion: Draft Basic Assessment Report

4.Discussions

5.Closure

1. OPENING AND INTRODUCTION

Mr. Sunday Mabaso explained that Vahlengwe Mining advisory and consulting is an Independent Environmental Assessment Practitioners (EAP)(consultant) appointed by Saqondisana Investments (Pty) Ltd “the applicant” in terms of regulation 12 of the Environmental Impact Assessment Regulation, 2014 to facilitate an application for an Environmental Authorisation (EA) for a prospecting right.

2. PURPOSE OF THE MEETING

Mr. Sunday Mabaso explained that the purpose of the meeting with the ward councillor was because Saqondisana Investment applied for a prospecting right simultaneously Environmental Authorisation (EA) for coal, as a result, they are required to appoint an independent EAP to facilitate the EA application and follow proper process, and conduct Public Participation Process (PPP) which requires placing site notices on public areas, advertising on the local newspaper and a public meeting to be held before October 06, 2024 to consult the draft Basic Assessment Report (DBAR) and provide stakeholders, landowners, land occupiers, as well as Interested and Affected Parties (I&APs) with sufficient information about the proposed prospecting project, as well as provide them an opportunity to comment, raise concerns, and to contribute towards the process. Mr Mabaso stated that we need the ward councillor, as a stakeholder in the community to assist with protocol to arrange a public meeting and to mobilise as well as a guide on whom to engage, and further explained that he needed them to better understand the project prior to the meeting.

3. PRESENTATION

Mr. Mabaso gave a brief background of the application to the stakeholders.

4. DISCUSSIONS (Q &A)

After the brief background, the discussion progressed to an interactive session in which the stakeholders were given an opportunity to ask questions, make comments, and express their opinions, concerns for incorporation in the proposed prospecting application.

NAME OF THE PARTICIPANT	COMMENTS/ISSUES	RESPONSES
Cllr Zungu	I've already provided contact details for the chieftaincy (Mthembu), as you'll need their blessings to progress so that the councillor can mobilise and arrange the meeting.	**Sunday Mabaso** The applicant has already spoken with the king, who has indicated that we can meet with the ward councillor, but if we need him to interfere, we will contact him so

		that we do not mix up protocols, but I'm relieved now that we know the protocol. We will notify the client that you advised that we should communicate with the chief.
	I see the red boundary to understand who the adjacent communities are?	**Cecil Dau** The communities on the boundary are Kokwane, Maweni and Tugela Estates.
Mulalo Mafunisa	Does this area fall within your jurisdiction or the same ward?	Cllr Zungu Kokwane and Tugeka Estates are within my ward 37, while the community within the project boundary falls under ward 29 of Inkosi Langalibalele.
Sunday Mabaso	Do you mind to giving us the kings number?	Cllr Zungu I gave you his child's phone number, you will get the king's number from there.
Cllr Zungu	Who is the applicant and where are they from?	Sunday Mabaso Niel van Zyl is the applicant, he is based in Bronkhorstspruit, we will come with him when we come for public participation, but if cannot make it, the company will send a representative.
Sunday Mabaso	We request to provide you the full pack to paste on your side of the ward as well as on the other ward. Do you have schools or clinics in your area? place the Basic Assessment Report consisting of all information pertaining to the project in the library and/or tribal.	Cllr Zungu Yes, we do have but we'll have to go via the king for pasting, therefore I can only drop it at the king for their further distribution.

5. CLOSURE.

At 10:45, Mr Mabaso adjourned the meeting, thanking the ward councillor for the meeting and assisting with the Public Participation Process.

Saqonisana Kzn11694PR

VAHLENGWE MINING ADVISORY AND CONSULTING

info@vahlengweadvisory.co.za

Stakeholder Engagement

Venue: Colenso – Ganna Hoek settlement **Date:** 19/09/2024

Name & Surname	Organisation and Position	Tel/Cell Number	Email address	Signature
Mabuyi MKhize				
Nkosi Mthembu	KING Mthembu			
MFIKILI NGONGO	Ganna Hoek			
Mabhiya Mveze	Gannahoek			
Sithokozwa Miya	Gannahoek			
Mlungisi Mvelase	Gannahoek			
Zamani Miya	Maweni			

Saqonisana Kzn11694PR

VAHLENGWE MINING ADVISORY AND CONSULTING

info@vahlengweadvisory.co.za

Name & Surname	Organisation and Position	Tel/Cell Number	Email address	Signature
Niel van Zyl.	Saqonisana Director			
CECIL DAY	Vahlengwe			
Sunday Mabaso	Vahlengwe			

VAHLENGWE
MINING ADVISORY
AND CONSULTING
Address: 238 Voster Ave,
Glenvista, 2058
Tel: +27 11 432 0062
E-mail: info@vahlengweadvisory.co.za

ATTENDANCE REGISTER

Date:04 SEPTEMBER 2024 Time: 12:30 PM

Venue: Vahlengwe Mining Advisory and Consulting_ Glenvista Extension 3

Purpose: Meeting with a councillor_ Saqondisana Investment (Pty) Ltd

NAME AND SURNAME	COMPANY	EMAIL	CONTACT NUMBER	SIGNATURE
Khanyile Mgiba	Vahlengwe			
Cecil Dau	Vahlengwe			
Zulu mFikiseni	S.			
Mzwakhe Zwane	Alfred duma local municipal			
Wandile Khoza	AFRed duma			
Sunday Mabaso	Vahlengwe Consult			
Mulalo Mafunisa	Vahlengwe Consultant			
Dimakatso Leholi	Vahlengwe			
KM. Mmolotsi	Vahlengwe			

Appendix 3:

Appendix 3F: Comments and Response Report (CRR)

SAQONDISANA INVESTMENT (PTY) LTD

COMMENTS AND RESPONSE REPORT:

BASIC ASSESSMENT REPORT

Names	Consultation Method	Date Comments received	Issues and/or comments raised	EAP Responses
Consultation with organ of state	Email	06-Sep-24	No Response to email	EAP sent an email to consult the DFFE mrabothata@dffe.gov.za, lvdlamini@dffe.gov.com , on the Draft Basic Assessment Report.
Consultation with organ of state	Email	06-Sep-24	No Response to email	EAP sent an email to consult uThukela District Municipality gmazibuko2@uthukela.gov.za on the draft Basic Assessment Report
Consultation with organ of state	Email	16-Sep-24	No Response to email	EAP sent an email to consult the DWS reddyj@dws.gov.za on the draft Basic Assessment Report
Consultation with organ of state	Email	28-Nov-24	No Response to email	EAP sent an email to AMAFA bernadettep@amafapmb.co.za , phoaercheology@amafapmb.co.za on the draft Basic Assessment Report

Consultation with organ of state	Email	28-Nov-24	No Response to email	EAP sent an email to kzn wildlife dominic.wieners@kznwildlife.com on the draft Basic Assessment Report
Cllr Zungu		04-Sep-24	Who is the applicant and where are they from?	**Sunday Mabaso** Niel van Zyl is the applicant, he is based in Bronkhorstspruit, we will come with him when we come for public participation, but if cannot make it, the company will send a representative.
			I see the red boundary to understand who the adjacent communities are?	**Cecil Dau** The communities on the boundary are Kokwane, Maweni and Tugela Estates.
			I've already provided contact details for the chieftaincy (Mthembu), as you'll need their blessings to progress so that the councillor can mobilise and arrange the meeting.	**Sunday Mabaso** The applicant has already spoken with the king, who has indicated that we can meet with the ward councillor, but if we need him to interfere, we will contact him so that we do not mix up protocols, but I'm relieved now that we know the protocol. We will notify the client that you advised that we should communicate with the chief.
Mabuyi Mkhize		19-Sep-24	Wont the potential coal mine damage our water and disturb our farming?	**Sunday Mabaso** The specialist studies conducted include mitigation measures to prevent contamination or disturbance of the water flow.

Mlungisi Mvelase		19-Sep-24	How will the client make sure that after making money, the area will not look like those mines in Joburg, which are not rehabilitated which might attract zama-zamas	**Sunday Mabaso** According to the law, the mines must draft a closure plan and state how they are going to rehabilitate post mining.
Sithongwa Miya		19-Sep-24	Did the chief give up the land?	**Sunday Mabaso** The chief did not give up any land nor consent but supports the development if we comply with the regulations and the requirements stated by the DMRE, hence we came to see you today.

Appendix 3:

Appendix 3G: Proof of Consultation with State Departments

info

From: Mulalo Mafunisa
Sent: Friday, 07 February 2025 10:14
To:
Cc: Sunday Mabaso; khanyile mgiba; info
Subject: Re: CONSULTATION OF THE BASIC ASSESSMENT REPORT FOR COMMENTS

Good day,

I'm writing to follow up on the invitation to comment and review the Basic Assessment Report for the application of Environmental Authorisation for a prospecting right dated September 06, 2024 for Saqondisana Investment (Pty) Ltd, DMRE ref no, KZN 30/5/1/1/2/ 11694 PR for coal in respect of farms Emaweni 18034 GT, Osaka 12977 GT, Kaisha 14719 GT, Lot Mga 8761 GT, Krom Poort 2155 GT and Ravine 9201 GT, in the Magisterial District of Estcourt/ uThukela, Kwazulu-Natal Province.

Looking forward to your comments.

Kind regards,

Email Disclaimer:
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From: info <info@vahlengweadvisory.co.za>
Sent: Tuesday, 17 September 2024 15:32
To:
Cc: Cecil Dau <cecil@vahlengweadvisory.co.za>; Sunday Mabaso <sunday@vahlengweadvisory.co.za>; Mulalo Mafunisa <Mulalo@vahlengweadvisory.co.za>
Subject: Re: CONSULTATION OF THE BASIC ASSESSMENT REPORT FOR COMMENTS

Good day,

I hope this email finds you well.

Please see attached Kml for an application for Environmental Authorisation for prospecting right activites for Saqondisana Investment (Pty) Ltd, KZN 11694 PR for your comments.

Looking forward to your comments.

kind regards,

From:
Sent: Tuesday, 17 September 2024 15:01
To: Mulalo Mafunisa <Mulalo@vahlengweadvisory.co.za>; Sunday Mabaso <sunday@vahlengweadvisory.co.za>; info <info@vahlengweadvisory.co.za>; Cecil Dau <cecil@vahlengweadvisory.co.za>

Subject: RE: CONSULTATION OF THE BASIC ASSESSMENT REPORT FOR COMMENTS

Dear Sir/Madam

DFFE Directorate: Biodiversity Conservation hereby acknowledge receipt of the invitation to review and comment on the project mentioned on the subject line. Kindly note that the project has been allocated to Mrs M Rabothata and Ms Lindiwe Dlamini (Copied on this email). In addition, kindly share the shapefiles of the development footprints/application site with the Case Officers.

Please note: All Public Participation Process documents related to Biodiversity EIA review and any other Biodiversity EIA queries must be submitted to the Directorate: Biodiversity Conservation at Email: for attention of Mr Seoka Lekota.

Kind regards,

From: Mulalo Mafunisa <Mulalo@vahlengweadvisory.co.za>
Sent: Friday, 06 September 2024 15:52
To:
Cc: >; Sunday Mabaso <sunday@vahlengweadvisory.co.za>; info <info@vahlengweadvisory.co.za>; Cecil Dau <cecil@vahlengweadvisory.co.za>
Subject: CONSULTATION OF THE BASIC ASSESSMENT REPORT FOR COMMENTS

Good day,

CONSULTATION OF DRAFT BASIC ASSESSMENT REPORT OF AN APPLICATION FOR AN ENVIRONMENTAL AUTHORISATION IN TERMS OF SECTION 24 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) READ WITH REGULATION 19 OF THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 (AS AMENDED) FOR A PROSPECTING RIGHT FOR COAL IN RESPECT OF FARMS EMAWENI 18034 GT, OSAKA 12977 GT, KAISHA 14719 GT, LOT MGA 8761 GT, KROM POORT 2155 GT AND RAVINE 9201 GT, WITHIN THE MAGISTERIAL DISTRICT OF UTHUKELA, KWAZULU-NATAL PROVINCE. NZ 30/5/1/1/2/ 11694 PR

I hope this email finds you well.

My name is Mulalo Mafunisa, I am a stakeholder engagement consultant at Vahlengwe Mining Advisory and Consulting.

Saqondisana Investment (Pty) Ltd "the applicant" applied for an Environmental Authorisation in terms of section 24 of the National Environmental Management Act,1998 (Act 107 of 1998) read with regulation 19 of the Environmental Impact Assessment (EIA) regulations, 2014 (as amended) and appointed Vahlengwe Mining Advisory (EAP) to facilitate the proposed prospecting right application for coal in respect of farms Emaweni 17538 GT, Osaka 12977 GT, Kaisha 14719 GT, Lot Mga 8761 GT, Krom Poort 2155 GT and Ravine 9201 GT, within the magisterial district of Uthukela, Kwazulu-Natal province.

In accordance with section 24k of the National Environmental Management Act (Act 107 of 1998)(as amended), We would like to consult draft Basic Assessment Report (BAR) for your comments.

Should you require any further information, please do not hesitate to contact me. looking forward to your comments.

Kind regards,

info

From:	Mulalo Mafunisa
Sent:	Friday, 06 September 2024 15:52
To:	
Cc:	ı; Sunday Mabaso; info; Cecil Dau
Subject:	CONSULTATION OF THE BASIC ASSESSMENT REPORT FOR COMMENTS
Attachments:	Saqondisana-11694 PR_Draft BAR.pdf

Good day,

CONSULTATION OF DRAFT BASIC ASSESSMENT REPORT OF AN APPLICATION FOR AN ENVIRONMENTAL AUTHORISATION IN TERMS OF SECTION 24 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) READ WITH REGULATION 19 OF THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 (AS AMENDED) FOR A PROSPECTING RIGHT FOR COAL IN RESPECT OF FARMS EMAWENI 18034 GT, OSAKA 12977 GT, KAISHA 14719 GT, LOT MGA 8761 GT, KROM POORT 2155 GT AND RAVINE 9201 GT, WITHIN THE MAGISTERIAL DISTRICT OF UTHUKELA, KWAZULU-NATAL PROVINCE. NZ 30/5/1/1/2/ 11694 PR

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In accordance with section 24k of the National Environmental Management Act (Act 107 of 1998)(as amended), We would like to consult draft Basic Assessment Report (BAR) for your comments.

Should you require any further information, please do not hesitate to contact me. looking forward to your comments.

Kind regards,

khanyile mgiba

From: Mulalo Mafunisa
Sent: Friday, 06 September 2024 15:33
To:
Cc: info; Sunday Mabaso; Cecil Dau; khanyile mgiba
Subject: CONCULTATION OF THE BASIC ASSESSMENT REPORT FOR COMMENTS
Attachments: Saqondisana-11694 PR_Draft BAR.pdf

Good day,

CONSULTATION OF DRAFT BASIC ASSESSMENT REPORT OF AN APPLICATION FOR AN ENVIRONMENTAL AUTHORISATION IN TERMS OF SECTION 24 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) READ WITH REGULATION 19 OF THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 (AS AMENDED) FOR A PROSPECTING RIGHT FOR COAL IN RESPECT OF FARMS EMAWENI 18034 GT, OSAKA 12977 GT, KAISHA 14719 GT, LOT MGA 8761 GT, KROM POORT 2155 GT AND RAVINE 9201 GT, WITHIN THE MAGISTERIAL DISTRICT OF UTHUKELA, KWAZULU-NATAL PROVINCE. NZ 30/5/1/1/2/ 11694 PR

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In accordance with section 24k of the National Environmental Management Act (Act 107 of 1998)(as amended), We would like to consult the draft Basic Assessment Report (BAR) for your comments.

Should you require any further information, please do not hesitate to contact me. looking forward to your comments.

Kind regards,

info

From: Mulalo Mafunisa
Sent: Friday, 07 February 2025 10:17
To:
Cc: khanyile mgiba; info; Sunday Mabaso
Subject: Re: CONSULTATION OF THE DRAFT BASIC ASSESSMENT REPORT FOR COMMENTS

Good day,

I'm writing to follow up on the invitation to comment and review the Basic Assessment Report for the application of Environmental Authorisation for a prospecting right dated September 16, 2024 for Saqondisana Investment (Pty) Ltd, DMRE ref no, KZN 30/5/1/1/2/ 11694 PR for coal in respect of farms Emaweni 18034 GT, Osaka 12977 GT, Kaisha 14719 GT, Lot Mga 8761 GT, Krom Poort 2155 GT and Ravine 9201 GT, in the Magisterial District of Estcourt/ uThukela, Kwazulu-Natal Province.

Looking forward to your comments.

Kind regards,

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From: Mulalo Mafunisa <Mulalo@vahlengweadvisory.co.za>
Sent: Monday, 16 September 2024 09:27
To:
Cc: Cecil Dau <cecil@vahlengweadvisory.co.za>; khanyile mgiba <Khanyile@vahlengweadvisory.co.za>; info <info@vahlengweadvisory.co.za>
Subject: CONSULTATION OF THE DRAFT BASIC ASSESSMENT REPORT FOR COMMENTS

Good day,

CONSULTATION OF THE DRAFT BASIC ASSESSMENT REPORT OF AN APPLICATION FOR AN ENVIRONMENTAL AUTHORISATION IN TERMS OF SECTION 24 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) READ WITH REGULATION 19 OF THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 (AS AMENDED) FOR A PROSPECTING RIGHT FOR COAL IN RESPECT OF FARMS EMAWENI 18034 GT, OSAKA 12977 GT, KAISHA 14719 GT, LOT MGA 8761 GT, KROM POORT 2155 GT AND RAVINE 9201 GT, WITHIN THE MAGISTERIAL DISTRICT OF UTHUKELA, KWAZULU-NATAL PROVINCE. NZ 30/5/1/1/2/ 11694 PR

I hope this email finds you well.

My name is Mulalo Mafunisa, I am a stakeholder engagement consultant at Vahlengwe Mining Advisory and Consulting.

Saqondisana Investment (Pty) Ltd the "applicant" applied for an Environmental Authorisation in terms of section 24 of the National Environmental Management Act,1998 (Act 107 of 1998) read with regulation 19 of the Environmental Impact Assessment (EIA) regulations, 2014 (as amended) and appointed Vahlengwe Mining Advisory (EAP) to facilitate the proposed prospecting right application for coal in respect of farms Emaweni 17538 GT, Osaka 12977 GT, Kaisha 14719 GT, Lot Mga 8761 GT, Krom Poort 2155 GT and Ravine 9201 GT, within the magisterial district of Uthukela, Kwazulu-Natal province.

In accordance with section 24k of the National Environmental Management Act (Act 107 of 1998)(as amended), We would like to consult the draft Basic Assessment Report (BAR) for your comments.

Should you require any further information, please do not hesitate to contact me. looking forward to your comments.

Kind regards,

khanyile mgiba

From: Mulalo Mafunisa
Sent: Thursday, 28 November 2024 14:52
To:
Cc: Sunday Mabaso; khanyile mgiba; lcy.nvz@gmail.com
Subject: AMAFA: CONSULTATION OF THE ENVIRONMENTAL IMPACT ASSESSMENT FOR COMMENTS

Importance: High

Good day,

CONSULTATION OF DRAFT BASIC ASSESSMENT REPORT OF AN APPLICATION FOR AN ENVIRONMENTAL AUTHORISATION IN TERMS OF SECTION 24 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) READ WITH REGULATION 19 OF THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 (AS AMENDED) FOR A PROSPECTING RIGHT FOR COAL IN RESPECT OF FARMS EMAWENI 18034 GT, OSAKA 12977 GT, KAISHA 14719 GT, LOT MGA 8761 GT, KROM POORT 2155 GT AND RAVINE 9201 GT, WITHIN THE MAGISTERIAL DISTRICT OF UTHUKELA, KWAZULU-NATAL PROVINCE. NZ 30/5/1/1/2/ 11694 PR

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In accordance with section 24k of the National Environmental Management Act (Act 107 of 1998)(as amended), We would like to consult the draft Basic Assessment Report (BAR) for your comments.

Should you require any further information, please do not hesitate to contact me. looking forward to your comments.

Kind regards,

Email Disclaimer:

khanyile mgiba

From: Mulalo Mafunisa
Sent: Friday, 07 February 2025 10:24
To:
Cc: Icy.nvz@gmail.com; Sunday Mabaso; khanyile mgiba
Subject: Re: KZN WILDLIFE: CONSULTATION OF THE ENVIRONMENTAL AUTHORISATION FOR COMMENTS

Good day,

I'm writing to follow up on the invitation to comment and review the Basic Assessment Report for the application of Environmental Authorisation for a prospecting right dated November 28, 2024 for Saqondisana Investment (Pty) Ltd, DMRE ref no, KZN 30/5/1/1/2/ 11694 PR for coal in respect of farms Emaweni 18034 GT, Osaka 12977 GT, Kaisha 14719 GT, Lot Mga 8761 GT, Krom Poort 2155 GT and Ravine 9201 GT, in the Magisterial District of Estcourt/ uThukela, Kwazulu-Natal Province.

Looking forward to your comments.

Kind regards,

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From: Mulalo Mafunisa <Mulalo@vahlengweadvisory.co.za>
Sent: Thursday, 28 November 2024 14:49
Cc: Icy.nvz@gmail.com <Icy.nvz@gmail.com>; Sunday Mabaso <sunday@vahlengweadvisory.co.za>; khanyile mgiba <Khanyile@vahlengweadvisory.co.za>
Subject: KZN WILDLIFE: CONSULTATION OF THE ENVIRONMENTAL AUTHORISATION FOR COMMENTS

Good day,

CONSULTATION OF DRAFT BASIC ASSESSMENT REPORT OF AN APPLICATION FOR AN ENVIRONMENTAL AUTHORISATION IN TERMS OF SECTION 24 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 OF 1998) READ WITH REGULATION 19 OF THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 (AS AMENDED) FOR A PROSPECTING RIGHT FOR COAL IN RESPECT OF FARMS EMAWENI 18034 GT, OSAKA 12977 GT, KAISHA 14719 GT, LOT MGA 8761 GT, KROM POORT 2155 GT AND RAVINE 9201 GT, WITHIN THE MAGISTERIAL DISTRICT OF UTHUKELA, KWAZULU-NATAL PROVINCE. NZ 30/5/1/1/2/ 11694 PR

I hope this email finds you well.

My name is Mulalo Mafunisa, I am a stakeholder engagement consultant at Vahlengwe Mining Advisory and Consulting.

Saqondisana Investment (Pty) Ltd "the applicant" applied for an Environmental Authorisation in terms of section 24 of the National Environmental Management Act,1998 (Act 107 of 1998) read with regulation 19 of the Environmental Impact Assessment (EIA) regulations, 2014 (as amended) and appointed Vahlengwe Mining Advisory (EAP) to facilitate the proposed prospecting right application for coal in respect of farms Emaweni 17538 GT, Osaka 12977 GT, Kaisha 14719 GT, Lot Mga 8761 GT, Krom Poort 2155 GT and Ravine 9201 GT, within the magisterial district of Uthukela, Kwazulu-Natal province.

In accordance with section 24k of the National Environmental Management Act (Act 107 of 1998)(as amended), We would like to consult the draft Basic Assessment Report (BAR) for your comments.

Should you require any further information, please do not hesitate to contact me. looking forward to your comments.

Kind regards,

Appendix 4:

Appendix 4: Environmental Screening Report

SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE ENVIRONMENTAL SENSITIVITY

EIA Reference number: KZN 30/5/1/1/2/11694 PR

Project name: Prospecting Right Application

Project title: Saqondisana Investment Prospecting Right Application

Date screening report generated: 02/09/2024 10:18:30

Applicant: Saqondisana Investment (Pty) Ltd

Compiler: Vahlengwe Mining Advisory and Consulting

Compiler signature: k mgiba-mutero .....

Application Category: Mining|Prospecting rights

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Table of Contents

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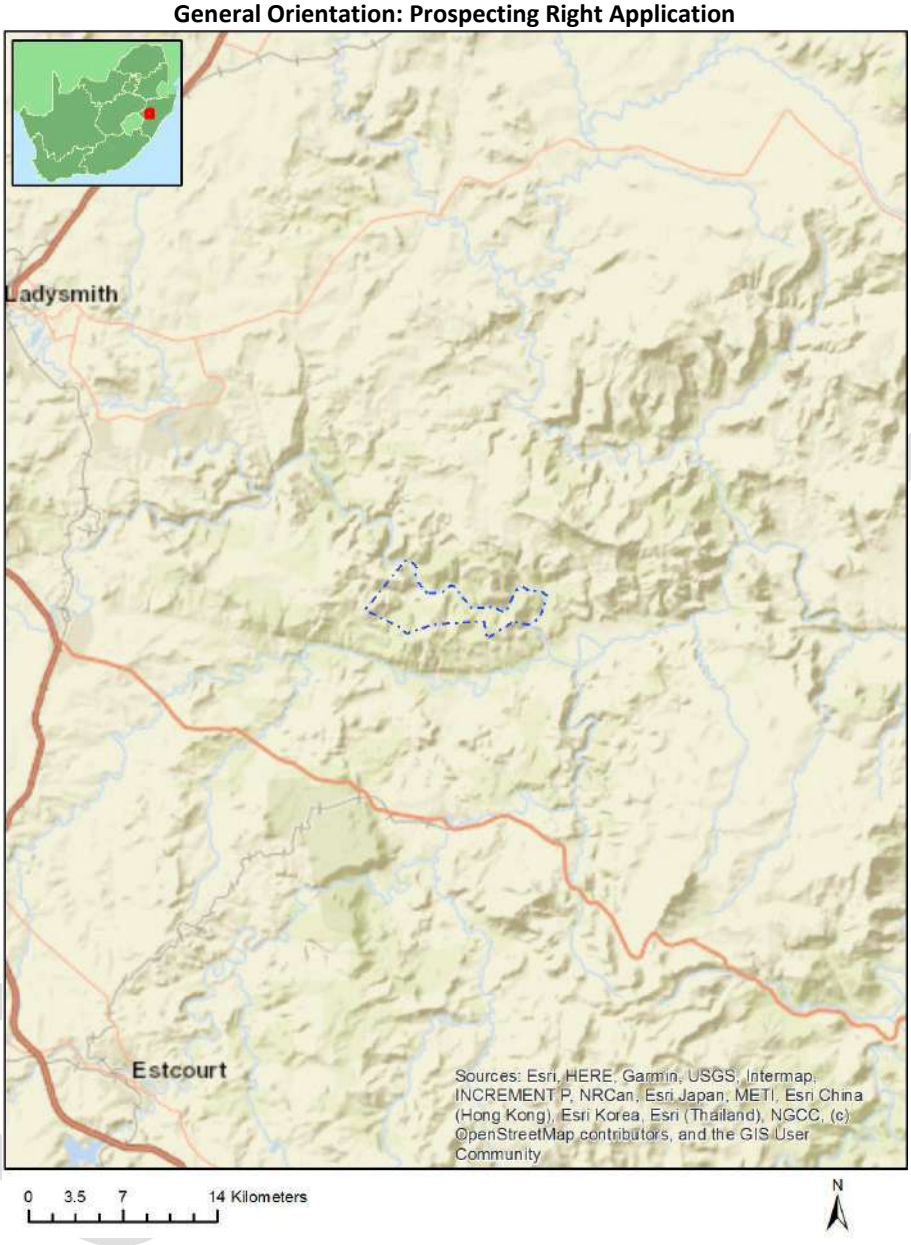
Proposed Project Location

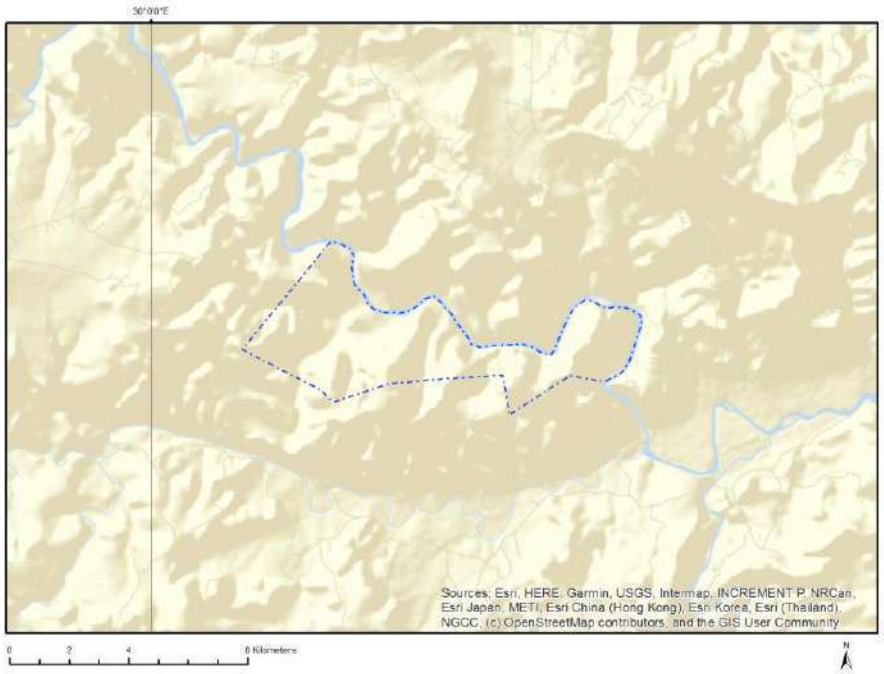
Orientation map 1: General location

General Orientation: Prospecting Right Application



Disclaimer applies

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	KROM POORT	2155	0	28°43'27.05S	30°3'16.36E	Farm
2	LOT MGA	8761	0	28°43'54.03S	30°8'28.93E	Farm
3	OSAKA	12977	0	28°43'58.82S	30°5'0.44E	Farm
4	KAISHA	14719	0	28°43'58.37S	30°7'38.12E	Farm
5	MTHEMBU	17538	0	28°42'28.99S	30°7'47.39E	Farm
6	YATTON	7647	0	28°44'58.41S	30°5'8.78E	Farm
7	KAISHA	14719	0	28°43'59.22S	30°7'38.18E	Farm Portion
8	OSAKA	12977	1	28°44'5.1S	30°6'17.59E	Farm Portion
9	LOT MGA	8761	0	28°43'54.57S	30°8'28.96E	Farm Portion
10		1286	0	28°43'35.84S	30°10'57.58E	Farm Portion
11	KROM POORT	2155	0	28°43'27.61S	30°3'16.29E	Farm Portion
12	MTHEMBU	17538	0	28°42'29.71S	30°7'47.37E	Farm Portion
13	YATTON	7647	0	28°45'3.04S	30°5'8.97E	Farm Portion
14		1297	0	28°42'12.56S	30°7'39.37E	Farm Portion
15	MTHEMBU	17538	0	28°42'29.38S	30°7'47.35E	Farm Portion
16	OSAKA	12977	0	28°44'0.99S	30°4'52.36E	Farm Portion
17		1297	0	28°42'35.15S	30°7'24.23E	Farm Portion

Development footprint[1] vertices:
No development footprint(s) specified.

[1] "development footprint", means the area within the site on which the development will take place and incudes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

Disclaimer applies

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 site as well as the most environmental sensitive features on the site based on the site 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 site are indicated below.

No intersection with any development zones found.

Proposed Development Area Environmental Sensitivity

The following summary of the development site 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
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 known impacts associated with the proposed development, 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 site 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
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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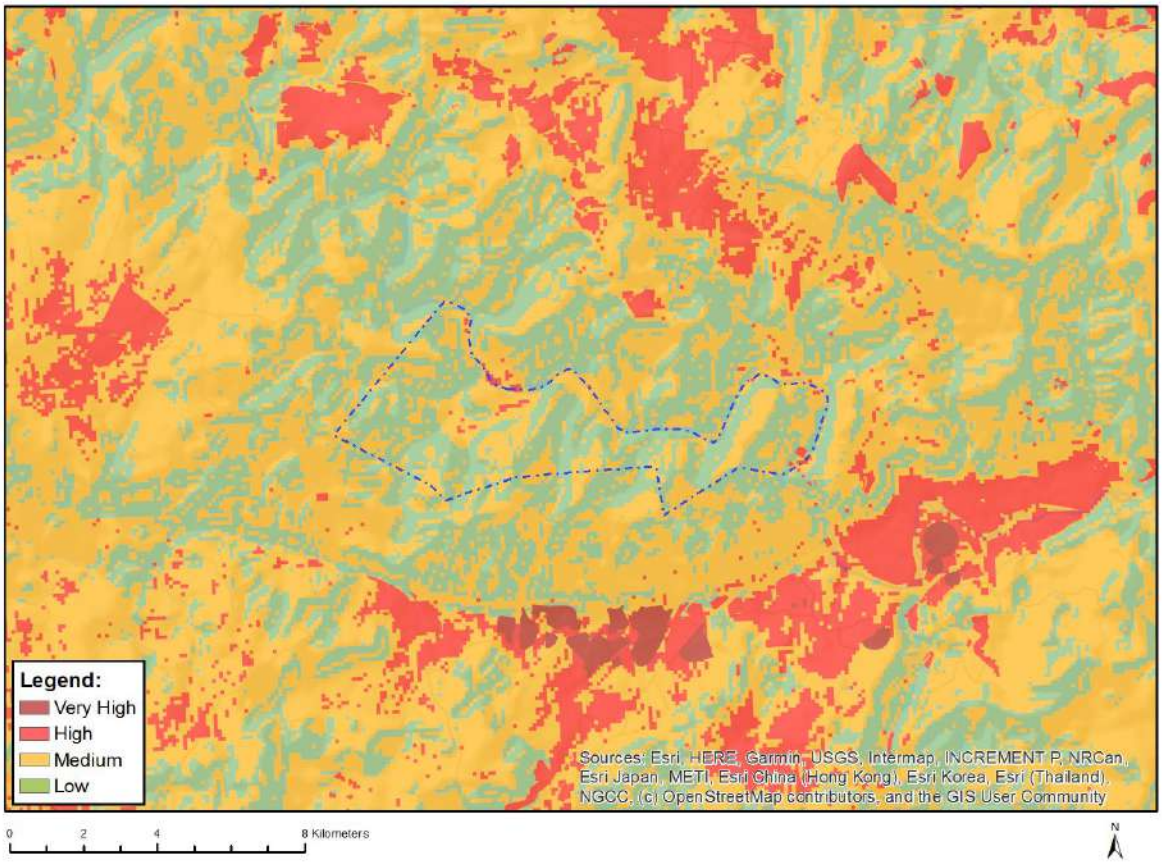
Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site 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

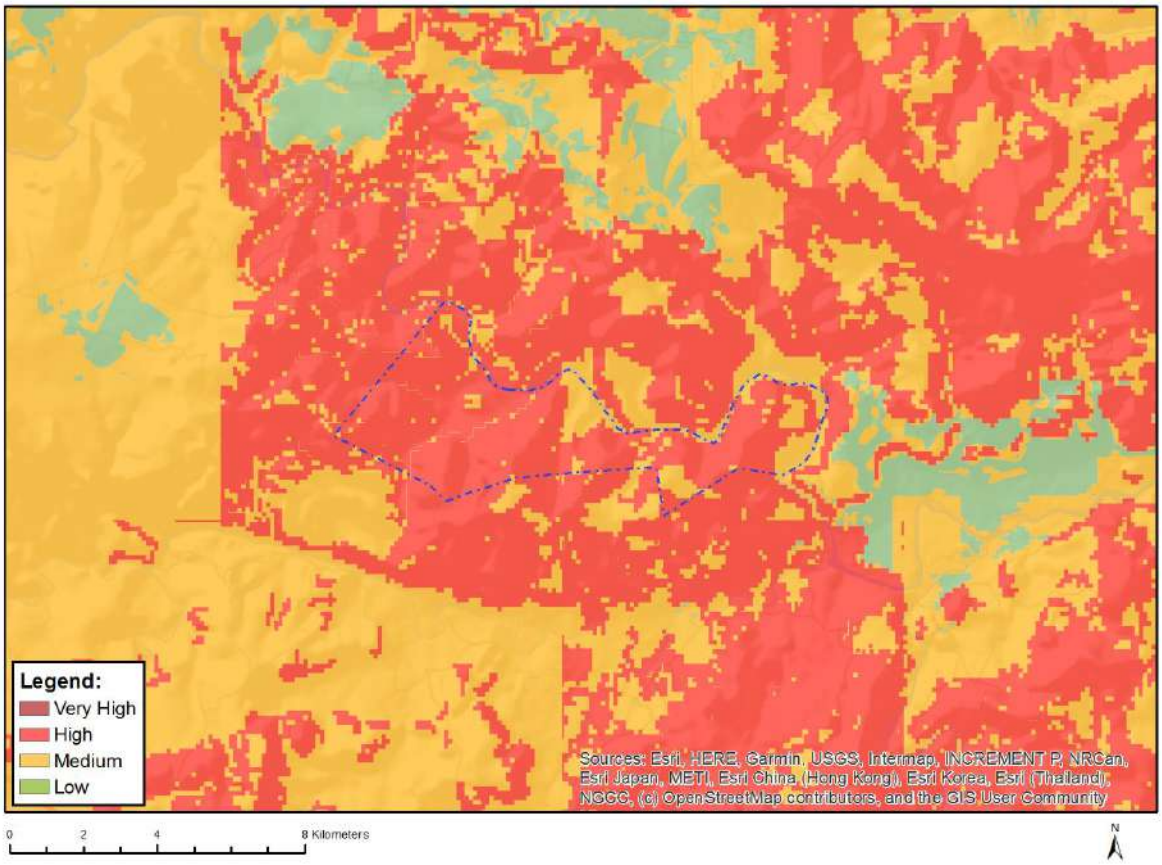


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

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
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

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

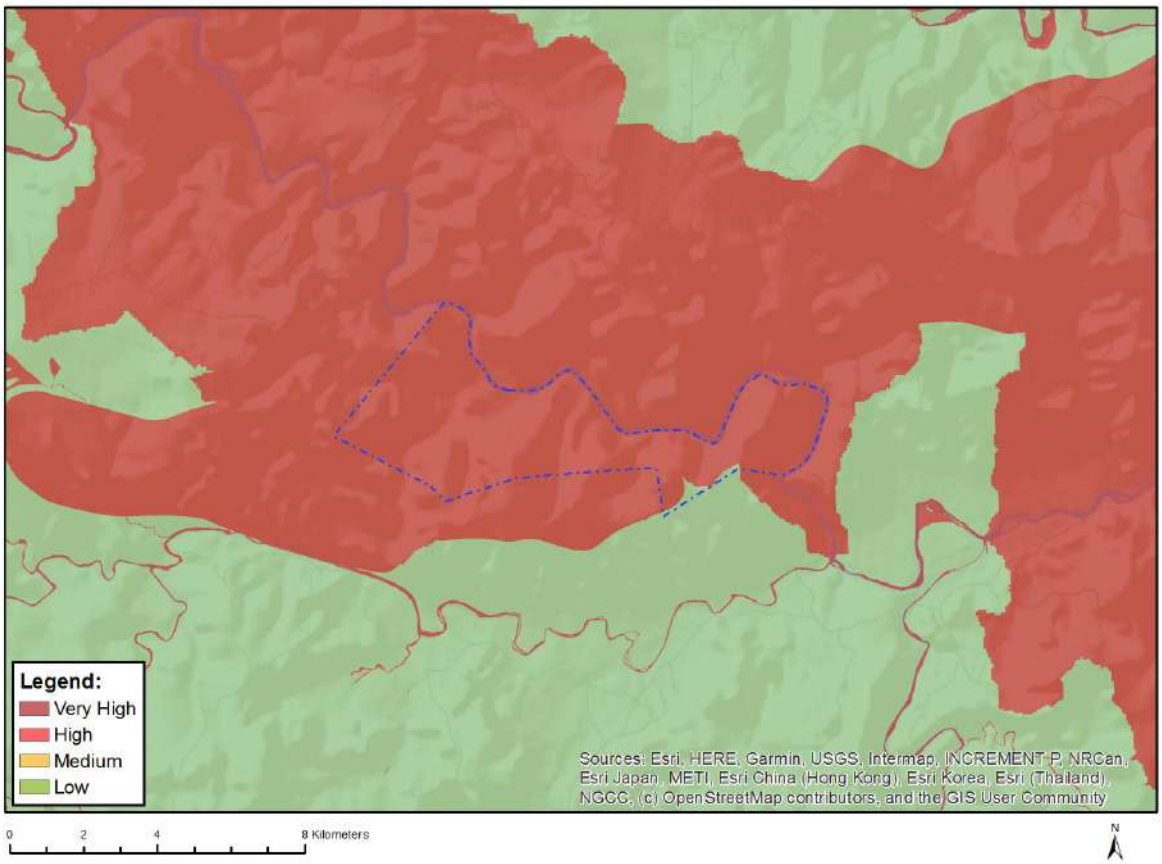
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Geronticus calvus
High	Aves-Aquila rapax
Medium	Aves-Sagittarius serpentarius
Medium	Aves-Podica senegalensis
Medium	Aves-Stephanoaetus coronatus
Medium	Aves-Hydroprogne caspia
Medium	Aves-Aquila rapax
Medium	Aves-Eupodotis senegalensis
Medium	Sensitive species 5
Medium	Mammalia-Lycaon pictus
Medium	Mammalia-Ourebia ourebi ourebi
Medium	Sensitive species 8
Medium	Reptilia-Kinixys natalensis

Disclaimer applies

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



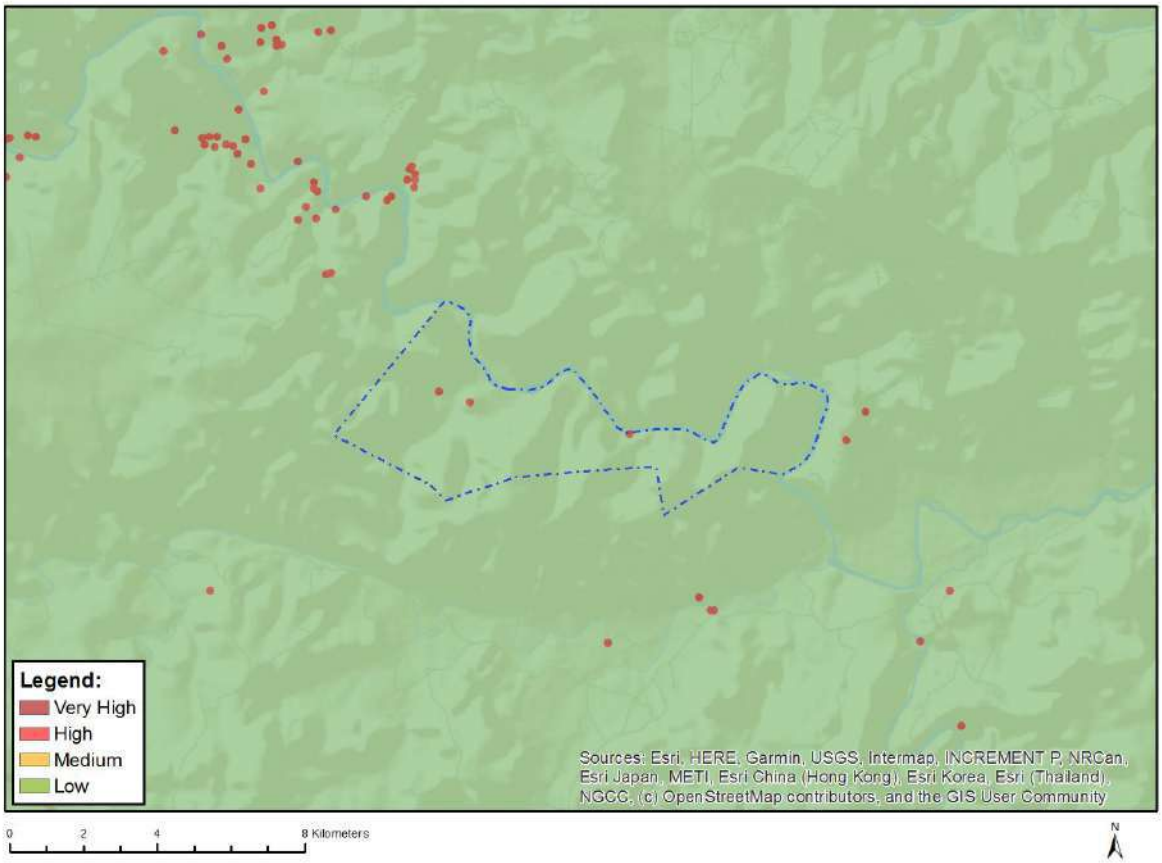
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Very High	FEPA Subcatchment
Very High	Rivers_B
Very High	SWSA (SW) _Northern Drakensberg
Very High	Wetlands_(River)

Disclaimer applies

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY



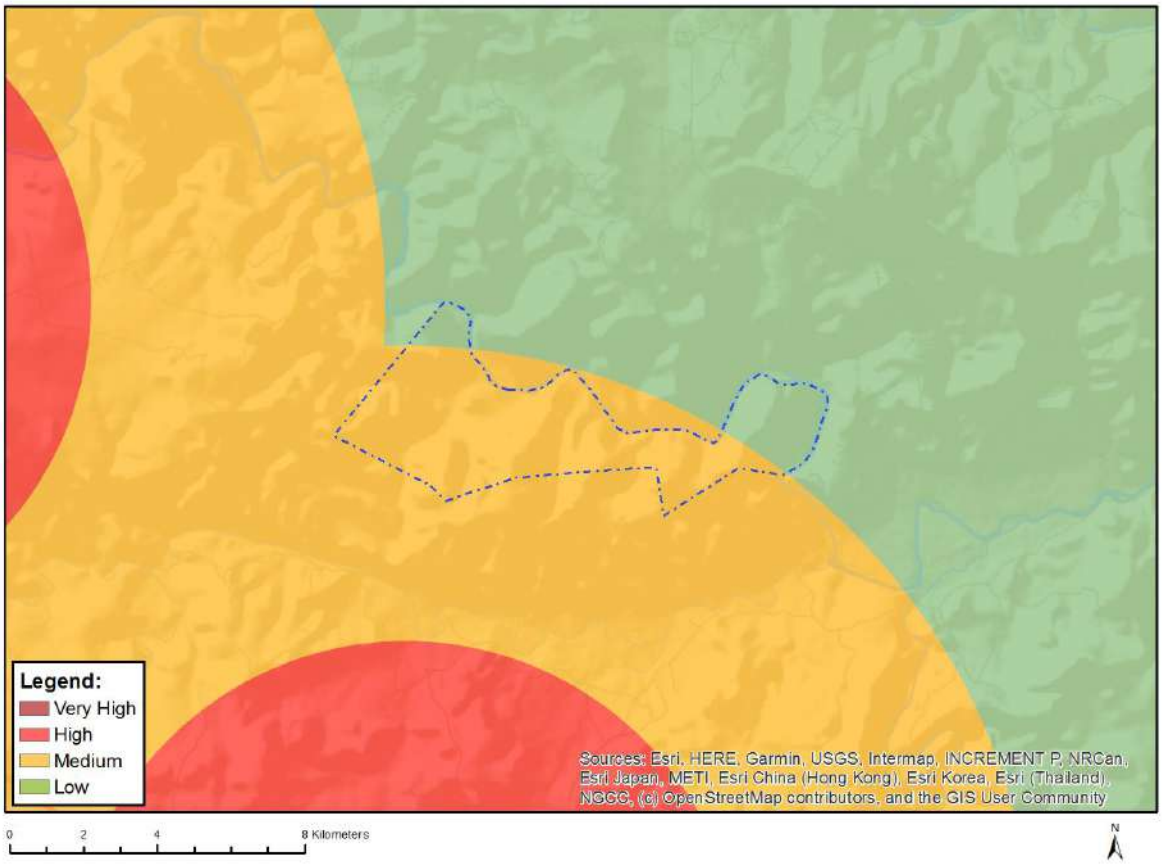
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Very High	Within 100m of an Ungraded Heritage site

Disclaimer applies
02/09/2024

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY



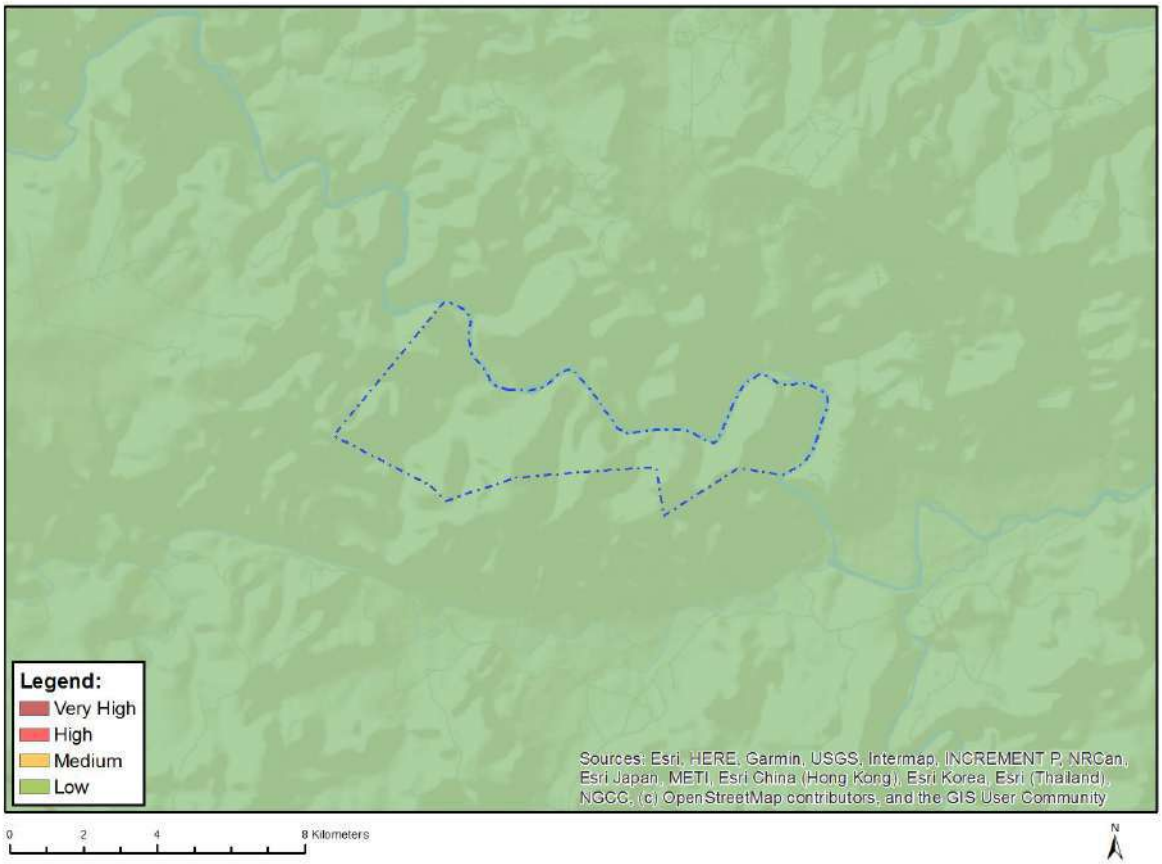
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Medium	Between 8 and 15 km of other civil aviation aerodrome

Disclaimer applies

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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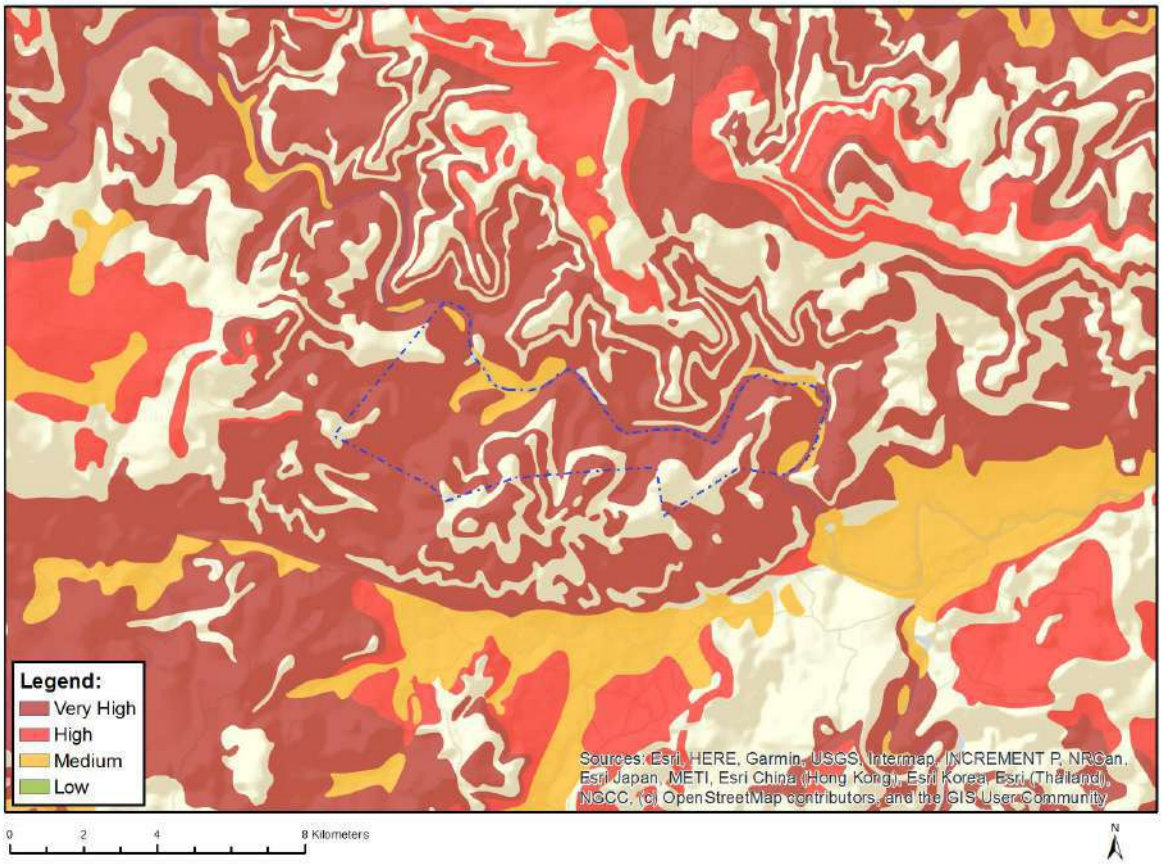
MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Medium	Features with a Medium paleontological sensitivity
Very High	Features with a Very High paleontological sensitivity

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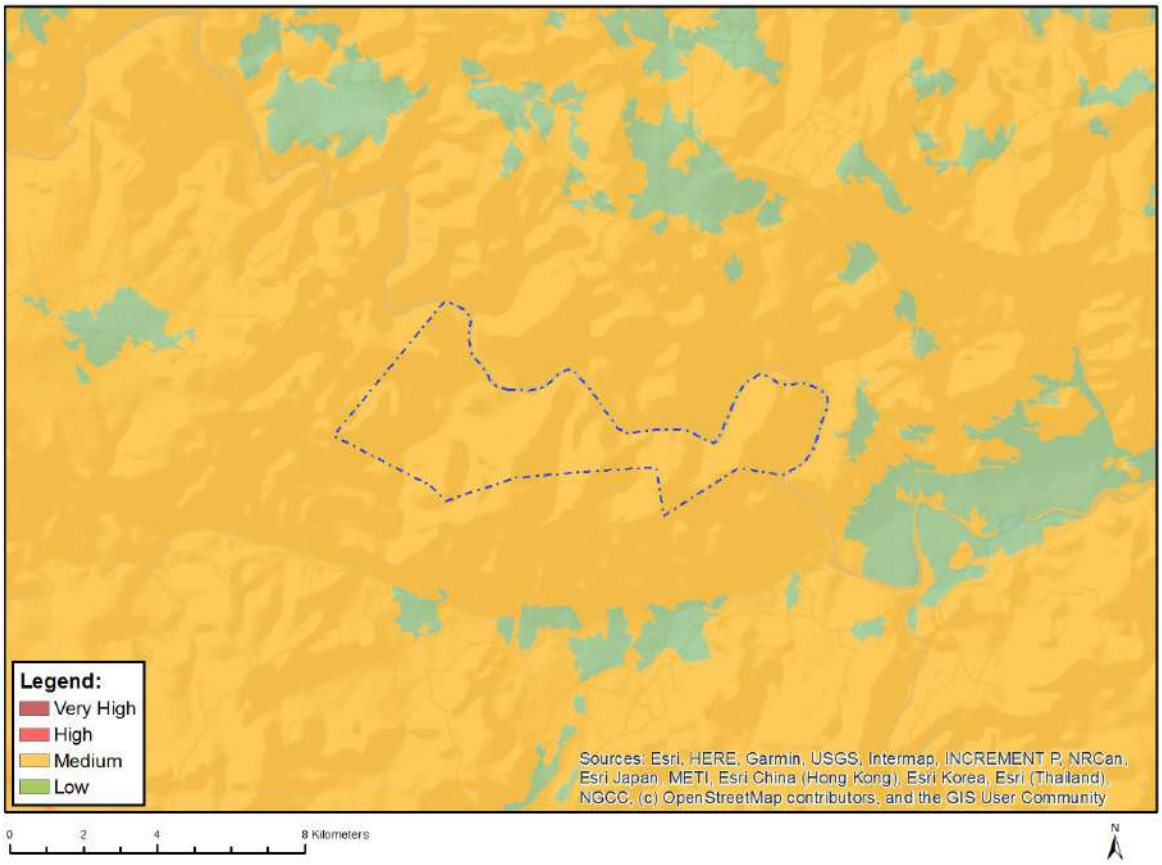
MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



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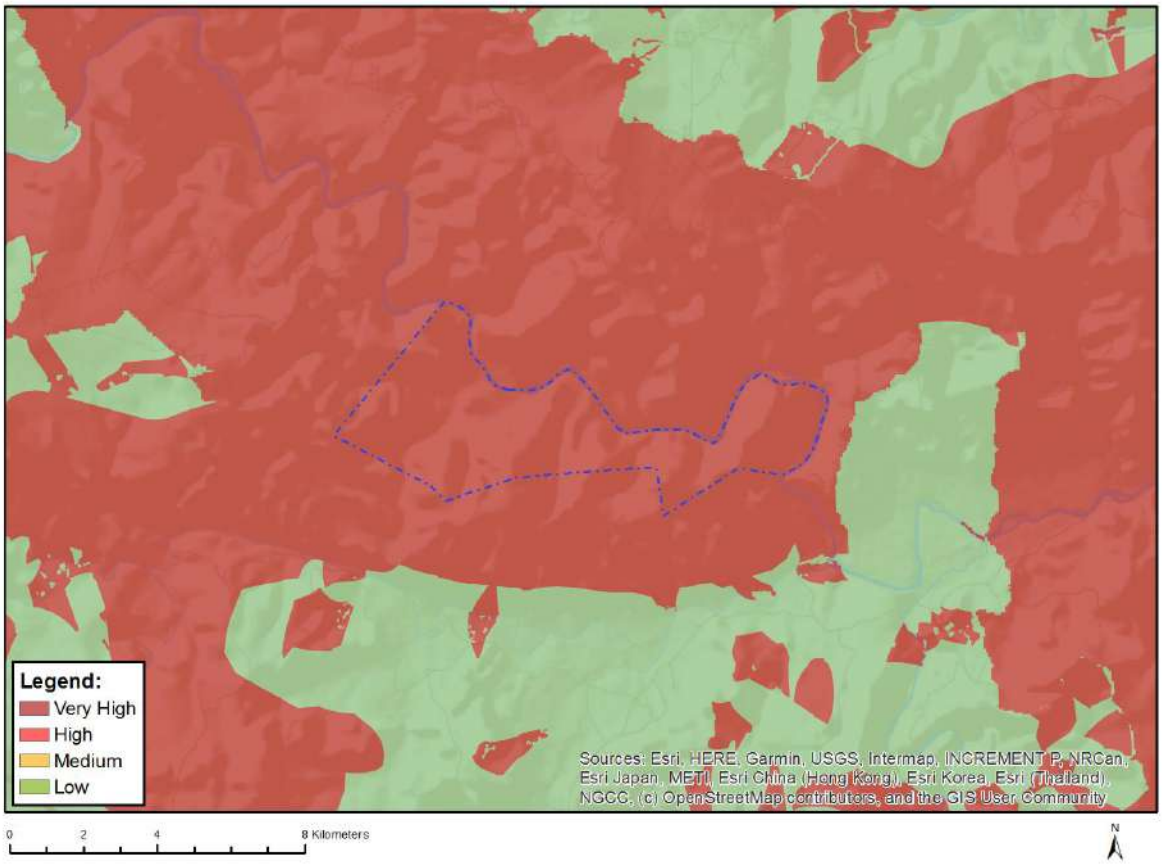
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Sensitive species 1252
Medium	Sensitive species 596
Medium	Sensitive species 1181
Medium	Vitellariopsis dispar
Medium	Thunbergia venosa

Disclaimer applies

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	ESA
Very High	CBA: Optimal
Very High	FEPA Subcatchment
Very High	SWSA (SW) _Northern Drakensberg

Disclaimer applies

SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE ENVIRONMENTAL SENSITIVITY

EIA Reference number: KZN 30/5/1/1/2/11694 PR

Project name: Prospecting Right Application

Project title: Saqondisana Investment Prospecting Right Application

Date screening report generated: 02/09/2024 10:51:33

Applicant: Saqondisana Investment (Pty) Ltd

Compiler: Vahlengwe Mining Advisory and Consulting

Compiler signature: k mgiba-mutero .....

Application Category: Mining|Prospecting rights

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Proposed Project Location

Orientation map 1: General location

General Orientation: Prospecting Right Application

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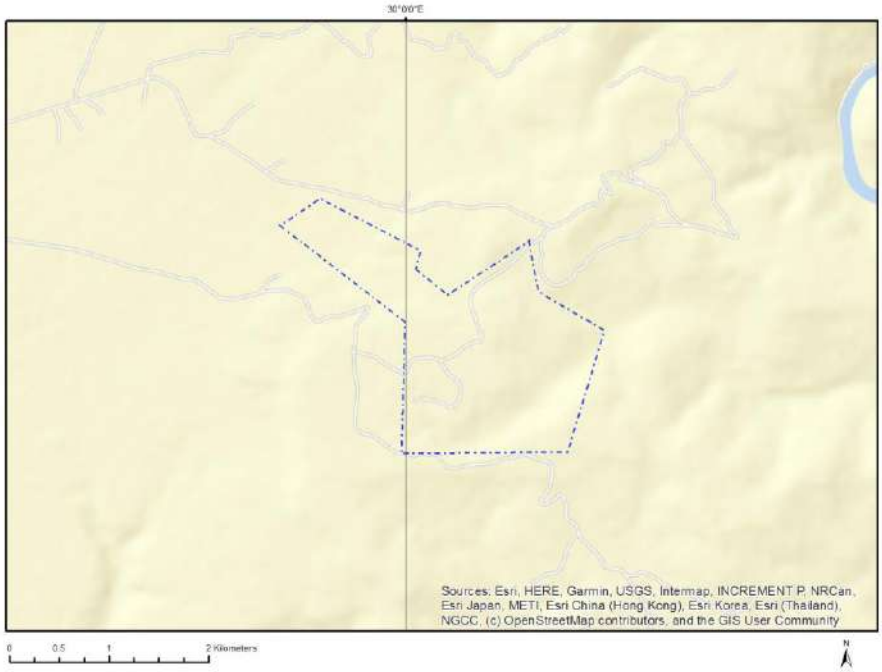
Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	EMAWENI	18034	0	28°43'3.68S	30°0'23.25E	Farm
2		2158	2	28°43'6.77S	30°0'29.09E	Farm Portion
3	EMAWENI	18034	0	28°43'4.22S	30°0'23.14E	Farm Portion
4	BRAKFONTEIN	1316	1	28°42'35.83S	29°59'46.73E	Farm Portion
5		18033	0	28°42'35.72S	29°59'46.71E	Farm Portion

Development footprint[1] vertices:
No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	12/12/20/2671	Solar PV	Approved	26.7

[1] "development footprint", means the area within the site on which the development will take place and incudes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

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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 site as well as the most environmental sensitive features on the site based on the site 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 site are indicated below.

No intersection with any development zones found.

Proposed Development Area Environmental Sensitivity

The following summary of the development site 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
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 known impacts associated with the proposed development, 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 site situation.

No	Specialist assessment	Assessment Protocol

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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
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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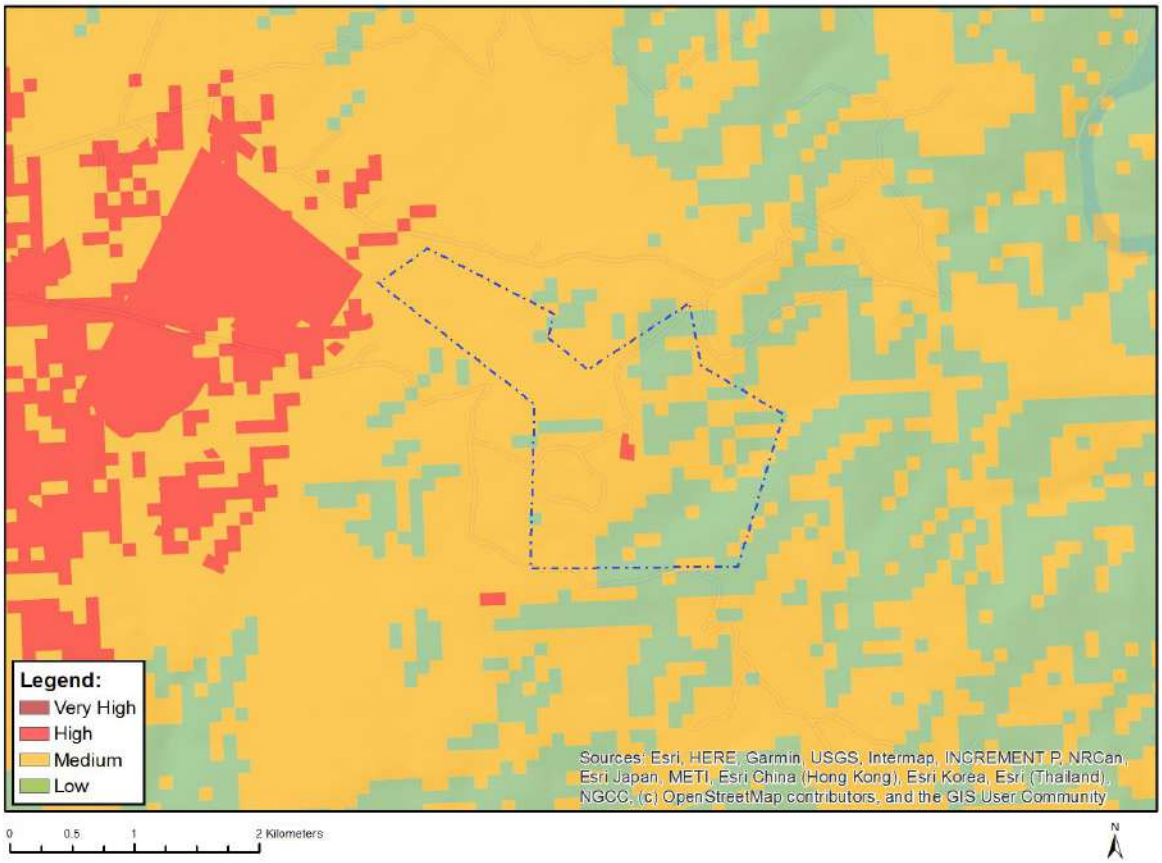
Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site 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

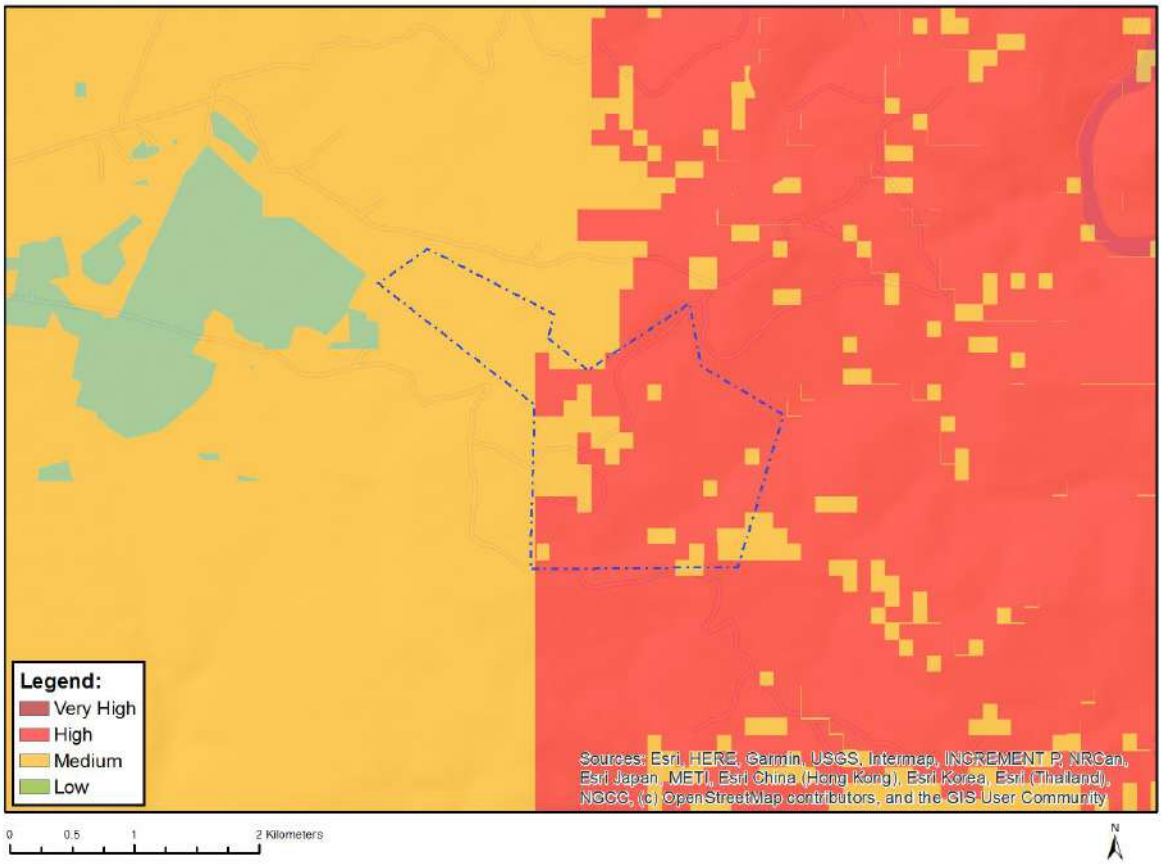


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Subsistence Farming 1;Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

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)
High	Aves-Geronticus calvus
High	Aves-Aquila rapax
Medium	Aves-Sagittarius serpentarius
Medium	Aves-Podica senegalensis
Medium	Aves-Geronticus calvus
Medium	Aves-Aquila rapax
Medium	Aves-Eupodotis senegalensis
Medium	Mammalia-Ourebia ourebi ourebi
Medium	Sensitive species 8
Medium	Reptilia-Kinixys natalensis

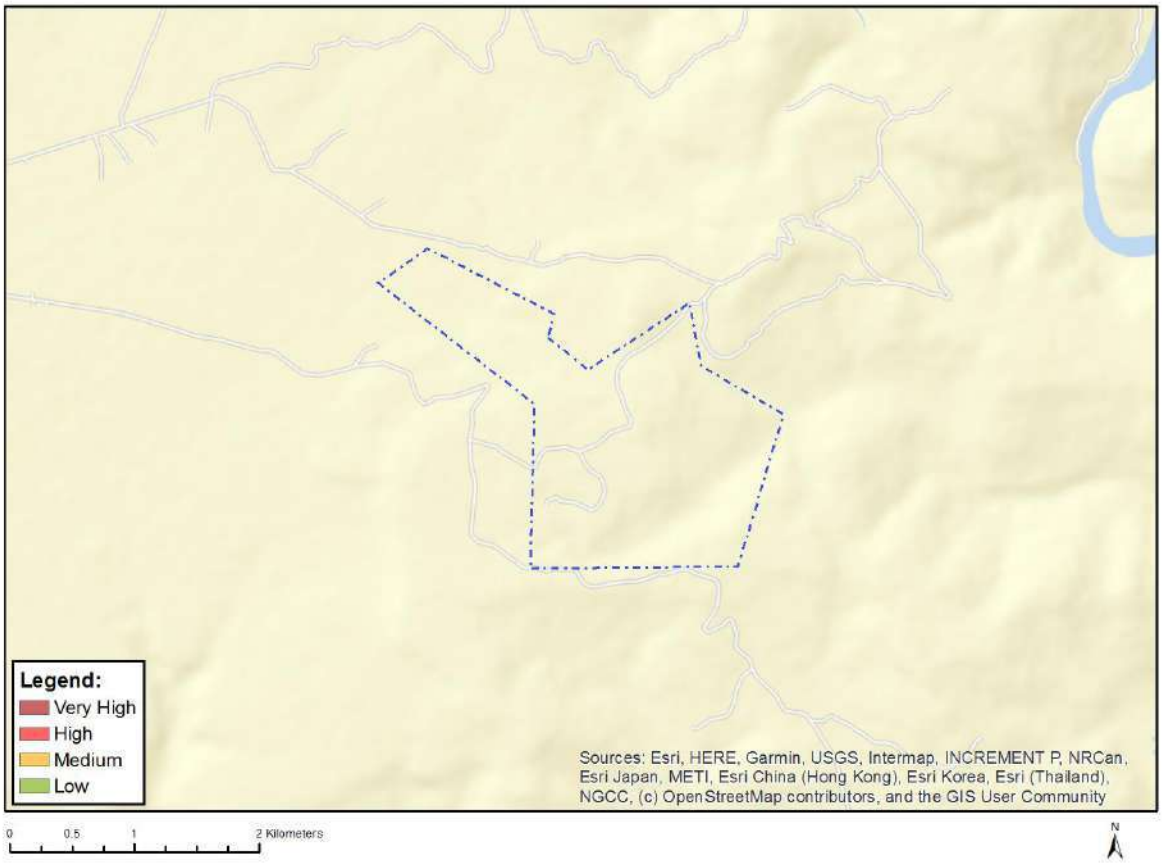
MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	FEPA Subcatchment
Very High	SWSA (SW) _Northern Drakensberg

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)
Medium	Between 8 and 15 km of other civil aviation aerodrome

Disclaimer applies
02/09/2024

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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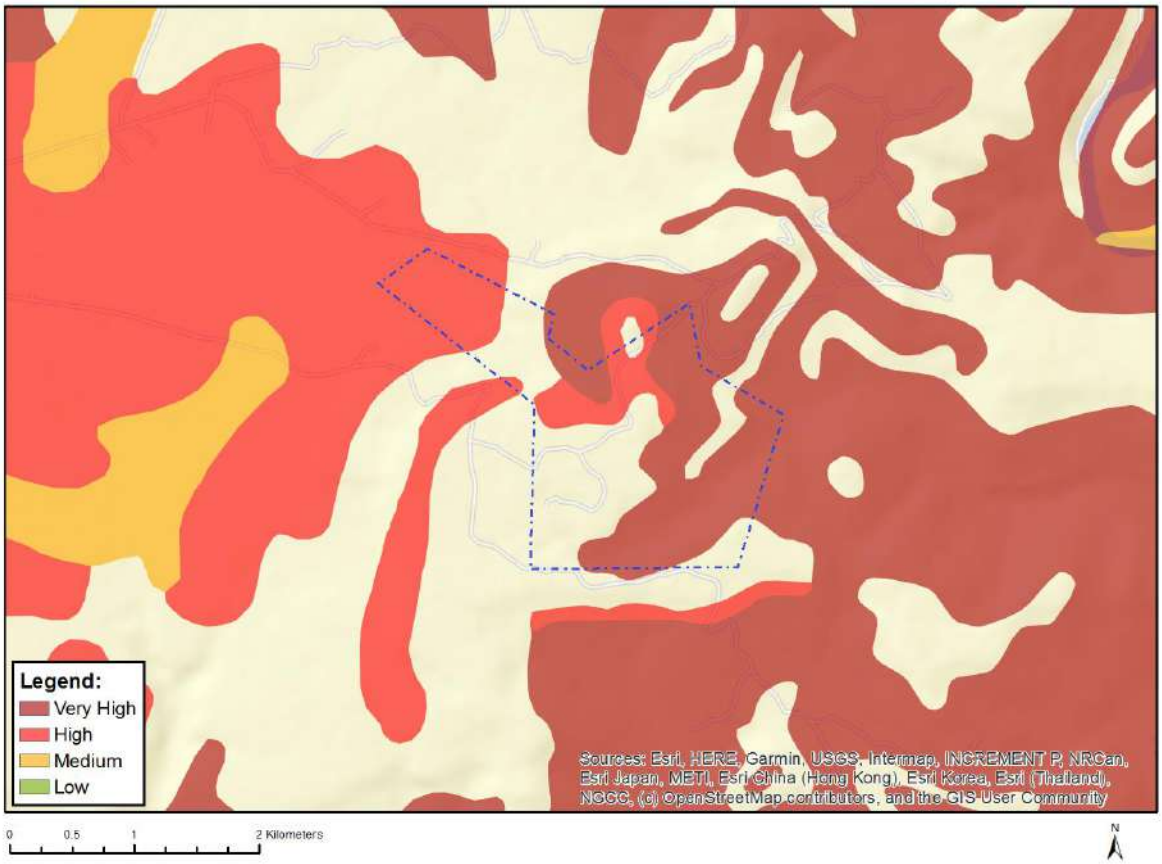
MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Features with a High paleontological sensitivity
Very High	Features with a Very High paleontological sensitivity

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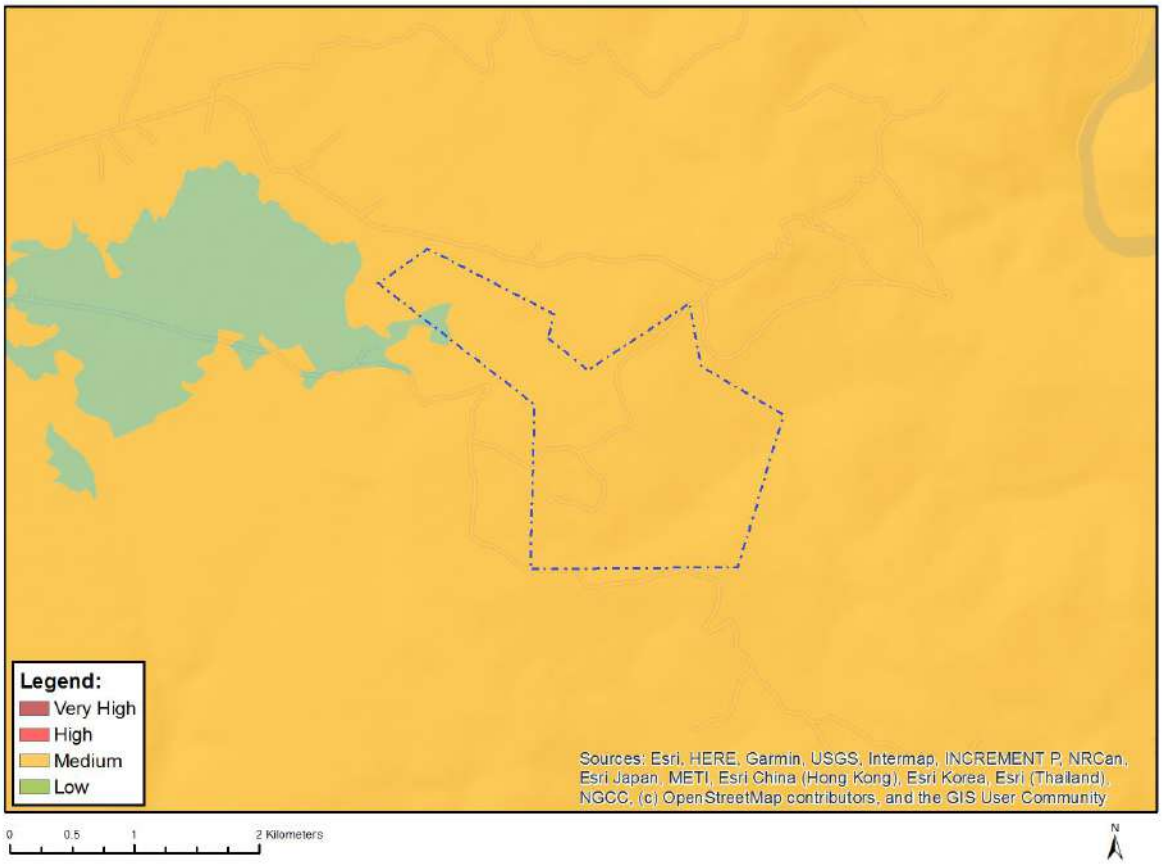
MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Sensitive species 1252
Medium	Sensitive species 596
Medium	Sensitive species 1181
Medium	Vitellariopsis dispar
Medium	Thunbergia venosa

Disclaimer applies

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	ESA
Very High	CBA: Optimal
Very High	FEPA Subcatchment
Very High	SWSA (SW) _Northern Drakensberg

Disclaimer applies

Appendix 5:

Appendix 5: Specialists Report

February 2025

NALEDZANI ENVIRONMENTAL SERVICES
Promoting sustainable use of our natural resources

ECOLOGICAL AND WETLAND IMPACT ASSESSMENT REPORT

THE PROSPECTING RIGHT FOR COAL IN RESPECT OF FARM LOTMGA 8761 GT, FARM KAISHA 14719 GT, FARM OSAKA 12977 GT, FARM KROMPOORT 2155 GT AND FARM RAVINE 9201 GT WITHIN THE INKOSI LANGALIBALELE LOCAL MUNICPLAITY OF THE UTHUKELA DISTRICT, KWAZULU-NATAL PROVINCE

PREAPRED FOR:

VAHLENGWE MINING ADVISORY AND CONSULTING (PTY) LTD

PREPARED BY:

NALEDZANI ENVIRONMENTAL SERVICES

DATE:

DECEMBER 2024

078 901 4833
076 388 7203
ramalivhanam@gmail.com
ramalivhanam@naledzanies.co.za
www.naledzanies.co.za

PROPRIETARY INFORMATION

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PROJECT DETAILS	
Project Title	Saqondisa PR Application
Client	Vahlengwe Mining Advisory and Consulting (Pty) Ltd
Description	Terrestrial ecological and wetland impact assessment for the prospecting right for coal in respect of Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT and Farm Ravine 9201 GT in the Magisterial District of Estcourt District, KwaZulu-Natal Province
Document Status	Final
Prepared by	Mpho Ramalivhana Pri Sci. Nat (Hons. Bot.; SAAB; SACNASP)
Date	05 December 2024

DECLARATION OF INDEPENDENCE

I, Mpho Ramalivhana, declare that I:

- I act as the independent specialist in this application;
- I have performed the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I have complied with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this report are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.
- Based on information provided to me by the project proponent and in addition to information obtained during the course of this study, have presented the results and conclusion within the associated document to the best of my professional ability;
- As a registered member of the South African Council for Natural Scientific Professions, will undertake my profession in accordance with the Code of Conduct of the Council, as well as any other societies to which I am a member.

Mpho Ramalivhana Pri Sci. Nat (Hons. Bot.; SAAB; SACNASP)

SPECIALIST INFORMATION

Mpho Ramalivhana of Naledzani Environmental Consultant holds an Honours Degree in Botany from the University of Limpopo (Turfloop Campus) and has 13 years' professional experience in biodiversity assessment & management, and aquatic ecological research. He is a registered member for South African Council for Natural Scientist Professions (**400395/14**).

INDEMNITY

This report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken. The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information at the time of study. Therefore, the author reserves the right to modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

Although the author exercises due care and diligence in rendering services and preparing documents, he accepts no liability, and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the author and by the use of this document.

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Name of organization	Vahlengwe Mining Advisory and Consulting
Contact Person	Mulalo Mafunisa
Contact Details	Physical Address: 238 Voster Ave, Glenvista Ext 3 Johannesburg South, 2058 Tel: +2711 432 0062 Email: info@vahlengweadvisory.co.za

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ABBREVIATIONS

a.m.s.l.	above mean sea level
BGIS	Biodiversity Geographic Information System (from SANBI)
CARA	Conservation of Agricultural Resources Act (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CR	Critically Endangered
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMF	Environmental Management Framework
EN	Endangered
ESA	Ecosystem Support Area
GIS	Geographic Information System
HGM	Hydro-geomorphic Approach
MM	Millimetres
KZN	KwaZulu Natal Province
NEMA	National Environmental Management Act (No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (No. 10 of 2004)

NFA	National Forest Act 1998 (Act No. 84 of 1998)
NSBA	National Spatial Biodiversity Assessment
NT	Near Threatened
NWA	National Water Act (Act 36 of 1998)
NWCS	National Wetland Classification System
ONA	Other Natural Area
PA	Protected Area
PES	Present Ecological State
PRECIS	Pretoria Computerised Information System
QDGC	Quarter Degree Grid Cell
SABIF	South African Biodiversity Information Facility
SANBI	South African National Biodiversity Institute
SARCA	Southern African Reptile Conservation Assessment
SFSD	Strategic Framework for Sustainable Development
VM	Virtual Museum
VU	Vulnerable
WULA	Water Use License Application

DEFINITIONS

Alien species - Plant taxa in a given area, whose presence there, is due to the intentional or accidental introduction as a result of human activity

Aquatic ecosystem: ecosystem which provides a medium for habitat by aquatic organisms and sustains aquatic ecological process.

Biodiversity - is the variability among living organisms from all sources including inter alia terrestrial, marine and other aquatic ecosystems and ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems

Buffer zone - The strip of vegetation or land maintained to limit impacts to natural ecosystems from adjoining land use activities.

Biome - a major biotic unit consisting of plant and animal communities having similarities in form and environmental conditions, but not including the abiotic portion of the environment.

Catchment - A catchment is an area where water is collected by the natural landscape. In a catchment, all rain and run-off water eventually flows to a river, wetland, lake or ocean, or into the groundwater system.

Community – an assemblage of populations living in a prescribed area or physical habitat, inhabiting some common environment.

Conservation - the management of the biosphere so that it may yield the greatest sustainable benefit to present generation while maintaining its potential to meet the needs and aspirations of future generations. The wise use of natural resources to prevent loss of ecosystems function and integrity.

Conservation concern - plants of conservation concern are those plants that are important for South Africa's conservation decision making processes and include all plants that are Threatened (see Threatened), Extinct in the wild, Data deficient, near threatened, Critically rare, Rare and Declining. These plants are nationally protected by the National Environmental Management: Biodiversity Act. Within the context of these reports, plants that are provincially protected are also discussed under this heading.

Conservation status - an indicator of the likelihood of that species remaining extant either in the present day or the near future. Many factors are taken into account when assessing the conservation status of a species: not simply the number remaining, but the overall increase or decrease in the population over time, breeding success rates, known threats, and so on.

Critically Endangered - a taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.

Data Deficient - there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. However, "data deficient" is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate.

Declining - a taxon is declining when it does not meet any of the five IUCN criteria and does not qualify for the categories Threatened or Near Threatened, but there are threatening processes causing a continuous decline in the population (Raimondo et al, 2009).

Delineation - Refers to the technique of establishing the boundary of a resource such as a wetland or riparian area.

Ecological Corridors - are roadways of natural habitat providing connectivity of various patches of native habitats along or through which faunal species may travel without any obstructions where other solutions are not feasible

Ecosystem - An ecosystem is essentially a working natural system, maintained by internal ecological processes, relationships and interactions between the biotic (plants & animals) and the non-living or abiotic environment (e.g. soil, atmosphere). Ecosystems can operate at different scales, from very small (e.g. a small wetland pan) to large landscapes (e.g. an entire water catchment area).

Ecosystem Goods and Services - The goods and benefits people obtain from natural ecosystems. Various different types of ecosystems provide a range of ecosystem goods and services. Aquatic ecosystems such as rivers and wetlands provide goods such as forage for livestock grazing or sedges for craft production and services such as pollutant trapping and flood attenuation. They also provide habitat for a range of aquatic biota.

Endangered - taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future

Endemic - naturally only found in a particular and usually restricted geographic area or region

Exotic species - plant taxa in a given area, whose presence there, is due to the intentional or accidental introduction as a result of human activity

Indigenous - any species of plant, shrub or tree that occurs naturally in South Africa

Invasive species - naturalised alien plants that have the ability to reproduce, often in large numbers.

Mitigation - the implementation of practical measures to reduce adverse Impacts

Near Threatened - a Taxon is Near Threatened when available evidence indicates that that it nearly meets any of the five IUCN criteria for Vulnerable, and is therefore likely to qualify for a threatened category in the near future (Raimondo et al, 2009).

Primary Vegetation: this refers to vegetation that has been subject to no or only limited human disturbance, with the retention of the natural topsoil, subsoil and vegetation structure, characteristic species composition (regardless of the level of infestation of alien invasive species), functions and dynamics of that vegetation type, which would not exceed the natural elastic capacity of the ecosystem. Primary vegetation is also referred to as 'indigenous' vegetation, but the term 'primary' is preferred as it distinguishes between historically occurring vegetation and secondary or modified vegetation, which could also consist of indigenous plant species, but not resembling the original vegetation composition, structure or functionality.

Protected Plant - according to Provincial Nature Conservation Ordinances or Acts, no one is allowed to sell, buy, transport, or remove this plant without a permit from the responsible authority. These plants are protected by provincial legislation.

Red Data - a list of species, fauna and flora that require environmental protection - based on the IUCN definitions. Now termed Plants of Conservation Concern

Riparian (area) - Includes the physical structure and associated vegetation within a zone or area adjacent to and affected by surface and subsurface hydrologic features such as rivers, streams, lakes or drainage ways and are commonly associated with alluvial soils.

Species diversity - a measure of the number and relative abundance of species

Species of Conservation Concern: in the context of this report, this refers to species that are currently classified as Threatened (according to the IUCN definitions) as well as species protected under Provincial or National Legislation

Species richness - the number of species in an area or habitat

Threatened - threatened Species are those that are facing a high risk of extinction, indicated by placing in the categories Critically Endangered (CR), Endangered (E) and Vulnerable (VU) (Raimondo et al, 2009)

Transformation - the removal or radical disturbance of natural vegetation, for example by crop agriculture, plantation forestry, mining or urban development.

Vegetation Unit - a complex of plant communities ecologically and historically (both in spatial and temporal terms) occupying habitat complexes at the landscape scale.

Vulnerable - a taxon is Vulnerable when it is not Critically Endangered or Endangered but meets any of the five IUCN criteria for Vulnerable and are therefore facing a high risk of extinction in the wild in the future

Water course - Means a river or spring; a natural channel in which water flows regularly or intermittently: a wetland, lake or dam into which, or from which, water flows: und any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks (National Water Act, 1998).

Wetland - Refers to 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 supports or would support vegetation typically adapted to life in saturated soil (National Water Act, 1998).

1. INTRODUCTION

Naledzani Environmental Services was appointed to conduct a terrestrial and wetland ecology impact assessment for the prospecting right for coal in respect of Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT and Farm Ravine 9201 GT in the Magisterial District of Estcourt District, KwaZulu-Natal Province, as part of the requirements of the Environmental Impact Assessment (EIA) processes. The study aimed at identifying the negative environmental impacts that the proposed prospecting activities may have on the flora, fauna and wetlands found on the site, and subsequently produce a report that entails actions to mitigate such impacts.

A wet season survey was conducted on foot to confirm sensitive receptors that were identified through desktop. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP), as well as the competent authority to enable to provide an informed decision.

1.1. Terms of reference

In order to inform the required regulatory processes, an assessment of the associated terrestrial ecological features and wetland features was required. It is required that the assessment provides technical advice on the following information, applicable to the proposed project on the site: a brief discussion on the vegetation types in which the study area is situated using available literature in order to place the study in context was summarized as follows:

- A broad-scale map of the vegetation of the proposed site;
- A description of the dominant and characteristic species within the broad-scale plant communities;
- A list of red data plant and animal species previously recorded within the site which the study area is situated, obtained from the relevant authorities and literature reviews;
- Identification of sensitive habitats and plant communities;
- Identification and delineation of wetlands within the study site;
- Preliminary investigation of the impacts of the project and the provision of recommended mitigation measures; and

- Identify and assess any cumulative impacts arising from the project where there is major uncertainty, low levels of confidence in predictions and poor data or information. Recommend practicable mitigation measures to minimize or eliminate negative impacts and or enhance potential project benefits.

1.2. Assumptions and limitations

In order to obtain a comprehensive understanding of the dynamics and diversity of the biota on a site, including species of conservation concern, studies should include investigations through the different seasons of the year, over a number of years, and extensive sampling of the area. This is particularly relevant where seasonal limitations to biodiversity assessments exist for the area of the proposed activity. Due to project time constraints inherent with Environmental Authorisation application processes, such long-term research is seldom feasible, and information contained within this report is based on a single field survey conducted during a single season.

The findings, results, observations, conclusions, and recommendations provided in this report are based on the author's best scientific and professional knowledge as well as available information regarding the perceived impacts on wetland and terrestrial environment.

A description of vegetation was based on the physical field surveys and site walkthrough and investigations as performed on site. Limited time was a constraint during field surveys. Results presented in this report are based on a snapshot investigation of the study site and not on detailed and long-term investigations of all environmental attributes and the varying degrees of biological diversity that may be present in the study site.

The wetland delineation as presented in this report is regarded as a best estimate of the wetland boundary based on the site conditions present at the time of assessment. Global Positioning System (GPS) technology is inherently inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur.

Once-off assessments such as this may potentially miss certain ecological information, thus limiting accuracy, detail and confidence. The assessment of impacts and recommendation of mitigation measures were informed by the site-specific ecological issues arising from the field survey and based on the assessor's working knowledge and experience with similar projects.

2. LEGISLATIVE REQUIREMENTS

A summary of the relevant sections of the acts that govern the activities and potential impacts to the environment associated with the development are listed below. It should be noted that these acts are listed below only with specific reference to biodiversity studies.

Table 1: Acts and regulations relating to the project

Legislation/Policy	Description
National Environmental Management: Biodiversity Act No 10 of 2004	The objectives of this act are (within the framework of NEMA) to provide for: • The management and conservation of biological diversity within the Republic of South Africa and of the components of such diversity; • The use of indigenous biological resources in a sustainable manner; • The fair and equitable sharing among stakeholders of the benefits arising from bio prospecting involving indigenous biological resources; • To give effect to ratify international agreements relating to biodiversity which are binding to the Republic; • To provide for cooperative governance in biodiversity management and conservation; and • To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act. This act alludes to the fact that management of biodiversity must take place to ensure that the biodiversity of the surrounding areas is not negatively impacted upon, by any activity being undertaken, in order to ensure the fair and equitable sharing among stakeholders of the benefits arising from indigenous biological resources. Furthermore, a person may not carry out a restricted activity involving either: a) A specimen of a listed threatened or protected species; b) Specimens of an alien species; or c) A specimen of a listed invasive species without a permit.
South African Constitution 108 of 1996	The environment and the health and well-being of people are safeguarded under the Constitution of the Republic of South Africa, 1996 by way of section 24. Section 24(a) guarantees a right to an environment that is not harmful to human health or

	well-being and to environmental protection for the benefit of present and future generations. Section 24(b) directs the state to take reasonable legislative and other measures to prevent pollution, promote conservation, and secure the ecologically sustainable development and use of natural resources (including water and mineral resources) while promoting justifiable economic and social development. Section 27 guarantees every person the right of access to sufficient water, and the state is obliged to take reasonable legislative and other measures within its available resources to achieve the progressive realisation of this right. Section 27 is defined as a socioeconomic right and not an environmental right. However, read with section 24 it requires of the state to ensure that water is conserved and protected and that sufficient access to the resource is provided.
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.
National Environmental Management Act 107 of 1998 and the associated Environmental Impact Assessment (EIA) Regulations	The National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) and the associated Environmental Impact Assessment (EIA) Regulations (GN R326 as amended in 2017 and well as listing notices 1, 2 and 3 (GN R327, R325 and R324 of 2017), state that prior to any development taking place which triggers any activity as listed within the abovementioned regulations, an environmental authorisation process needs to be followed. This could follow either the Basic Assessment process or the Environmental Impact Assessment process depending on the nature of the activity and scale of the impact
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.
Government Notice 864 Alien and Invasive Species Regulations as published in the Government Gazette 40166 of 2016 as it relates to the National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004)	NEMBA is administered by the Department of Environmental Affairs and aims to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA. In terms of alien and invasive species. This act in terms of alien and invasive species aims to: • Prevent the unauthorized introduction and spread of alien and invasive species to ecosystems and habitats where they do not naturally occur, • Manage and control alien and invasive species, to prevent or minimize harm to the environment and biodiversity; and • Eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats. Alien species are defined, in terms of the National Environmental Management: Biodiversity Act, 2004 (Act no 10 of 2004) as: (a) A species that is not an indigenous species; or (b) An indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention. Categories according to NEMBA (Alien and Invasive Species Regulations, 2017): • Category 1a: Invasive species that require compulsory control; • Category 1b: Invasive species that require control by means of an invasive species management programme; • Category 2: Commercially used plants that may be grown in demarcated areas, provided that there is a permit and that steps are taken to prevent their spread; and Category 3: Ornamentally used plants that may no longer be planted.

Conservation of Agricultural Resources Act 43 of 1967	The intention of this Act is to control the over-utilization 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 land owner, including the requirement to remove categorised invasive plants and taking measures to prevent further spread of alien plants.
National Forest Act 84 of 1998 (as amended in September 2011)	Principles to guide decisions affecting forestry resources applicable to land development management are contained in the following principle: **Principle 3** (3) The principles are that: (a) natural forests must not be destroyed save in exceptional circumstances where, in the opinion of the Minister, a proposed new land use is preferable in terms of its economic, social or environmental benefits; (b) a minimum area of each woodland type should be conserved, and forests must be developed and managed to i. conserve biological diversity, ecosystems and habitats; ii. sustain the potential yield of their economic, social and environmental benefits. This section of the Act alludes to the fact that the conservation status of all vegetation types needs to be considered when any development is taking place to ensure that the adequate conservation of all vegetation types is ensured. **Principle 6** (6) Criteria and indicators may include but are not limited to, those for determining the level of maintenance and development of: i. forest resources,

	ii. biological diversity in forests, iii. the health and vitality of forests, iv. the productive functions of forests, v. the protective and environmental functions of forests; and vi. the social functions of forests.
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.
Mining and Biodiversity Guideline	The Mining and Biodiversity Guideline, 2013 (the Guideline) was developed by the Department of Mineral Resources, Department of Mineral Resources, Chamber of Mines, South African National Biodiversity Institute and the South African Mining and Biodiversity Forum, with the intention to find a balance between economic growth and environmental sustainability (i.e. in the name of sustainable development). The Guideline is envisioned as a tool to "foster a strong relationship between biodiversity and mining which will eventually translate into best practice within the mining sector." In identifying biodiversity priority areas which have different levels of risk against mining, the Guideline categorises biodiversity priority areas into 4 classes with the following levels of risk for mining attached to them: 1. Legally protected areas, where mining is prohibited 2. Ares of highest biodiversity importance, which are at the highest risk for mining 3. Areas of high biodiversity importance, which are at a high risk for mining Areas of moderate biodiversity importance, which are at a moderate risk for mining
The protected Areas Act 57 of 2003	The Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and

	local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; and for matters in connection therewith.
The RAMSAR Convention	Emphasis is placed on protecting wetlands and implementing initiatives to maintain or improve the state of wetland resources.
New Partnership for Africa's Development (NEPAD)	Wetland conservation and sustainable use is one of the eight themes under the environment initiative.
The World Summit on Sustainable Development (WSSD)	The Implementation Plan highlights actions that reduce the risk of flooding in drought-vulnerable countries by promoting the restoration and protection of wetlands and watersheds.
The National Water Act 36 of 1998	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) is the primary legislation regulating both the use of water and the pollution of water resources. It is applied and enforced by the Department of Water and Sanitation (DWS). Section 19 of the National Water Act regulates pollution, which is defined as "the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it: • less fit for any beneficial purpose for which it may reasonably be expected to be used; or Harmful or potentially harmful to the welfare, health or safety of human beings; any aquatic or non-aquatic organisms; the resource quality; or property." This Act imposes 'duty of care' on all landowners, to ensure that water resources are not polluted. The following Clause in terms of the National Water Act is applicable in this case: **19 (1**) "*An owner of land, a person in control of land or a person who occupies or uses the land on which (a) any activity or process is or was performed or*

	undertaken; which causes, has caused or likely to cause pollution of a water resource, must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring" Chapter 4 of the National Water Act is of particular relevance to wetlands and addresses the use of water and stipulates the various types of licensed and unlicensed entitlements to the use water. Water use is defined very broadly in the Act and effectively requires that any activities with a potential impact on wetlands (within a distance of 500m upstream or downstream of a wetland) be authorized.
The Mine Health and Safety Act 29 of 1996	The Mine Health and Safety Act 29 of 1996 intends: - to provide for protection of the health and safety of employees and other persons at mines and, for that purpose to promote a culture of health and safety; - to provide for the enforcement of health and safety measures; - to provide for appropriate systems of employee, employer and State participation in health and safety matters; - to establish representative tripartite institutions to review legislation, promote health and enhance properly targeted research; - to provide for effective monitoring systems and inspections, investigations and inquiries to improve health and safety; - to promote training and human resources development; - to regulate employers' and employees' duties to identify hazards and eliminate, control and minimise the risk to health and safety; - to entrench the right to refuse to work in dangerous conditions; and to give effect to the public international law obligations of the Republic relating to mining health and safety.

Other legislation includes

- KwaZulu-Natal Nature Conservation Management Act (Act 9 of 1997); and
- KwaZulu-Natal Planning and Development Act (Act 6 of 2008).

3. DESCRIPTION OF THE RECEIVING ENVIRONMENT

3.1. Location

The proposed prospecting right area is located on the respect of Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT and Farm Ravine 9201 GT in the Magisterial District of Estcourt District, KwaZulu-Natal Province. The site is situated 36,63 km East south of Ladysmith town and 29,60 km East south of Umbulwana Village and access road to the farm is via the R74 road, in the Estcourt District in KwaZulu Natal Province. See figures 1 and 2 below

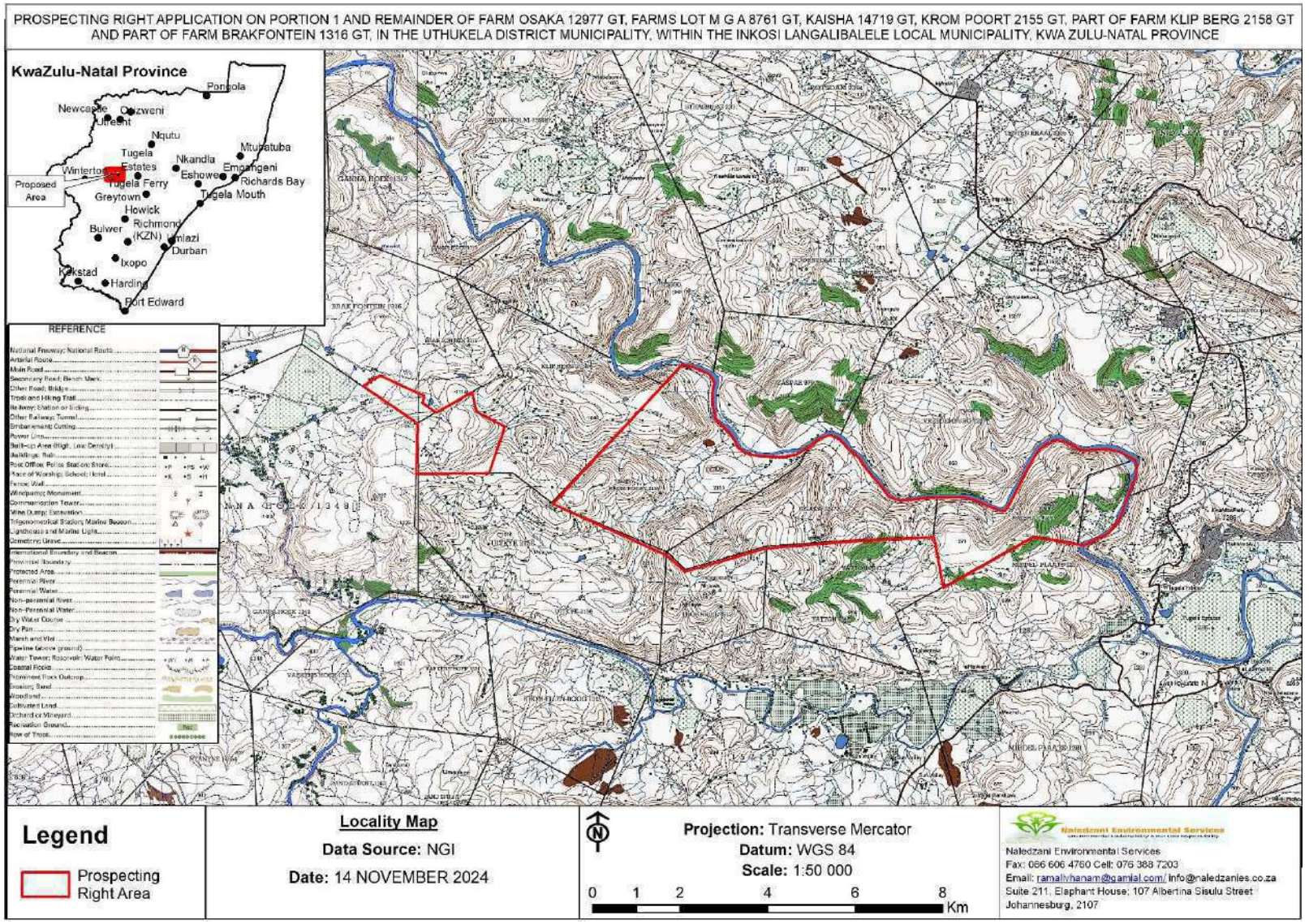


Figure 1: Locality map for the project area

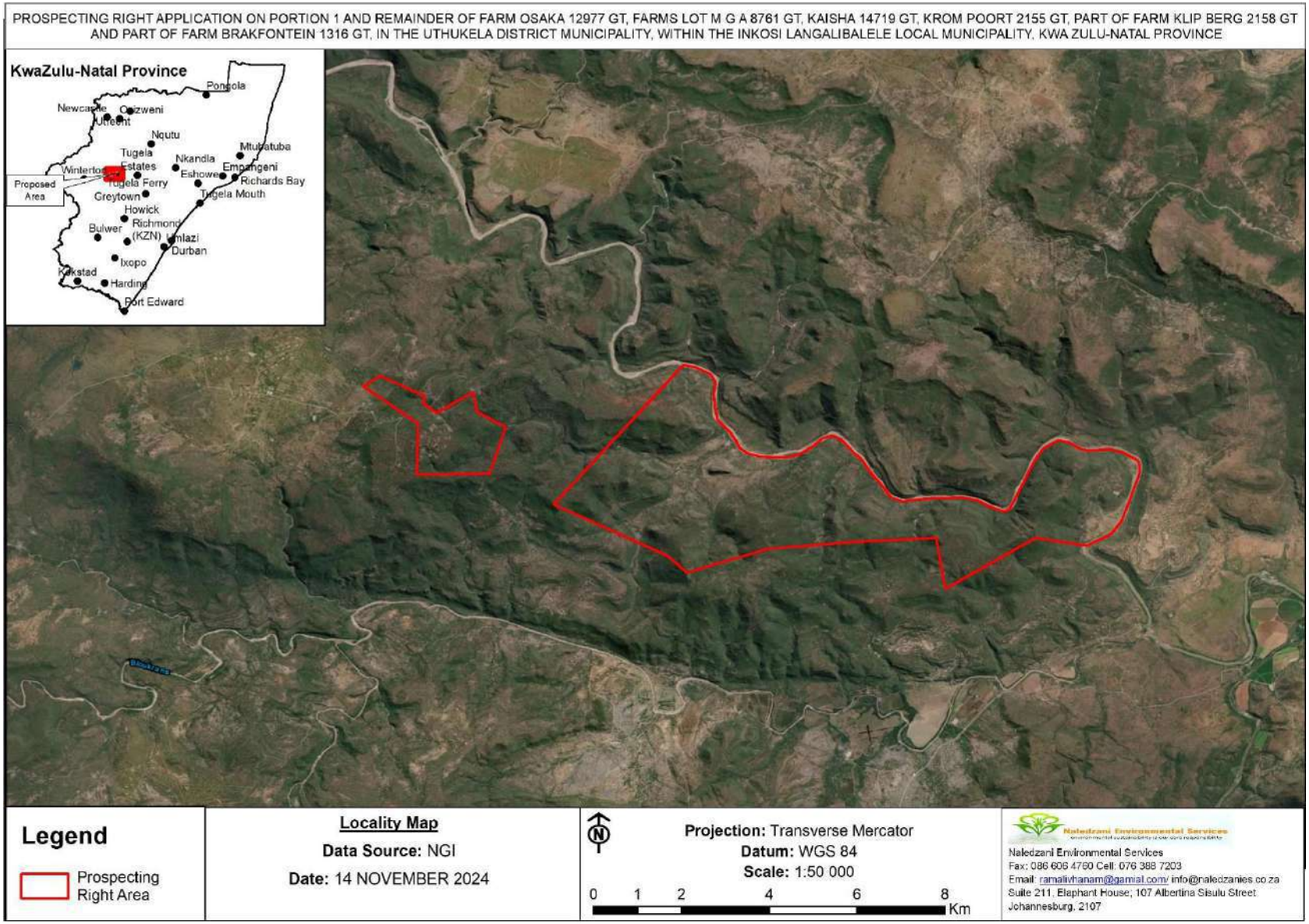


Figure 2: Google-earth view of the project area

3.2. Climate

The project area falls within the range of the Umnambithi (Ladysmith) weather station, which is located in the southern hemisphere. The climatic conditions in Umnambithi are categorized as warm and temperate, with summers much rainier than winters. The climate is classified as Subtropical highland climate or Monsoon-influenced temperate oceanic climate (Cwb) by the Köppen-Geiger system (Köppen & Geiger, 1936). The average annual temperature is 17.3 °C whereas the annual precipitation is about 1057 mm. The town of Umnambithi is located in the southern hemisphere, where summer begins towards the conclusion of January and ends in December. January is the warmest month of the year with an average temperature of 21.6 °C whereas July is the coldest month with an average minimum temperature of 10.8 °C. The month with the highest relative humidity is February (45.53 %) while the month with the lowest relative humidity is August (45.53 %). The month with the rainiest days is December (18.83 days) while the month with the least rainy days is July (2.47 days). The occurrence of wind in the area is high, with the strong winds blowing constantly from December to April and calm winds from June to October. Both the frequency and velocity of these winds are highest in these directions.

3.3. Geology

The proposed prospecting right area falls under the Vryheid Formation, and is part of the Ecca Group, which is one of the major subdivisions of the Karoo Supergroup. The area typically features sandy soils. The Vryheid Formation is characterized by a variety of sedimentary rocks, including sandstones, siltstones, shales, and coal seams. The soils overlying this formation are diverse, reflecting the underlying lithology and the region's depositional history. Managing these soils for agriculture and mitigating the environmental impacts of mining are key considerations in the area.

3.4. Vegetation classification

According to the new vegetation classification on National Vegetation Types Map on BGIS (2012), the proposed site is located within the Thukela Thornveld and the Thukela Valley Bushveld (Covering a bigger portion of the proposed area) of the Savanna Biome.

3.5. Overview of the Biome type

Mucina and Rutherford (2018) described the project area as falling within the Savanna biome. The Savanna Biome is the largest Biome in southern Africa, occupying 46% of its area, and over one-third the area of South Africa. It is well developed over the Lowveld and Kalahari region of South Africa and is also the dominant vegetation in neighbouring Botswana, Namibia and Zimbabwe. It is characterized by a grassy ground layer and a distinct upper layer of woody

plants. Where this upper layer is near the ground vegetation may be referred to as Shrubveld, where it is dense as Woodland, and the intermediate stages are locally known as Bushveld.

The environmental factors delimiting the biome are complex: altitude ranges from sea level to 2000 m; rainfall varies from 235 to 1000 mm per year; frost may occur from 0 to 120 days per year; and almost every major geological and soil type occurs within the biome. A major factor delimiting the biome is the lack of sufficient rainfall which prevents the upper tree layer from dominating, coupled with fires and grazing, which keep the grass layer dominant. Summer rainfall is essential for grass dominance, which, with its fine material, fuels near-annual fires. In fact, almost all species are adapted to survive fires, usually with less than 10% of plants, both in the grass and tree layer, killed by fire. Even with severe burning, most species can re-sprout from the stem bases (Mucina and Rutherford, 2018).

The grass layer is dominated by C 4-type grasses (C4 plants are more adapted to warm or hot seasonal conditions under moist or dry environments), which are at an advantage where the growing season is hot. But where rainfall has a stronger winter component, C 3-type grasses dominate. The shrub-tree layer may vary from 1 to 20 m in height, but in Bushveld typically varies from 3 to 7 m. The shrub-tree element may come to dominate the vegetation in areas which are being overgrazed.

Most of the Savanna vegetation types are used for grazing, mainly by cattle or game. In the southernmost Savanna types, goats are a major stock. In some areas crops and subtropical fruit are cultivated. These mainly include the Clay Thorn Bushveld, parts of Mixed Bushveld, and Sweet Lowveld Bushveld.

Conservation status of Savanna is comparatively good, mainly due to the presence of the Kruger and Kalahari Gemsbok National Parks within the biome. However, the high area conserved in South Africa, belies the fact that half of Savanna vegetation types are inadequately conserved, in having less than 5% of their area in reserves and, much of the area is used for game-farming and can thus be considered effectively preserved, provided that sustainable stocking levels are maintained. The importance of tourism and big game hunting in the conservation of the area must not be underestimated (Mucina and Rutherford, 2018).

3.6. Broad vegetation of the site

Based on the new vegetation classification on National Vegetation Types Map on BGIS (2012), the proposed site is located within the Thukela Valley Bushveld (SVs 1) (Covering a bigger portion of the proposed area) and the Thukela Thornveld (SVs 2).

- **Thukela Valley Bushveld (SVs 1)**

The Thukela Valley Bushveld vegetation unit is distributed in the KwaZulu-Natal Province: Central Thukela River basin upstream of Jameson's Drift, past Tugela Ferry to about 20 km southeast of Ladysmith. Also in valleys of several major tributaries, such as the lower Mooi, Bushmans, Buffels and Sundays Rivers. Altitude on this vegetation unit normally ranges from about 350 to1 000 m.

It occurs often on rocky rugged slopes and terraces mainly with deciduous trees of short to medium height (and many large shrubs) including *Acacia tortilis, A. nilotica and A. natalitia* and prominent evergreen species such as *Olea europaea subsp. africana, Boscia albitrunca and Euclea crispa i*n places. Succulent plants, mainly species of Euphorbia and Aloe occur on shallow and eroded soils. Relatively limited areas are dominated by succulents such as *E. tirucalli* (some hillsides south of the Thukela) and *E. ingens* on steep slopes, but also commonly on the valley floor.

The vegetation unit is regarded as Least threatened with a conversation target of 25%. Statutorily conserved (less than 2000 ha) in the Weenen Game Reserve. This vegetation unit has undergone considerable degradation over

almost its entire area. In the many eroded areas, prolonged continuous overgrazing has led to the complete destruction of the grass cover. Often the only ground cover is found under *Acacia tortilis* trees where their root systems retain soil, the trees act as nutrient pumps and provide shade (Camp 1999e). Erosion very variable, ranging from very low to very high. Alien plants include the widely scattered *Opuntia imbricata*.

- **Thukela Thornveld**

Thukela Thornveld is found mainly in KwaZulu-Natal from the upper Thukela River basin, fringing the Thukela Valley Bushveld on its upper border in a series of discontinuous patches. It is most prominent in the area east of Estcourt–Colenso, and including Ladysmith with some outliers on slopes south of Dundee. It occupies landscapes consisting of valley slopes to undulating hills. The vegetation is Vachellia-dominated bushveld of variable density, ranging from wooded grassland to dense thickets, with dense grassy undergrowth. The current conservation status of Thukela Thornveld is regarded as of Least Concern, with erosion and possibly urbanisation currently the biggest threat. Statutorily conserved (less than 1 500 ha) in Weenen Game Reserve and Isandlwana Nature Reserve. About 5% already transformed, mainly by cultivation. Erosion somewhat less than in SVs1 Thukela Valley Bushveld.

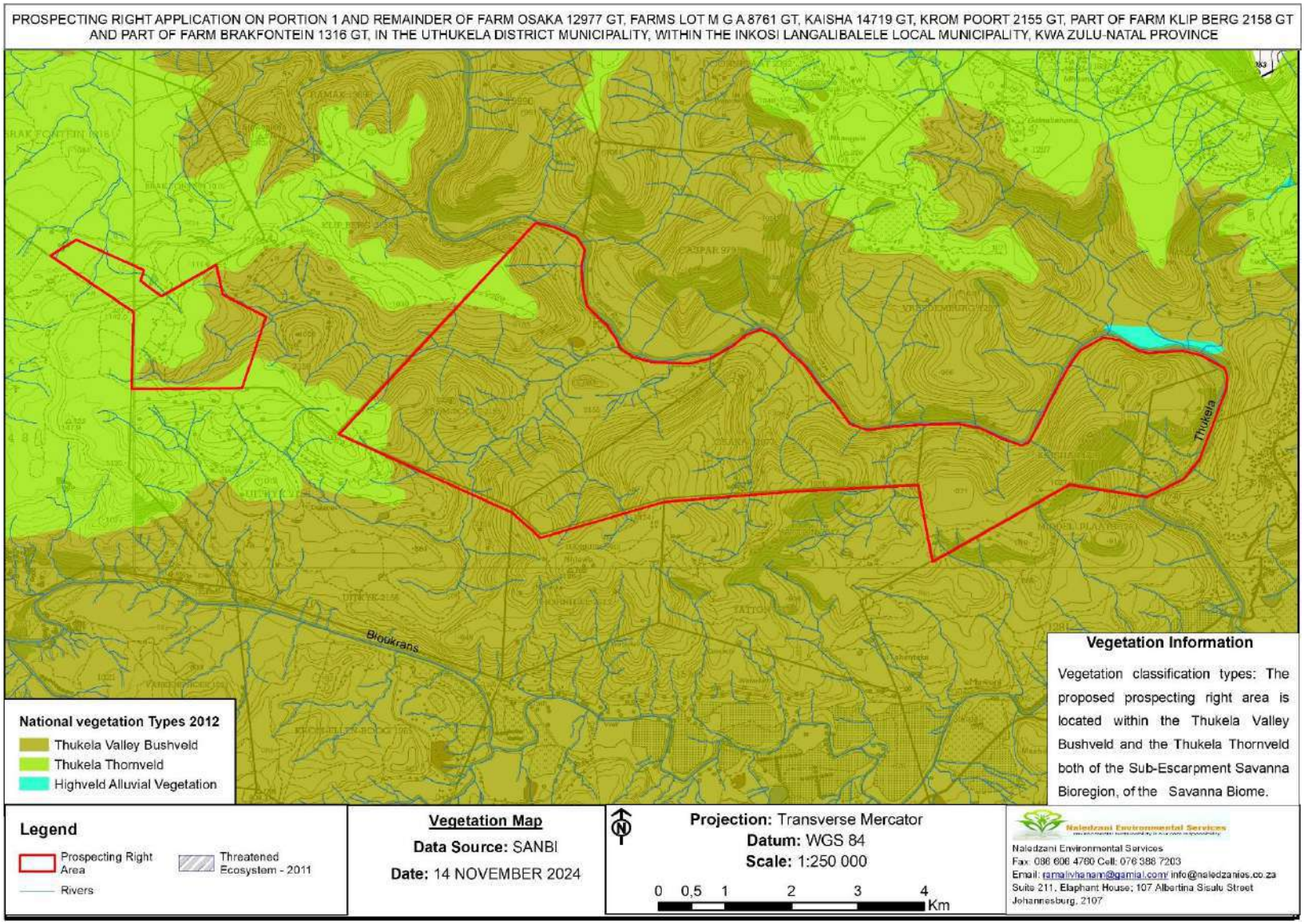


Figure 3: Broad vegetation map for the site

3.7. 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:

- Irreversible loss of natural habitat;
- Ecosystem degradation and loss of integrity;
- Limited extent and imminent threat;
- Threatened plant species associations;
- Threatened animal species associations; and
- Priority areas for meeting explicit biodiversity targets as defined in a systematic conservation plan.

In terms of section 52 (1) (a), of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), 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 classified all threatened or protected ecosystems in South Africa in terms of four categories; *Critically Endangered* (CR), *Endangered* (EN), *Vulnerable* (VU), or *Protected*. The purpose of categorizing these ecosystems is to prioritize conservation areas in order 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 critically endangered and endangered ecosystems accounting for 2.7%, and vulnerable 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), Environmental Impact Assessments (EIAs) and other environmental applications (Mucina *et al.,* 2006*)*. According to data sourced from South African National Biodiversity Institute (SANBI), the area is located within the **Least Threatened Ecosystem**.

However, it is acknowledged that it is important to ground-truth the presence of indigenous vegetation of the ecosystem in question, as spatial data on the location of ecosystems and on land cover is always subject to errors of scale, and land cover data generated should never be regarded as 100% accurate. It is further stated within Government Notice 1002 of 2011 that "if any development that requires environmental authorisation impacts on a Threatened ecosystem, that impact should be avoided, minimized, mitigated and/or offset as appropriate.

3.8. Important Bird and Biodiversity Areas

Due to South Africa's high levels of habitat diversity, the country contains more than 840 avian species, encompassing approximately 7% of the world's avifauna (Fishpool & Evans, 2001). Various sites within the country have been identified as important for maintaining viable populations of endemic, range restricted and Threatened species. The primary aim of the Important Bird Areas program is to ensure the long-term conservation of important avifaunal habitats. They also provide essential benefits to people, such as food, materials, water, climate regulation and flood attenuation, as well as opportunities for recreation and spiritual fulfilment. By conserving IBAs, all the ecosystem goods and services they provide are preserved, which means in effect that a meaningful component of the South African economy (such as water management and agriculture) is supported (Marnewick et al., 2015a). Since the late 1970s, more than 12 000 IBAs have been identified in virtually all of the world's countries and territories, both on land and at sea. In 1998, 122 South African IBAs were identified and listed, with this inventory being revised to 112 IBAs in 2015 (Marnewick et al., 2015b). IBAs have also had considerable and increasing relevance when responses have been developed to a number of wider environmental issues, such as habitat loss, ecosystem degradation, climate change and the sustainable use of resources (Marnewick et al., 2015a). According to BirdLife South Africa, one-third of the 112 IBAs located within South Africa are under threat by invasive alien vegetation, habitat modification/degradation and agricultural expansion (Marnewick et al., 2015). Further to this, 52% of IBAs fall outside formally Protected Areas, further complicating avian habitat conservation. Based on the current delineation of IBAs in South Africa, the present study area is not associated with or in close proximity to any IBAs.

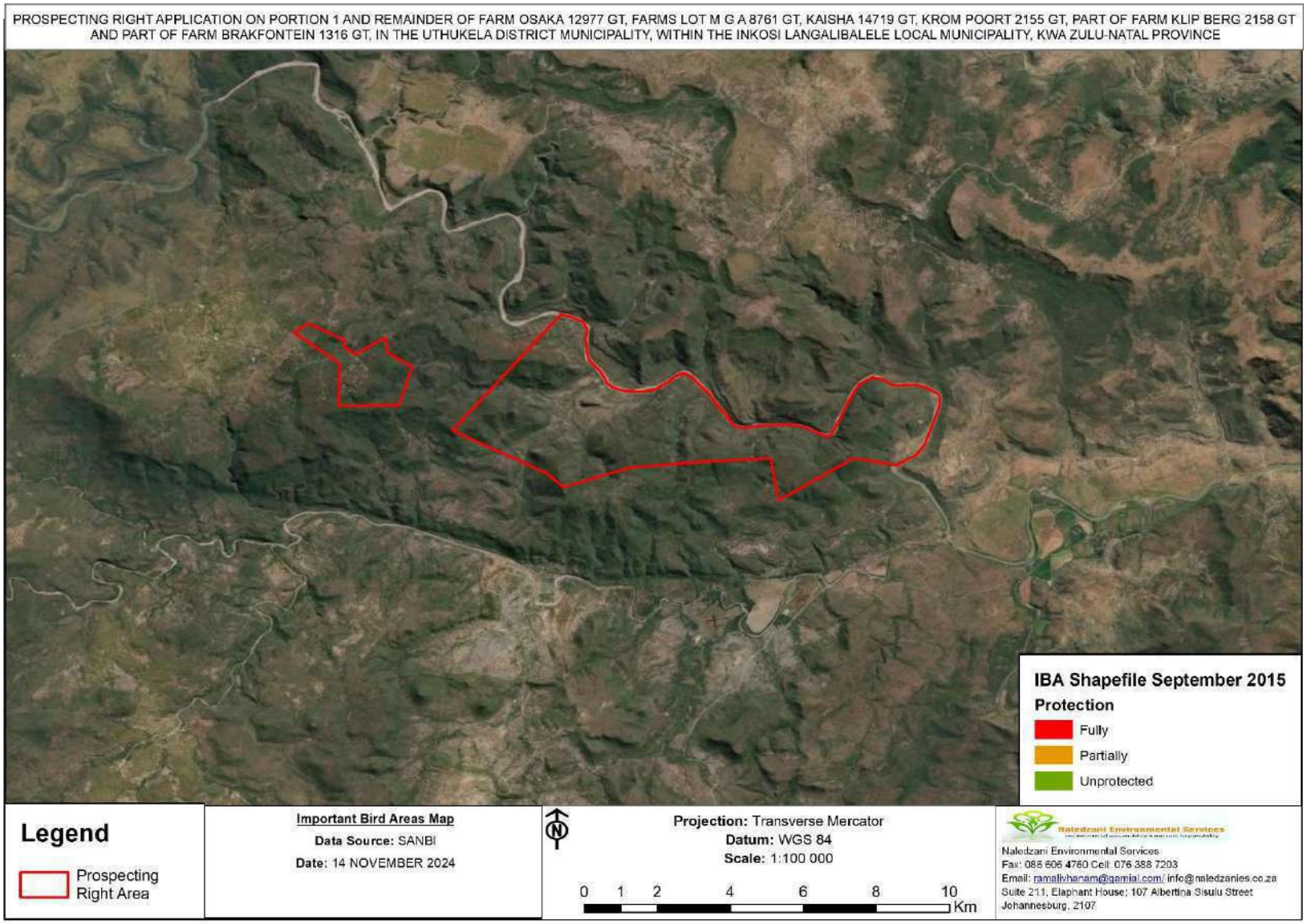


Figure 4: IBA map for the area

3.9. Land Use and Land Cover

Currently the majority portion of the site is still natural dominated by dense and open woodland. Other land uses include settlements (sparsely populated) old cultivated areas, subsistence agricultural field as well as non-perennial streams

Figure 5: Dominating dense closed as open woodlands

Figure 6: Fallow lands

Figure 7: Some of the houses within the project area

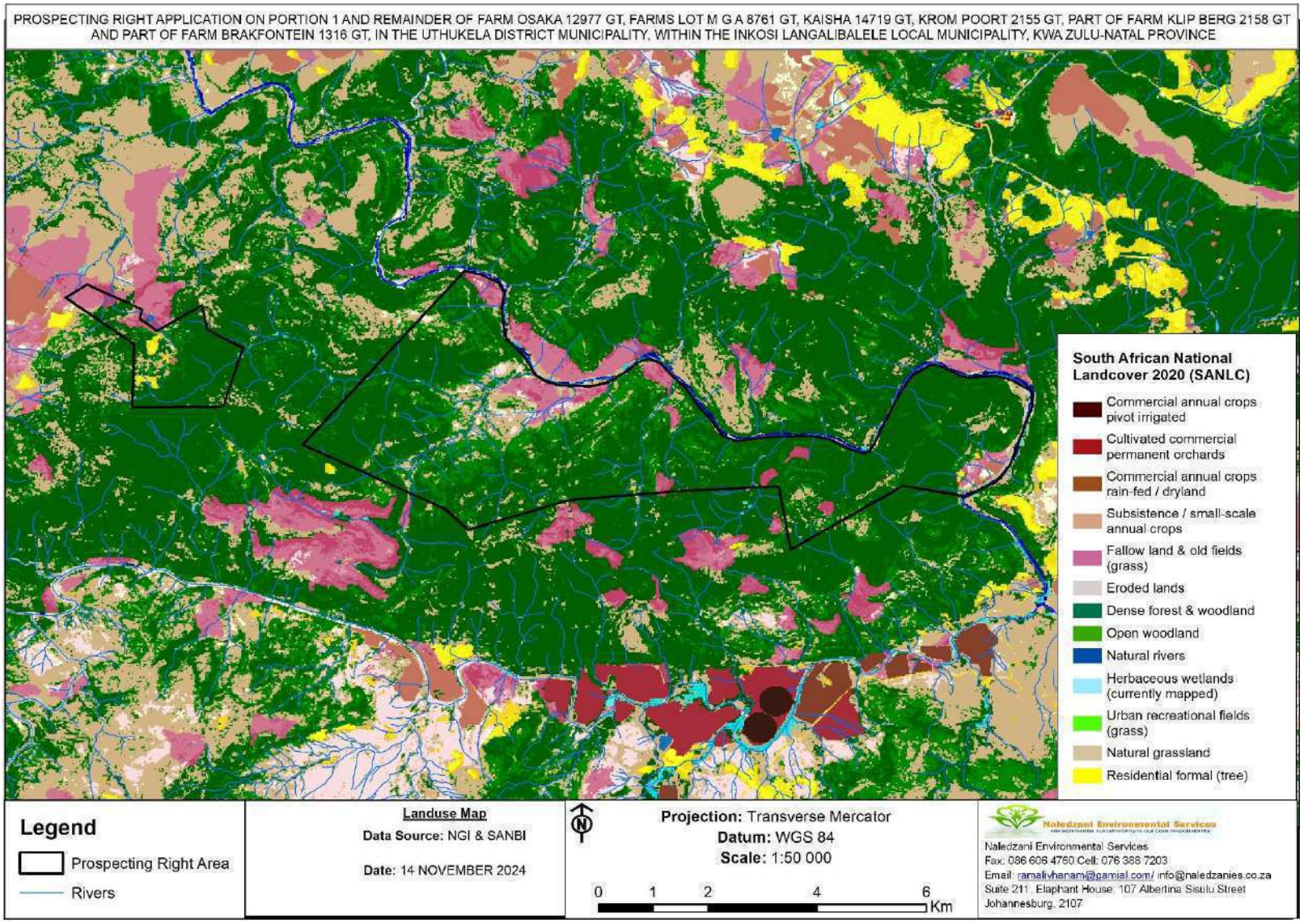


Figure 8: Land use of the site

4. METHODOLOGY AND REPORTING

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 regarding 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 taken into account are detailed below:

4.1. General

A desktop survey utilising aerial images and photography was undertaken to assemble background information regarding the different features and vegetation type present within the proposed project footprint including the buffer area. The sites were then assessed on the 04th June 2024 in order to record the true floristic reflection of the sites as well as wetlands in the study area.

4.2. Vegetation

The PRECIS list of plants recorded in the quarter degree grid squares were obtained from SANBI. This list was consulted to verify the record of occurrence of the plant species seen on the site. A desk-top study of the habitats of the red-listed and orange-listed species known to occur in the area was done prior to site assessment. The vegetation types of Mucina & Rutherford (2012) were also used as reference but where necessary communities are named according to the recommendations for a standardized South African syntaxonomic nomenclature system (Brown, L.R., Du Preez, P.J., Bezuidenhout, H., Bredenkamp, G.J., Mostert, T.H.C., and Collins, N.B. 2013). By combining the available literature, stratification of vegetation communities was possible.

4.3. Fauna survey

The majority of mammals and reptiles are either very secretive, nocturnal, hibernate (reptiles), migrate (birds) or prefer specific habitat so sampling and identification was limited.

4.4. Mammals

Records of all mammal species recorded in the quarter degree grid squares were obtained from the Virtual Museum (VM) website of the Animal Demographic Unit of University of Cape Town prior to the site visits. The site assessment

was conducted for mammal species diversity by direct and indirect methods using mammal sightings, burrows, holes and also verified by mammal book (Skinner and Chimimba, 2005). No trapping was conducted during the field survey.

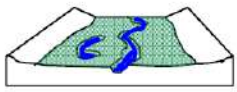
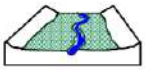
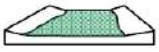
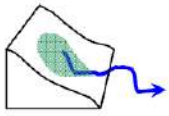
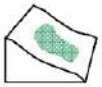
4.5. Wetland assessment

The classification of the wetland in the study area was based on the WET-EcoServices technique (Kotze et al, 2005). The WET-EcoServices technique identifies seven main types of wetlands based on the hydro-geomorphic characteristics. The field procedure for the wetland delineation was conducted according to the Guidelines for delineating the boundaries of a wetland (South African Water Act, DWAF, 1999). Due to the transitional nature of wetland boundaries, these are often not clearly apparent and the delineations should therefore be regarded as a human construct. The delineations are based on scientifically defensible criteria and are aimed at providing a tool to facilitate the decision making process regarding the assessment of the significance of impacts that may be associated with the proposed project.

4.6. Wetland classification and delineation

The classification of the wetland in the study area was based on the WET-EcoServices technique (Kotze *et al*, 2005). The WET-EcoServices technique identifies seven main types of wetlands based on the hydro-geomorphic characteristics (*See table 2 below*).

Table 2: Wetland hydrogeomorphic (HGM) types typically supporting inland wetlands in South Africa (Adapted from Kotze et al, 2005)

HYDRO-GEOMORPHIC TYPES	DESCRIPTION	SOURCE OF WATER MAINTAINING THE WETLAND[1]	
		SURFACE	SUB-SURFACE
Floodplain 	Valley bottom areas with a well defined stream channel, gently sloped and characterized by floodplain features such as oxbow depressions and natural levees and the alluvial (by water) transport and deposition of sediment, usually leading to a net accumulation of sediment. Water inputs from main channel (when channel banks overspill) and from adjacent slopes.	***	*
Valley bottom with a channel 	Valley bottom areas with a well defined stream channel but lacking characteristic floodplain features. May be gently sloped and characterized by the net accumulation of alluvial deposits or may have steeper slopes and be characterized by the net loss of sediment. Water inputs from main channel (when channel banks overspill) and from adjacent slopes.	***	*/ ***
Valley bottom without a channel 	Valley bottom areas with no clearly defined stream channel, usually gently sloped and characterized by alluvial sediment deposition, generally leading to a net accumulation of sediment. Water inputs mainly from channel entering the wetland and also from adjacent slopes.	***	*/ ***
Hillslope seepage linked to a stream channel 	Slopes on hillsides, which are characterized by the colluvial (transported by gravity) movement of materials. Water inputs are mainly from sub-surface flow and outflow is usually via a well defined stream channel connecting the area directly to a stream channel.	*	***
Isolated Hillslope seepage 	Slopes on hillsides, which are characterized by the colluvial (transported by gravity) movement of materials. Water inputs mainly from sub-surface flow and outflow either very limited or through diffuse sub-surface and/or surface flow but with no direct surface water connection to a stream channel.	*	***
Depression (includes Pans) 	A basin shaped area with a closed elevation contour that allows for the accumulation of surface water (i.e. it is inward draining). It may also receive sub-surface water. An outlet is usually absent, and therefore this type is usually isolated from the stream channel network.	*/ ***	*/ ***

[1] Precipitation is an important water source and evapotranspiration an important output in all of the above settings

Water source: * Contribution usually small

*** Contribution usually large

*/ *** Contribution may be small or important depending on the local circumstances

Wetland

The field procedure for the wetland delineation was conducted according to the Guidelines for delineating the boundaries of a wetland (South African Water Act, DWAF, 1999). Due to the transitional nature of wetland boundaries, these are often not clearly apparent and the delineations should therefore be regarded as a human construct. The delineations are based on scientifically defensible criteria and are aimed at providing a tool to facilitate the decision making process regarding the assessment of the significance of impacts that may be associated with the proposed developments.

4.7. Hydrological assessment

The hydrological health of the stream and the wetlands was determined using the WET-Health (2008) techniques. The following changes were considered:

- Changes to water input volumes and pattern (effects of alteration in the upstream catchment).
- Changes to the water distribution and retention patterns of water passing through the wetland (effects of on-site alterations).

Table 3: Hydrological assessment criteria (Adapted from WET-Health, 2008:50)

Reduced flows	
Alteration classes	**Description**
Negligible (0 to 0.9)	None or negligible reduction in flow
Small (-1 to -1.9)	Identifiable but small reduction in flow (e.g. 5% of the catchment under plantation forestry or 2% of the catchment irrigated with good conservation measures being applied)
Moderately small (-2.0 to -3.9)	Moderately small reduction in flows (e.g. 20% of the catchment under plantation forestry or 10% of the catchment irrigated with good conservation measures being applied)
Intermediate (-4 or -5.9)	Intermediate reduction in flows (e.g. Approximately 40% of the HGM's catchment under plantation forestry, with trees outside of the riparian areas)
Moderately large (-6 to -7.9)	Moderately large reduction in flows (e.g. approximately 55% of the catchment with eucalyptus trees)
Large (-8 to -9)	Large reduction in flows (e.g. approximately 7% of the catchment planted with Eucalyptus trees)

Very large (>-9)	Very large reduction in flows, usually >75% reduction (e.g. entire catchment completely planted with eucalyptus trees or a very high level of abstraction of water from the catchment for irrigation)

Table 4: Guideline for assessing the intensity of impact of modifications to an existing channel (Adapted from WET-Health, 2008:66)

Intensity of impact	**Impact category description**
None (0.5)	No discernible modifications to the natural stream channel
Small (1.5)	Although identifiable, the impacts of any modifications to the natural stream channel are small (e.g. as a result of sight increase in cross sectional area, decrease in stream length or reduction in surface roughness of the channel)
Moderate (3)	Modifications to the natural stream channel have a moderate impact (e.g. As a result of an intermediate increase in cross sectional area, decrease in stream length or intermediate reduction in surface roughness of the channel; usually with a low to intermediate dependency of the HGM unit on the bank overspill)
Large (5)	Modifications to the natural stream channel have a large impact (e.g. As a result of a moderately high increase in cross sectional area or decrease in stream length or an intermediate to high dependency of the HGM unit on bank overspill)
Serious (7)	Modifications to the stream channel have a serious impact (usually a result of a combination of high modifications to 2 or 3 of the factors or a considerable increase in cross sectional area) but some overtopping probably still occurs, although much less frequently than was the case naturally. There should be a high dependency of the HGM unit on the bank overspill.
Critical (9)	Modifications to the natural stream have a critical impact (i.e. modifications are so great that no over-topping of the channel ever takes place; and with a high dependency of the HGM unit on the bank overspill).

4.8. PES methodology

The Present Ecological Status (PES) Method (DWAF 1999) was used to attempt to establish the integrity of the wetlands in the study area and was based on the modified Habitat Integrity approach developed by Kleynhans (1999,

in DWAF 1999). The delineated wetland units were assessed as a whole due to the inability to access all areas. A broad assessment of the PES of all wetlands in the study area is therefore presented. Table 5 shows the criteria for assessing the habitat integrity of palustrine wetlands along with Table 6 describing the allocation of scores to attributes and the rating of confidence levels associated with each score. These criteria were selected based on the assumption that anthropogenic modification of the criteria and attributes listed under each selected criterion can generally be regarded as the primary causes of the ecological integrity of a wetland.

Table 5: Habitat integrity assessment criteria for palustrine wetlands

Criteria and attributes	Relevance
Flow Modification	Consequence of abstraction or regulation by impoundments. Changes in the temporal and spatial characteristics of flow can have an impact on habitat attributes such as an increase in duration of low flow season, resulting in low availability of certain habitat types or water at the start of the breeding, flowering or growing season.
Permanent Inundation	Consequence of impoundment resulting in destruction of natural wetland habitat and cues for wetland biota.
Water Quality Modification	Originates from point or diffuse sources. Measure directly by laboratory analysis or assessed indirectly from upstream agricultural activities, human settlements and industrial activities. Aggravated by volumetric decrease in volume of water during low or no flow condition
Sediment Load Modification	Consequence of reduction due to entrapment by impoundments or increase due to land use practices such as overgrazing. Cause of unnatural rates of erosion, accretion or infilling of wetlands and change in habitats.
Canalization	Results in desiccation or changes to inundation patterns of wetland and thus changes in habitats. River diversions or drainage.

Criteria and attributes	Relevance
Topographic Alteration	Consequence of infilling, ploughing, dykes, trampling, bridges, roads, railway lines and other substrate disruptive activity which reduces or changes wetland habitat directly or through changes in inundation patterns.
Alien/Exotic macrophytes	Alteration of habitat by obstruction of flow and may influence water quality. Dependent upon the species involved and scale of infestation.
Alien/Exotic aquatic fauna	The disturbance of the stream bottom during feeding may influence the water quality and increase turbidity. Dependent upon the species involved and their abundance
Solid waste disposal	A direct anthropogenic impact which may alter habitat structurally. Also, a general indication of the misuse and mismanagement of the river
Vegetation removal	Impairment of the buffer the vegetation forms to the movement of sediment and other catchment runoff products into the river. Refers to physical removal for farming, firewood and overgrazing.
Exotic vegetation encroachment	Excludes natural vegetation due to vigorous growth, causing bank instability and decreasing the buffering function of the riparian zone. Allochtonous organic matter input will also be changed. Riparian zone habitat diversity is also reduced
Over utilisation of biota	Overgrazing, Over-fishing, etc.

Table 6: Scoring guidelines and relative confidence scores for the habitat integrity assessment for palustrine wetlands (DWAF, 1999).

Scoring guideline per attribute	Score

Natural, unmodified	5
Largely natural	4
Moderately modified	3
Largely modified	2
Seriously modified	1
Critically modified	0
Relative confidence of score	**Score**
Very high confidence	4
High confidence	3
Moderate confidence	2
Marginal/ low confidence	1

Table 7 provides guidelines for the determination of the Present Ecological Status Category (PESC), based on the mean score determined for Table 5. This approach is based on the assumption that extensive degradation of any of the wetland attributes may determine the PESC (DWAF, 1999).

Table 7: Category's assigned to the scores achieved in the wetland habitat assessment (Kleynhans, 1999; DWAF, 1999).

Category	Mean	Score category description
A	>4	Unmodified or approximated natural condition.

B	>3 and ≤ 4	Largely natural with few modifications, but with some loss of natural habitats.
C	>2 and ≤ 3	Moderately modified, but with some loss of natural habitats.
D	2	Largely modified. A large loss of natural habitats and basic ecosystem functions has occurred.
E	> 0 and < 2	Seriously modified. The losses of natural habitats and basic ecosystem functions are extensive.
F	0	Critically modified. Modifications have reached a critical level and the system has been modified completely with an almost complete loss of natural habitat.

4.9. EIS methodology

The following method is outlined in Appendix W5 of DWAF (1999). A series of determinants for EIS (Table 8) are assessed on a scale of 0 to 4, where 0 indicates no importance and 4 indicates very high importance. The method is used as a guideline for the professional judgement of individuals familiar with an area and its wetlands. The relative confidence of each rating is estimated based on a scale of four categories as indicated in Table 9.

Table 8: Score sheet for determining EIS.

Determinant	Score	Confidence
Rare and Endangered Species.		
Populations of Unique Species.		

Species/taxon Richness.		
Diversity of Habitat Types or Features.		
Migration route/breeding and feeding site for wetland species.		
Sensitivity to Changes in the Natural Hydrological Regime.		
Sensitivity to Water Quality Changes.		
Flood Storage, Energy Dissipation and Particulate or Element Removal.		
Protected Status.		
Ecological Integrity.		
Total		
Median		
Overall ESI		

Table 9: Scoring guidelines and relative confidence scores for the habitat integrity assessment for palustrine wetlands (DWAF, 1999).

Scoring guideline per attribute	**Score**
Very high	4
High	3
Moderate	2
Marginal/low	1
None	0

Relative confidence of score	Score
Very high confidence	4
High confidence	3
Moderate confidence	2
Marginal/ low confidence	1

The median score for the biotic and habitat determinants is interpreted and translated into an Ecological Management Class (EMC) as indicated in Table 10. If the EIS Class indicates a higher EMC value than the Present Ecological Status Category (PESC) then a well-motivated decision may be taken to peg the Reserve on the higher EMC. The EMC can be set equivalent to, but not below the PES Class.

Table 10: Ecological importance and sensitivity categories. Interpretation of median scores for biotic and habitat determinants into an EMC.

Ecological Importance and Sensitivity Category (EIS)	Range of Median	Recommended Ecological Management Class (EMC)
Very high Wetlands/Floodplains that are considered ecologically important and sensitive on a national or even international level. The biodiversity of these floodplains is usually very sensitive to flow and habitat modifications. They play a major role in moderating the quantity and quality of water of major rivers.	>3 and ≤4	A
High Wetlands/Floodplains that are considered to be ecologically important and sensitive. The biodiversity of these floodplains may	>2 and ≤3	B

be sensitive to flow and habitat modifications. They play a role in moderating the quantity and quality of water of major rivers.		
Moderate Wetlands/Floodplains that are considered to be ecologically important and sensitive on a provincial or local scale. The biodiversity of these floodplains is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water of major rivers.	>1 and ≤2	C
Low/marginal Wetlands/Floodplains that is not ecologically important and sensitive at any scale. The biodiversity of these floodplains is ubiquitous and not sensitive to flow and habitat modifications. They play an insignificant role in moderating the quantity and quality of water of major rivers.	>0 and ≤1	D

4.10. ES methodology

The assessment of the ecosystem services supplied by the identified wetlands was conducted according to the guidelines as described by Kotze et al (2009). A Level 2 assessment was undertaken which examines and rates the following services:

- Flood attenuation.
- Stream flow regulation.
- Sediment trapping.
- Phosphate trapping.
- Nitrate removal.
- Toxicant removal.
- Erosion control.
- Carbon storage.

- Maintenance of biodiversity.
- Water supply for human use.
- Natural resources.
- Cultivated foods.
- Cultural significance.
- Tourism and recreation.
- Education and research.

These characteristics were scored according to the following general levels of services provided in Table 11:

Table 11: Levels of ecosystem service ratings.

Service rating score	Service rating category
0	Low
1	Moderately low
2	Intermediate
3	Moderately high
4	High

4.11. Aerial assessment

The aerial assessment was conducted using Google earth images and BGIS software. The purpose of this desktop assessment was to see whether any physical features that would be associated with a stream channel or wetland area was present on the site.

4.12. Soil assessment

The colours of soil components are often the most diagnostic indicator of hydromorphic soils DWAF (2005). Colours of these components are strongly influenced by the frequency and duration of soil saturation. Generally, the higher the

duration and frequency of saturation in a soil profile, the more prominent grey colours become in the soil matrix DWAF (2005).

Coloured mottles/ redoximorphic features (soils with variegated colour patters are described as being mottled, with the "background colour" referred to as the matrix and the spots or blotches of colour) are a prominent feature of hydromorphic soils. These features are usually absent in permanently saturated soils, and are at their most prominent in seasonally saturated soils, becoming less abundant in temporarily saturated soils until they disappear in dry soils DWAF (2005).

Hydromorphic soils must display signs of wetness within 50cm of the soil surface (DWAF, 2005). This depth has been chosen due to international experience showing that frequent saturation of the soil within 50cm of the surface is necessary to support hydrophilic vegetation (DWAF, 2005).

According to Collins (2005), the presence or absence of redoximorphic features [features formed by the process of reduction, translocation and oxidation of Iron (Fe) and manganese (Mn) oxides] within the upper 50cm of the soil profile is sufficient enough to identify a hydric soil (soil that has been depleted of oxygen through the chemical process of reduction).

The soil assessment was conducted during a visit to the site. The soil profile was inspected to a depth of approximately 50cm in order to assess for hydric signs such as grey matrix's and mottles/redoximorphic features.

4.13. Vegetation assessment

Vegetation is another useful indicator of wetland presence, hydrology, type and condition. For this reason, it is useful to use vegetation as one of the tools for delineating the wetlands on the study site as it identifies hydrophilic vegetation associated with frequently saturated soils. According to DWAF (2005), when using vegetation indicators for delineation, emphasis should be placed on the group of species that dominate the plant community, rather than on the individual indicator species. Table 12 and 13 present the wetland vegetation indicator and classification tools used to aid the delineation and assessment of the wetland.

The baseline characterization of the wetland and riparian flora was conducted by means of visual assessment surveys. The main focus of these investigations was to classify vegetation communities as a main surrogate for biodiversity patterns and to assist with the wetland delineation.

Table 12: Relationship between wetness zones and vegetation types (Adapted from DWAF, 2005:14)

Vegetation	Temporary	Seasonal	Permanent/ semi-permanent
If herbaceous	Predominantly grass species; mixture of species which occurs extensively in non-wetland areas, and hydrophilic plant species which are restricted largely to wetland areas	Hydrophilic sedge and grass species which as restricted to wetland areas	Dominated by 1. Emergent plants including reeds (*Phragmite australis*), mixture of sedges and bulrushes (*Typha capensis),* usually 2. Floating or submerged aquatic plants.
If woody	Mixture of woody species which occur extensively in non-wetland area, and hydrophilic plant species which are restricted largely to wetland areas	Hydrophilic woody species, which are restricted to wetland areas	Hydrophilic woody species, which are restricted to wetland areas. Morphological adaptations to prolonged wetness (e.g. prop roots)

Table 13: Classification of plants according to occurrence in wetland (Adapted from Reed, 1998 cf DWAF, 2005:14)

Obligate wetland (ow) species	Almost always grow in wetlands (> 99% of occurrences)
Facultative wetland (fw) species	Usually grow in wetlands (67-99%) but occasionally are found in non-wetland areas
Facultative (f) species	Are equally likely to grow in wetlands and non-wetlands areas (34-66% of occurrences)
Facultative dry-land (ld) species	Usually grow in non-wetland areas but sometimes grow in wetlands (1-34 % of occurrences)

Kotze and Marneweck (1999) have developed a method for utilising vegetation as an indicator of wetland conditions. They note that more than 50% cover by fw[1]/ow[2] plants in either the wood of herbaceous layers is a clear sign of hydric

(wet soil) conditions. That if there are some fw/ow plants present but by less than 50% cover is a possible sign of hydric conditions and, that if no fw/ow plants are present then one can assume that there are no hydric conditions present.

4.14. Sensitivity Map

Following the site visit, an ecological sensitivity map of the site has been generated by integrating the information collected on-site with the available biodiversity information available in the literature and various spatial databases as described above. The ecological sensitivity of the different units identified in the mapping procedure was rated according to the following scale:

- **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 such as cropping. Most types of development can proceed within these areas with little ecological impact.

- **Medium** - Areas of natural or previously transformed land where the impacts are likely to be largely local and the risk of secondary impact such as erosion low. Development within these areas can proceed with relatively little ecological impact provided that appropriate mitigation measures are taken.

- **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 within these areas is highly undesirable and should only proceed with caution as it may not be possible to mitigate all impacts appropriately.

- **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.

4.15. Methodology Adapted in Assessing the Impacts

The significance of the impacts will be assessed considering the following descriptors:

Table 14: 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*).
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 by 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 in spite of 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

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 15 below.

Table 15: 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 definitely 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.

5. RESULTS FOR TERRESTRIAL ASSESSMENT

5.1. Floral diversity

5.2. Overview

The vegetation of the study area, as visited on the 18th November 2024, was mostly in a growing state. Succulents, shrubs and trees still had enough green foliage and/or were in flower and could be identified with ease. Most of the grasses could still be identified where in seed, but most forbs and geophytes were already absent or in an advanced state of grow-back, enabling only the identification to genus level, where still visible. Overall, the vegetation was showing signs of long-term over-utilisation: although the grass layer was very dense, it was dominated by less palatable increaser grasses. Erosion was limited to prominent adjacent to and along small streams – especially on the Thukela river forming the north and eastern border of the study area.

A total of 142 plant species were recorded during the course of the survey, of which 117 were indigenous species – the remaining 15 species were exotic species, including NEMBA-listed alien invasive species. This is opposed to the potentially over 400 species that have been historically recorded in the surrounding Thukela Valley Bushveld and the Thukela Thornveld. Three broad vegetation units could be defined:

- ***Thukela Valley Bushveld***: The larger part of the study area consisted of a variable low thicket, dominated by microphyllous shrubs. Occasional 'bushclumps' with primarily broad-leaved woody species were scattered throughout. The Thukela valley bushveld vegetation could be roughly divided into two subtypes, namely:
    - Plains Thukela bushveld on undulating plains, with a typically very dense grass layer.

- Rocky Thukela bushveld on elevated areas, characterised by shallow soils and/or a high amount of surface rockiness, with a more prominent shrub and succulent layer, but a highly variable to sparse grass layer.

- ***Riparian Veld***: Vegetation in the water, on the banks as well as adjacent areas, which included depressions leading to the streams and erosion banks, was equally variable, being dominated either by a cyperoid layer or a mixture of shrubs and herbs. The composition and abundance of species present in this vegetation unit could change significantly depending on the volumes and timing of water in the streams and dams, as well as possible flooding events. As the dynamics of this vegetation is dependent and strongly driven by seasonal flows, and ecosystem functionality is the same, it was all grouped into one habitat type. It must be noted that Riparian Mixed Veld naturally extends beyond the soil-based riparian zone delineation.
- The ***cultivated and settlement areas*** contain more of the invaders as the primary vegetation has been removed

The different vegetation units are described in more detail below. The full species list for each vegetation unit as recorded is provided in Appendix A.

5.3. Thukela Valley Bushveld

The vegetation structure on the larger extent of the study area consisted of a patchy cover of low trees (generally 0.5-2 % cover) and tall to high shrubs (with 5 – 25% cover), resembling low shrubland (Edwards, 1983) with a variably dense grass layer. The high shrub *Vachellia natalitia, Vachellia tortilis, Vachellia nilotica, Vachellia sieberiana* and the grass *Cymbopogon excavates, Melinis repens, Panicum maximum and Themeda triandra* were the most dominant species.

- **Plains Thukela bushveld**

On the lower undulating plains adjacent to and between the two streams, the 'Plains Thukela Thornveld' consisted of a more open shrub and tree layer, rarely exceeding 3.5 m, with an occasional tall tree or bushclumps, and a dense high grass layer. The bushclumps were dominated by *Searsia* and *Gymnosporia* species, overgrown with *Clematis brachiata,* and with *Asparagus* species generally present in the undergrowth. Asparagus *Gladiolus* species was found to be rather abundant, but due to its state of die-back could not be further identified beyond genus level.

Other species included *Gymnosporia buxifolia, Hippobromus pauciflorus, Searsia dentata, Vachellia natalitia, Coddia rudis, Dichrostachys cinerea, Asparagus virgatus, Pupalia lappacea, Berkheya echinacea, Rhynchosia minima, Hypoestes aristata, Peristrophe cernua, Stapelia leendertziae, Vachellia natalitia, Vachellia tortilis, Vachellia nilotica,*

Vachellia sieberiana whereas the grass species included *Aristida congesta, Chloris virgata, Cymbopogon excavatus, Cynodon dactylon, Eragrostis chloromelas, Eragrostis cilianensis, Hyparrhenia hirta, Melinis repens, Panicum maximum.*

Figure 9: Overview of the plains Thukela Bushveld in the study area

Figure 10: Some dense wood area with Vachellia species

- **Rocky Thukela Bushveld**

On the higher ridges, outcrops and upper plains, surface rockiness was much higher, providing a higher niche diversity. In general, tree- and shrub density was higher, as well as the general height of the woody layer (Figure 10). Larger patches of Protected *Aloe* species were common, and the undergrowth of bushclumps between boulder rocks was characterised by dwarf shrubs of *Coddia rudis* and *Grewia hispida*. It is assumed that the height of the latter two species remained stunted due to continuous browsing by goats. A much higher diversity of dwarf shrubs and forbs was expected in this 'Outcrop Thukela Thornveld', but these were most likely already dormant, as were several geophytic species, of which only dried-up remains could be observed.

The High shrubs and trees in the vegetation unit include *Diospyros lycioides, Euclea crispa s. crispa, Searsia dentata, Searsia rehmanniana, Senegalia caffra, Vachellia natalitia.* Other species include *Aloe maculata, Aloe marlothii, Aloe mudenensis, Aloe rupestris, Euphorbia clavarioides, Asparagus cooperi, Euphorbia grandidens, Euphorbia tirucalli, Euphobia ingens, Asparagus divaricatus, Coddia rudis, Grewia hispida, Crinum species, Hypoxis species.* The grass species consist of *Aristida congesta, Cymbopogon excavatus, Eragrostis chloromelas, Hyparrhenia hirta, Melinis nerviglumis*

Figure 11: Typical views of Rocky Thukela Bushveld in the study area

Riparian Vegetation

The study area slopes in a south-easterly direction, and is traversed by many non-perennial streams which flows to the Thugela River. Along these streams are various incisions and eroded banks, in and from which runoff collects and

flows or seeps into the streams. Such areas are typically dominated by Cyperoid species or the grass Imperata cylindrica, or on occasion with a denser layer of high shrubs or low trees, mostly Searsia species and Vachellia karroo. In addition to the streams, there are two small anthropogenic dams, of which surface water levels could diminish significantly or even evaporate entirely during the dry season.

The composition and abundance of species present in this vegetation unit could change significantly, depending on the volumes and timing of water present in the streams and dams, as well as possible flooding events. As the dynamics of this vegetation is dependent and strongly driven by seasonal flows, and ecosystem functionality is the same, it was all grouped into one vegetation unit. It must be noted that Riparian Mixed Veld naturally extends beyond the soil-based riparian zone delineation.

Woody shrubs and trees included *Ehretia rigida, Gymnosporia senegalensis, Searsia pentheri, Vachellia karroo, and Asparagus cooperi*. Grasses recorded are *Chloris virgata, Eragrostis planiculmis, Imperata cylindrica, Typha capensis,* Cyperus species, Ranunculus multifidus

Figure 12: Examples of Riparian vegetation in the study area

5.4. Cultivated and settlement areas

The ***cultivated and settlement areas*** contain more of the invaders as the primary vegetation has been removed. These plant species include, *Agave sisalana, Datura ferox, Eucalyptus sp., Jacaranda mimosfolia, Melia azedarach, Solanum linnaeanum, Solanum seaforthianum, Verbena bonariensis, Xanthium strumarium, Tagetes minuta, Bidens pilosa, Amaranthus hybridus and Rubus rigidus*. Some of the natural grasses include *Andropogon appendiculatus, Brachiaria serrata, Cynodon dactylon, Digitaria monodactyla, Digitaria tricholaenoides, Eragrostis curvula and Eragrostis gummiflua,* with *Acacia sieberiena* sparsely distributed on the vegetation unit.

5.5. 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. Therefore, it is important that all these transformers be eradicated and controlled by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species (Henderson, 2001).

According to the published Alien and Invasive Species regulations in terms of section 97(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) four categories of problem plants are identified as:

- **Category 1a** plants are high-priority emerging species requiring compulsory control. All breeding, growing, moving and selling are banned.
- **Category 1b** plants are widespread invasive species controlled by a management programme.
- **Category 2** plants are invasive species controlled by area. Can be grown under permit conditions in demarcated areas. All breeding, growing, moving, and selling are banned without a permit.
- **Category 3** plants are ornamental and other species that are permitted on a property but may no longer be planted or sold.

Few alien plant species were recorded in the study area at the time of the survey. Table 2 lists the alien species as well as the various NEMBA categories for the alien species recorded during the survey.

Table 16: Alien species recorded in the study area

Scientific name	Common name	NEMBA Category
Acacia mearnsii	Black wattle	2
Agave sisalana	Sisal	1b
Datura ferox	Large apple thorn	b
Eucalyptus camaldulensis	River Red Gum	1b
Grevillea robusta	Australian Silky Oak	3
Lantana camara	Bird's brandy; cherry pie; tick-berry	1b
Malvastrum coromandelianum	Prickly Malvastrum	1b
Melia azedarach	Syringa	1b
Opuntia Ficus-indica	Prickly pear	1b
Pennisetum setaceum	Fountain Grass	1b
Pinus pinaster	Cluster pine	2

Populus alba	Grey poplar, Matchwood poplar	2
Solanum linnaeanum	Apple of Sodom	1b
Solanum mariantanum	Bug weed	1b
Solanum seaforthianum	Potato creeper	1b
Tithonia diversifolia	Mexican Sunflower	1b
Verbena brasiliensis	Brazilian Verbena	1b
Xanthium strumarium	Rough cocklebur	1b
Zinnia peruviana	Red Zinnia	expected to be listed

Figure 13: Opuntia ficus-indica

5.6. Medicinal Plants

The demand for medicinal plants is increasing while the frequently used species and the communal land that it is harvested from are on the decline. With an increase in the country's population and the high rate of infectious diseases, this will put an even higher strain on the already scarce natural medicinal resources (Emery *et al*., 2002). Areas of high

biodiversity are thus important for the conservation and sustainable use of these resources and should be protected. Most of the medicinal plant species recorded in the study area was alien species.

Table 17: Medicinal plants recorded in the study areas.

Scientific name	Common name	Conservation Status
Lantana camara	Common lantana	Exotic
Lippia javanica	Lemon bush	Indigenous
Ziziphus mucronata	Buffalo thorn	Indigenous
Aloe marlothii	Mountain aloe	Indigenous
Aloe maculata	Soap aloe	Indigenous
Aloe ecklonis	Grass Aloe	Indigenous
Hypoxis colchicifolia	Broad-leaved hypoxis	Indigenous
Hypoxis costata	Small Yellow Star	Indigenous

5.7. Description of the CBAs

Critical Biodiversity Areas (CBA's) are terrestrial and aquatic features in the landscape that are critical for 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 sectors inputs into multi-sectoral planning and decision making tools.

The primary purpose of CBA's is to inform land-use planning and the land-use guidelines attached to CBA's aim to promote sustainable development by avoiding loss or degradation of important natural habitat and landscapes in these areas and the landscape as a whole. CBA's can also be used to inform protected area expansion and development plans. The use of CBA's here follows the definition laid out in the guideline for publishing bioregional plans (Anon, 2008):

- "**Critical biodiversity areas** (CBAs) are areas of the landscape that need to be maintained in a natural or near-natural state in order 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".
- "**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 18: 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.

CBA category	Land Management Objective
PA & CBA 1	**Natural landscapes**: • Ecosystems and species fully intact and undisturbed • These are areas with high irreplaceability or low flexibility in terms of meeting biodiversity pattern targets. If the biodiversity features targeted in these areas are lost, then targets will not be met. • These are landscapes that are at or past their limits of acceptable change.
CBA 2	**Near-natural landscapes**: • Ecosystems and species largely intact and undisturbed. • 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 our ability to achieve targets.

CBA category	Land Management Objective
	• These are landscapes that are approaching but have not passed their limits of acceptable change.
Ecological Support Areas (ESA)	**Functional landscapes**: • Ecosystems moderately to significantly disturbed but still able to maintain basic functionality. • Individual species or other biodiversity indicators may be severely disturbed or reduced. • These are areas with low irreplaceability with respect to biodiversity pattern targets only.
Other Natural Areas (ONA) and Transformed	**Production landscapes**: manage land to optimize sustainable utilization of natural resources.

According to the latest KZN biodiversity sector plan (2014), the majority of the remaining natural vegetation is regarded as CBA Optimal and ESA. CBA Optimal are areas that are the most optimal to meet the biodiversity conservation targets while avoiding high cost areas as much as possible. A small portion of the surface mining area is located uncategorised area. There is a correlation between the CBA map as well as the Mining Guideline and Biodiversity Map.

As it can be seen on figure below, bigger portion of the site is regarded as CBA-optimal, however the bigger portion of the site has been ranked as a highest biodiversity area prone to mining, which requires that the specialist studies should focus on confirming the presence and significance of these biodiversity features, and to provide site-specific basis on which to apply the mitigation hierarchy to inform regulatory decision-making for mining, water use licenses, and environmental authorisations. If they are confirmed, the likelihood of a fatal flaw for new mining projects is moderate because of the significance of the biodiversity features in these areas and the associated ecosystem services

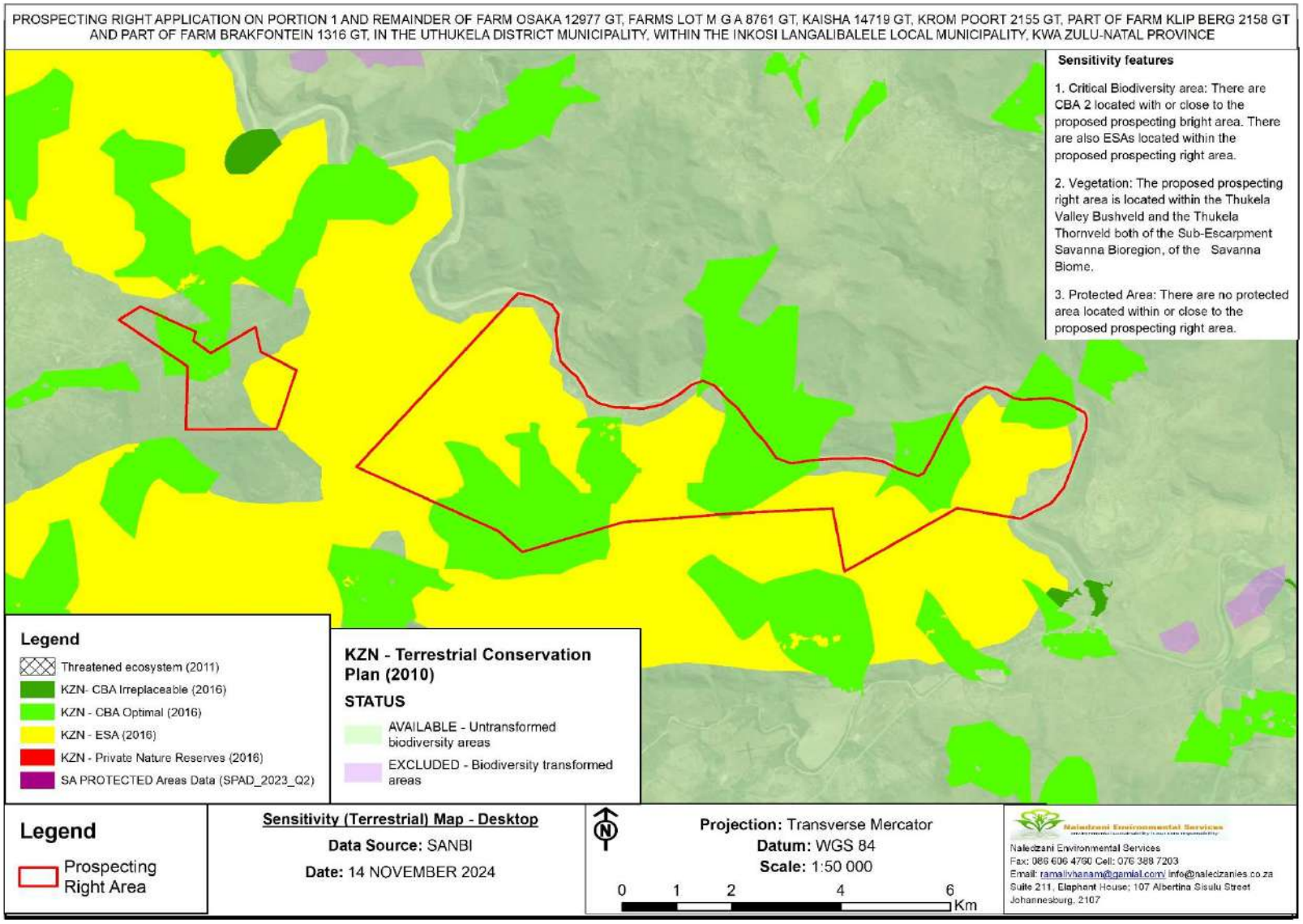


Figure 14: CBA map of the site

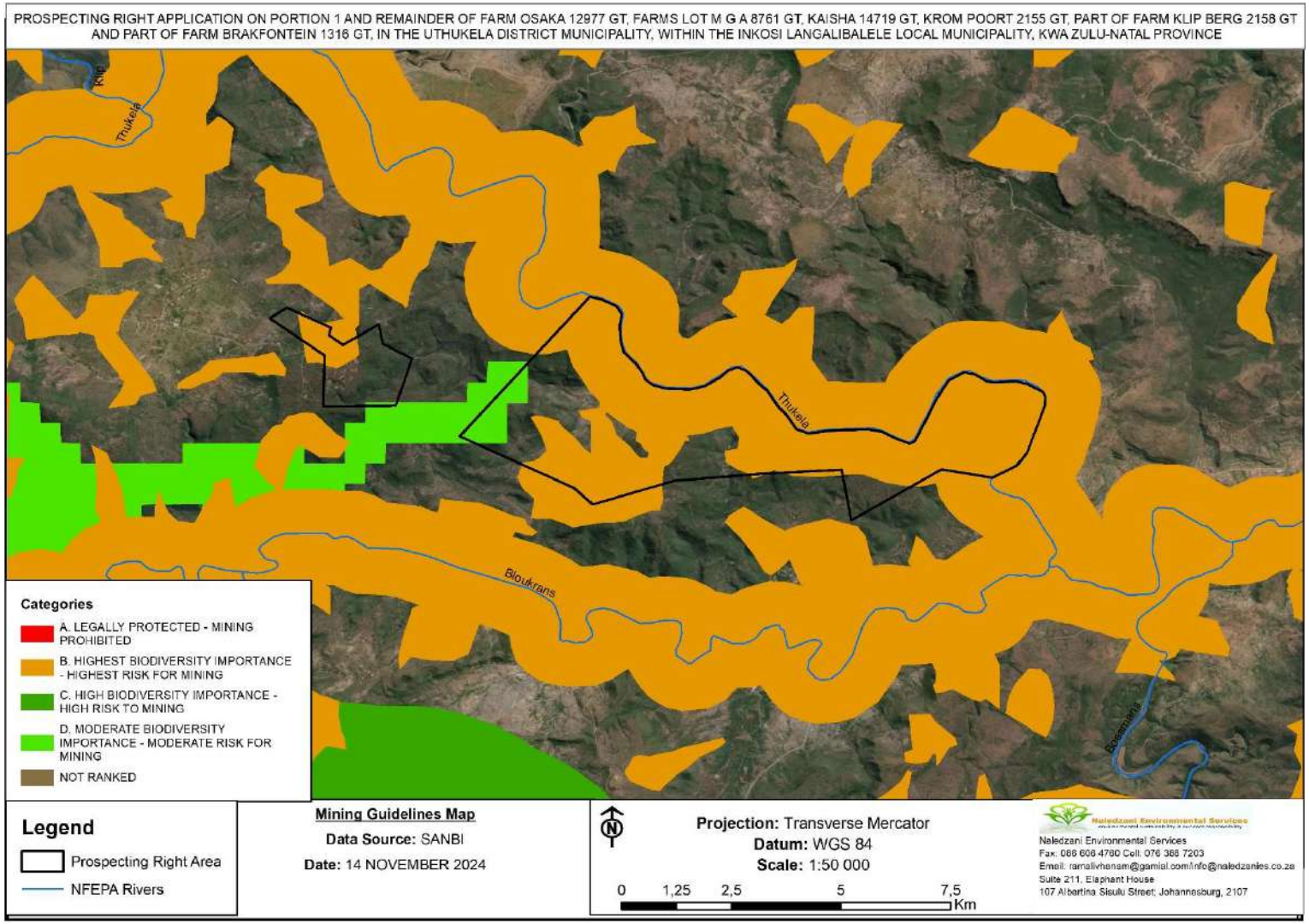


Figure 15: Mining guideline map

5.8. Avi-fauna

The total of 229 avian species have previously been recorded within the quarter grid cell based on the South African Bird Atlas Project 2. During assessment few birds were noted on site and this may be due to:

- The time of year at which the survey was undertaken – during the dry season many summer residents migrate north and only common residents would be observed; and
- Egg collecting by adjacent land users may reduce the abundance and diversity of resident bird species.

It is widely accepted that vegetation structure, rather than the actual plant species, influences bird species' distribution and abundance (Harrison *etal.*, 1997). Therefore, the vegetation description used in the Bird Atlas does not focus on lists of plant species, but rather on factors which are relevant to bird distribution. A list of birds on the QDGC is attached as appendix B.

5.9. Mammals

According to distribution maps (IUCN, 2019) approximately 87 mammal species have distributions which overlap with the larger project area1. This is comprised of insectivores, chiropterans, primates, lagomorphs, Eulipotypha, rodents, carnivores and ungulates.

According to MammalMap (Animal Demographic Unit) a total of 23 species have been recorded within the dequarter degree square (QDS). However, it must be noted that approximately 35% of these species are largely restricted to nature reserves/privately owned conservation areas. These include megafauna such as Elephant (*Loxodonta africana*), Lion (Panthera leo), Cheetah (*Acinonyx jubatus*) and Hippopotamus (Hippopotamus amphibius). The remaining species diversity is low and is likely attributed to a lack of sampling effort coupled with anthropogenic habitat modification and associated pressures within the QDS.

Terrestrial and arboreal habitats were the dominant niches from a spatial perspective associated with the project area. The project area represents a relatively large tract of remaining habitat within the Ladysmith urban landscape. Therefore, although not pristine the area provides refuge as well as some degree of connectivity to surrounding micro-habitats characterised by unique ecological features including unique floral assemblages and specific micro-climate conditions. As such these habitats provide elevated niche heterogeneity and subsequent higher species richness than adjacent anthropogenically modified areas.

During the November 2024 site investigation, five mammals were identified within the project area based on direct and indirect signs. These were dominated by small-medium-sized species with a tolerance to anthropogenically modified landscapes.

Table 19: Mammals identified during the field survey

Family	Scientific Name	Common Name	Conservation Status	Habitat
Bovidae	*Sylvicapra grimmia*	Common Duiker	LC	Outcrop and plains Thukela bushveld
Herpestidae	*Herpestes sanguineus*	Slender Mongoose	LC	Rocky Thukela bushveld
Procaviidae	*Procavia capensis*	Rock Hyrax	LC	Rocky Thukela bushveld
Felidae	*Caracal caracal*	Caracal	LC	Riparian Vegetation
Leporidae	*Lepus saxatilis*	Scrub Hare	LC	Ropcky and plains Thukela bushveld

5.10. Amphibians

According to Minter et al. (2004), 19 amphibian species have been confirmed to occur within the affected QDGC. Based on habitat availability within the present study area, especially many perennial and non-perennial watercourses, many of the frog species confirmed to be present within QDGC's are likely to be present within the study areas. These species include *Afrana angolensis, Afrana fuscigula, Afrana angolensis, Breviceps adspersus, Bufo gutturalis, Bufo rangeri, Cacosternum boettgeri, Cacosternum nanum, Hemisus guttatus, Hyperolius marmoratus, Kassina senegalensis, Phrynobatrachus natalensis, Schismaderma carens, Strongylopus fasciatus, Tomopterna natalensis, Tomopterna cryptotis, Tomopterna natalensis, Tomopterna tandyi and Xenopus laevis.*

6. RESULTS FOR THE WETLAND FEATURES

6.1. Delineated Wetlands

The South African classification system categorises wetland systems based on the characteristics of different Hydrogeomorphic (HGM) Units. An HGM unit is a recognisable physiographic wetland-unit based on the geomorphic setting, water source of the wetland and the water flow patterns (Macfarlane et al., 2008). There are five broad recognised wetland systems based on the abovementioned system and these are depicted in Figure 17. The classification of these wetlands is then further refined as per the 'Classification System for Wetlands and other Aquatic Ecosystems in South Africa' (Ollis et al., 2013).

Two types of natural wetlands were recorded on the boundaries of the site, within the boundaries of the study areas. These are **Seep** as well as **Flood-plain** wetlands.

- The Seep wetland feeds the water resources in the valley and is characterised by shallow sub-surface flows. Seeps occur in cases where these flows seep out and form wetland conditions within the first 50cm.
- The second wetland type on site is the **floodplain** wetland. This wetland occurs along the Orange River and borders the site. Floodplain wetland—a wetland area on the mostly flat or gently-sloping land adjacent and formed by an alluvial river channel, under its present climate and sediment load, which is subject to periodic inundation by overtopping of the channel bank.

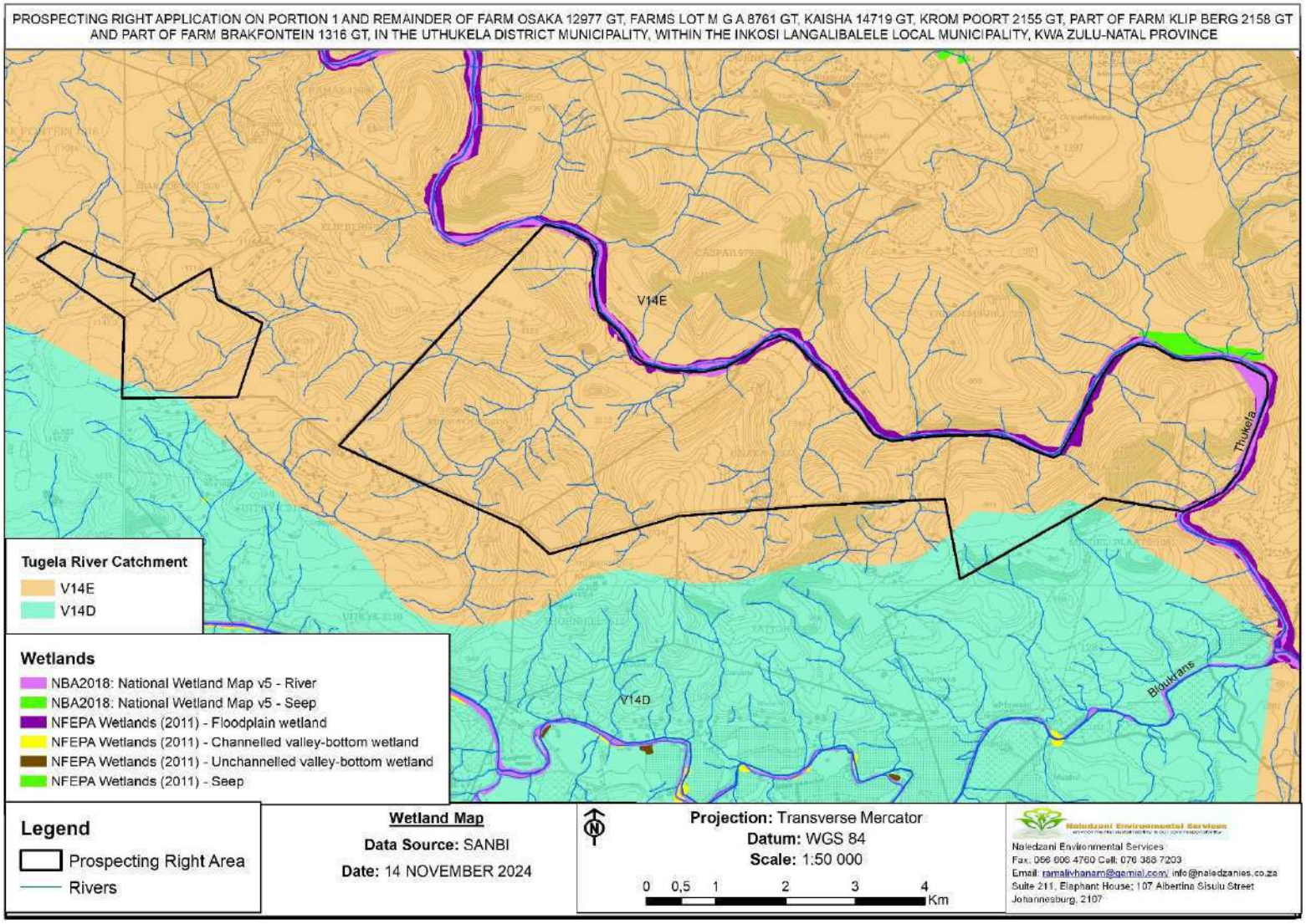


Figure 16: Wetland map of the site

6.2. PES of wetlands in the study area

The wetland on site was assessed and it was allocated the PESC of B and D - being largely natural with some habitat modification. The Present ecological state (PES) of the wetland on site is calculated as per the table below

Table 20: Broad PES values and categories of the wetland in the study area

Wetland type	Mean PES value	PESC
Flood plain	3.6	B
Seep	3.7	B

6.3. EIS of wetlands in the study area

The wetland in the study area has EIS categories and EMC values as indicated in Table 21

Table 21: EIS and EMC values of wetlands in the study area.

Wetland	EIS Category (Median value)	EMC
Flood-plain	Moderate (Median value 1.4)	C
Seep	Low (Median value 1.4)	C

6.4. Vegetation

The vegetation of the flood-plain wetland along the river was found to be characterised by both permanent wetland plants as well as non-wetland plants (more along the edges of the river). There was no wetland plants/either seasonal or permanent on the pans. This might have been due to the fact that these pans have not had water for year (See figure 18).

6.5. Buffer allocation

The National Environmental Management Act (Act 107 of 1998) stipulates that no activity can take place within 32m of a wetland without the relevant authorisation. In addition, the National Water Act (Act 36 of 1998) states that no diversion,

alteration of bed and banks or impeding of flow in watercourses (which includes wetlands) may occur without obtaining a Water Use Licence authorising the proponent to do so. This prescribed 32m buffer zone is deemed sufficient to maintain and improve the PES and limit any further impact of the proposed development on the local wetland resources.

The riparian zone/wetland areas and their associated buffer areas are presented in the figures to follow. Any activities occurring within the riparian zone/wetland areas or within a 32m buffer of the riparian zone/wetland areas must be authorised by the DWS in terms of Section 21 (c) & (i) of the NWA (Act 36 of 1998).

In this assessment the buffer allocation is as follows:

- And 100 meters' buffer for the flood-plain

The allocation of buffers was in accordance with the wetlands PES as well as EIS. The allocated buffers can be reviewed subject to recommendations from the Department of Water & Sanitation (Map attached as ***Appendix C***).

7. ASSESSMENT OF IMPACTS

7.1. Introduction

The Regulations in terms of Chapter 5 of the National Environmental Management, Act No. 107 of 1998 requires that a description must be given of the potential impacts the proposed development will have on the environment. Table 22 below presents details of the identified impacts for the different proposed project activities and their proposed mitigation measures.

Table 22: Environmental Impacts for the proposed project assessed by combining the consequences (extent, duration, intensity) with the probability of occurrence before and after mitigation for the proposed project

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**
Vegetation Clearing for the prospecting purpose	Destruction of protected plant species	Prospecting	Negative	Low (4)	Site only (1)	Long term (4)	Definite (5)	Medium (45)	• Supervision by an ecologist to ensure success of the rescue operation • Place drilling holes and trenching pits away from any red listed and/or protected plant species • Use already available farm roads to avoid trampling red listed plant species	Low
	Removal of the natural vegetation	Prospecting	Negative	Moderate (6)	Site only (1)	Long term (4)	Definite (5)	Medium (55)	• Due to the sensitivity of the areas it is advised that areas designated for vegetation clearing should be identified and visibly marked off and also approved as part of final drilling map • Vegetation clearing areas should be kept to a minimum and restricted to the proposed drilling sites. • Exposed areas should be rehabilitated with indigenous plants to the project area as soon as construction is finished.	Low
	Disturbance to animals on site	Prospecting	Negative	Moderate (6)	Local (2)	Short term (3)	High (4)	Medium (44)	• Do not disturb nests, breeding sites or young ones. Do not attempt to kill or capture snakes unless directly threatening the safety of employees. • Dogs or other pets are not allowed to the worksite as they are threats to the natural wild animal • A low speed limit should be enforced on site to reduce wild animal-vehicle collisions • No animals should be intentionally killed or destroyed and poaching and hunting should not be permitted on the site. • Severe contractual fines must be imposed and immediate dismissal on any contract employee who is found attempting to snare or otherwise harms remaining faunal species. • Hunting weapons are prohibited on site. • Contract employees must be educated about the value of wild animals and the importance of their conservation.	Low

									• The ECO must conduct regular site inspections of removing any snares or traps that have been erected. • Employees and contractors should be made aware of the presence of, and rules regarding, flora and fauna through suitable induction training and on-site signage. • Ensure that the colours used to paint the buildings including the roof are blending to the environment	
	Increased soil erosion, increase in silt loads and sedimentation	Prospecting	Negative	Low (4)	Local (2)	Long term (4)	Definite (5)	Medium (50)	• Following prospecting, rehabilitation of disturbed areas is required • Avoid areas with sensitive soils, steep slopes during rain or windy season. • Ensure that roads are not paved but well maintained (as gravel) to reduce the speed of water by promoting infiltration.	Low
	Establishment and spread of declared weeds	Prospecting	Negative	Moderate (6)	Site (1)	Long term (4)	Definite (5)	Medium (55)	• The best mitigation measure for alien and invasive species is the early detection and eradication of these species which will be ensured with the use of a monitoring programme. • An alien invasive management programme should be developed and implemented in order to control alien invasive species	Low
Waste generation	Pollution due to oil and fuel spills, erosion, and ablution facilities.	Prospecting	Negative	Moderate (6)	Local (2)	Long term (4)	Definite (5)	High (60)	• Proper ablution facilities on site must be provided. • Constant rehabilitation of erosion problems. • Proper storage facilities of construction materials. • Waste management is very important. Proper storage and removal strategy must be in place. • Proper Standard Operating Procedures in place regulating refuelling and other potential polluting activities. • Must have rehabilitation strategy as part of EMP such as a clean-up plan/strategy if spills occur and proper facilities (ablution) to ensure no sewerage spills into drainage lines and streams.	Low

Wetland destruction	Prospecting on wetlands/along wetlands	Prospecting	Negative	High (8)	Local (2)	Long term (4)	Definite (5)	High (70)	• Prospecting across wetlands/rivers should not take place unless authorise by WUL. • Ensure that prospecting activities are carefully monitored to limit unnecessary impacts to wetlands/riparian areas (particularly in-stream habitat) and should be approved by WUL. • Do not lower the original stream bed / profile of the wetland/river as this may result in scouring in an upstream direction and further alteration of bed conditions. • Ensure that coarse immovable material including boulders and other rock in river channels is not removed to ensure continued stability and functioning of the river systems. River sediments should not be permanently removed from the system in any case.	Low

8. CONCLUSION AND RECOMMENDATIONS

The study area is part of the original Thukela Thornveld and the Thukela Valley Bushveld within the Sub-Escarpment Savanna Bioregion. The vegetation of the study area, as visited in November 2024, was mostly in a growing state, but could be roughly divided into three habitat types. Overall, the vegetation was showing signs of long-term over-utilisation: although the grass layer was very dense, it was dominated by less palatable increaser grasses. Only 142 plant species could be recorded during the course of the survey, of which 117 were indigenous species – the remaining 15 species were exotic species, including NEMBA-listed alien invasive species. Is it expected that the total number of species within the study area is higher, but many of the potential species will only be visible during the growing season.

From a biodiversity perspective, the proposed development will lead to a localised change and/or loss of natural habitat and numbers of species of conservation concern and a localised reduction of indigenous species diversity. Consequently, from an ecological perspective, the area may no longer qualify as 'optimal' for the conservation of species. Once the development has been built this area will loose its qualification as CBA Optimal entirely due to fragmentation and the edge effect. However, this reduction and fragmentation of natural habitats, should, if mitigation measures as recommended are implemented, not result in a change of conservation status of vegetation or of any species of conservation concern present on or occasionally visiting the area. The most important will be that a pre-construction walk-through is conducted to determine the true number and area of occurrence of Protected and potentially Threatened plant species within the study area. This survey should ideally be conducted between the months of December and March, which should represent the peak growing season. This will enable an appropriate search- and rescue operation to limit the destruction of plant species of conservation concern.

From wetland perspective, based on the current identification approach of the four wetland indicators, no wetland systems were identified or delineated within the study area but 2 bordering the site.

It is therefore important that the placement of the prospecting sites including structures is done with these sensitive areas in mind. The placement of drilling sites must take into account the area contains protected and red listed plants. The opportunity exists however, for the proposed prospecting to contribute significantly to conservation of biodiversity within the region, as not the whole area will be removed of vegetation but rather only the drilling sites. Conservation of as much of the natural land in the area within the site as possible, and the creation of corridors linking other natural areas would aid in conservation of ecosystems, flora and fauna. If efforts are made to initiate conservation of this habitat, and conservation is maintained after the closure of the prospecting, the net impacts on biodiversity will be positive.

It is then advised that prospecting may continue provided that the mitigation measures as suggested can be implemented, then the overall impact of the development components would be of low overall significance and it is unlikely that the development would result in an overall net loss of biodiversity or long-term degradation of the receiving environment.

9. REFERENCES

Brown, L.R., Du Preez, P.J., Bezuidenhout, H., Bredenkamp, G.J., Mostert, T.H.C., and Collins, N.B. 2013. Guidelines for phytosociological classifications and descriptions of vegetation in southern Africa. Koedoe 55(1), Art. #1103, 10pp

Department of Environmental Affairs and Tourism, 2007. National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004): Publication of lists of Critically Endangered, Endangered, Vulnerable and Protected Species. Government Gazette, Republic of South Africa.

Henderson, L. (2001). Alien Weeds and Invasive plants: A complete guide to declared weeds and invaders in South Africa. Agricultural Research Council, Pretoria.

Hilton-Taylor, C. (1996). Red Data List of Southern African Plants. Conservation Biology Research unit, National Botanical Institute, Pretoria.

http://invasives.org.za/

http://posa.sanbi.org/searchspp.php

http://sabap2.adu.org.za/

http://vmus.adu.org.za/

http://www.dwaf.gov.za/wfw/Control

Mucina L. & Rutherford M.C. (eds) 2012. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

Rutherford, M. C. and Westfall, R. H. (1994). Biomes of Southern Africa: an objective categorisation, Pretoria: National Botanical Institute.

APPENDIX A: PLANT SPECIES RECORDED WITHIN THE PROPOSED AREA

Agave decipiens

Agave sisalana

Ajuga ophrydis

Aloe maculata

Aloe marlothii

Aloe mudenensis

Aloe rupestris

Alternanthera pungens

Amaranthus hybridus

Anthospermum rigidum

Aristida congesta s. barbicollis

Aristida junciformis s. junciformis

Arundo donax

Asparagus cooperi

Asparagus densiflorus

Asparagus divaricatus

Asparagus virgatus

Berkheya echinacea

Bidens biternata

Bothriochloa bladhii

Bothriochloa insculpta

Caesalpinia decapetala

Canthium mundianum

Chloris gayana

Chloris virgata

Cirsium vulgare

Clematis brachiata

Coddia rudis

Combretum molle

Conyza sumatrensis

Corchorus asplenifolius

Cymbopogon excavatus

Cynodon dactylon

Cynodon nlemfuensis

Cyperus articulatus

Cyperus marginatus

Cyphostemma sp.

Datura stramonium

Digitaria eriantha

Diheteropogon amplectens

Diospyros lycioides

Ehretia rigida

Elionurus muticus

Eragrostis capensis

Eragrostis chloromelas

Eragrostis cilianensis

Eragrostis curvula

Eragrostis planiculmis

Eragrostis superba

Eucalyptus camaldulensis

Euclea crispa s. crispa

Euphorbia clavarioides

Felicia muricata

Fimbristylis dichotoma

Gazania krebsiana

Grevillea robusta

Grewia hispida

Gymnosporia buxifolia

Gymnosporia senegalensis

Gymnosporia sp.

Helinus integrifolius

Hermannia depressa

Hermannia grandistipula

Heteropogon contortus

Hippobromus pauciflorus

Hyparrhenia hirta

Hyparrhenia tamba

Imperata cylindrica

Jasminum sp.

Juncus oxycarpus

Ledebouria species

Maytenus acuminata

Melia azedarach

Melinis nerviglumis

Melinis repens s. repens

Nidorella anomala

Ocimum obovatum

Opuntia ficus-indica

Pappea capensis

Pennisetum setaceum

Pupalia lappacea

Ranunculus multifidus

Rhynchosia minima

Schkuhria pinnata

Searsia dentata

Searsia pentheri

Searsia rehmanniana

Senecio madagascariensis

Senecio sp.

Senegalia caffra

Senegalia schweinfurthii

Setaria sphacelata

Sida spinosa

Solanum mauritianum

Sonchus sp.

Sphedamnocarpus pruriens

Sporobolus pyramidalis

Stapelia leendertziae

Tagetes minuta

Tephrosia sp.

Themeda triandra

Thesium sp.

Tithonia diversifolia

Trifolium repens

Typha capensis

Vachellia karroo

Vachellia natalitia

Vachellia nilotica

Vachellia sieberiana v. woodii

Vangueria infausta

Verbena brasiliensis

Viscum rotundifolium

Xanthium strumarium

Zanthoxylum capense

Zinnia peruviana

Ziziphus mucronata

APPENDIX B: LIST OF BIRDS LIKELY TO INHABIT THE AFFECTED QDGC'S

Common species	Genus	Species
Southern Red	*Euplectes*	*orix*
Bokmakierie	*Telophorus*	*zeylonus*
Dark-capped	*Pycnonotus*	*tricolor*
Black-throated	*Crithagra*	*atrogularis*
Yellow-fronted	*Crithagra*	*mozambicus*
Anteating	*Myrmecocichla*	*formicivora*
Familiar	*Cercomela*	*familiaris*
Levaillant's	*Cisticola*	*tinniens*
Zitting	*Cisticola*	*juncidis*
South African	*Hirundo*	*spilodera*
Red-knobbed	*Fulica*	*cristata*

Common species	Genus	Species
Reed	*Phalacrocorax*	*africanus*
Cape	*Corvus*	*capensis*
Pied	*Corvus*	*albus*
Laughing	*Streptopelia*	*senegalensis*
Red-eyed	*Streptopelia*	*semitorquata*
Rock	*Columba*	*livia*
Yellow-billed	*Anas*	*undulata*
Cattle	*Bubulcus*	*ibis*
Amur	*Falco*	*amurensis*
Lanner	*Falco*	*biarmicus*
Common (Southern)	*Lanius*	*collaris*
Shelley's	*Scleroptila*	*shelleyi*

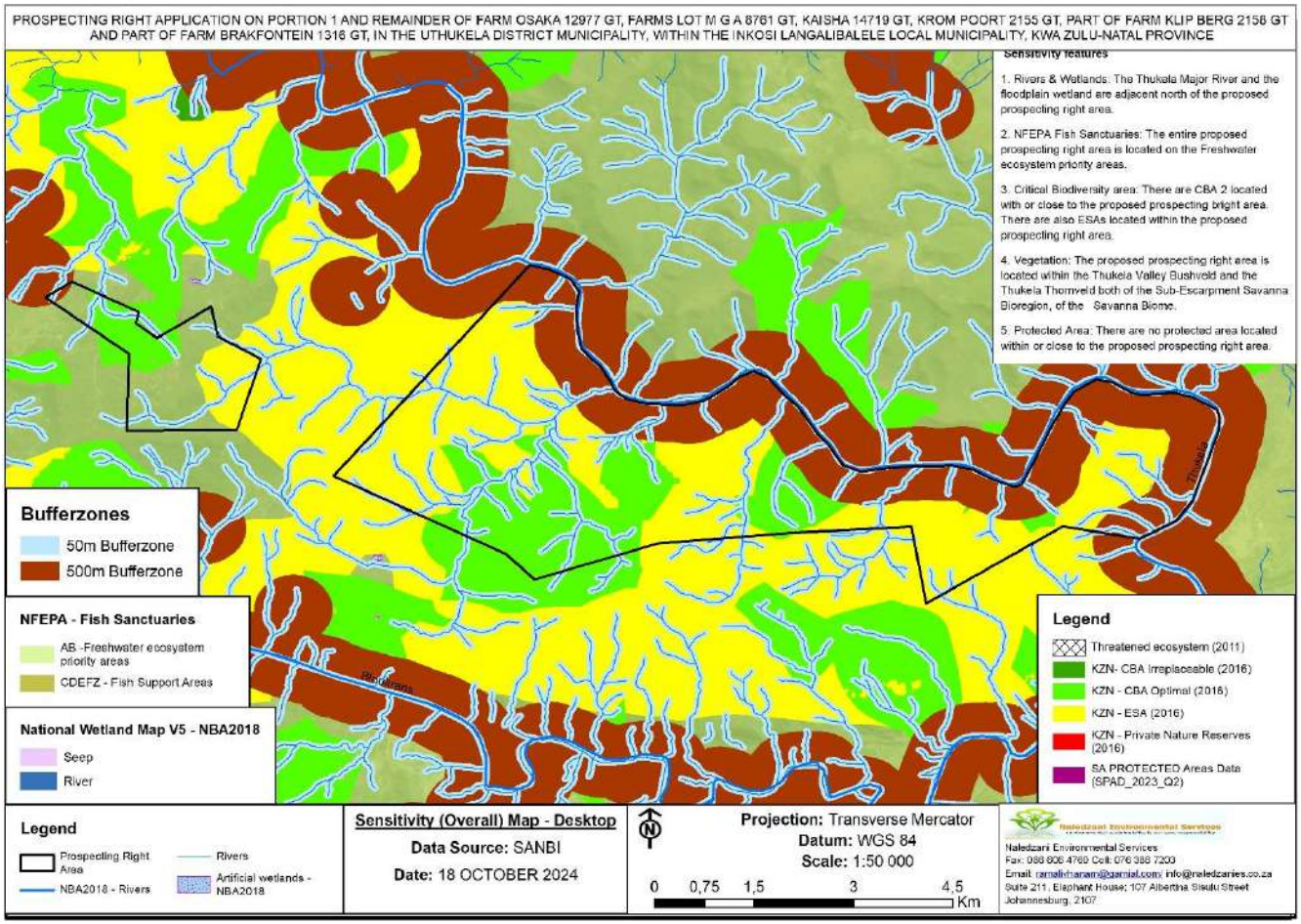
Common species	Genus	Species
Egyptian	*Alopochen*	*aegyptiacus*
Spur-winged	*Plectropterus*	*gambensis*
Little	*Tachybaptus*	*ruficollis*
Helmeted	*Numida*	*meleagris*
Hamerkop	*Scopus*	*umbretta*
Black-headed	*Ardea*	*melanocephala*
African	*Upupa*	*africana*
Common	*Delichon*	*urbicum*
African Sacred	*Threskiornis*	*aethiopicus*
Hadeda	*Bostrychia*	*hagedash*
Southern Bald	*Geronticus*	*calvus*
Black-shouldered	*Elanus*	*caeruleus*

Common species	Genus	Species
White-bellied	*Eupodotis*	*senegalensis*
Red-capped	*Calandrella*	*cinerea*
Rufous-naped	*Mirafra*	*africana*
Spike-heeled	*Chersomanes*	*albofasciata*
Cape	*Macronyx*	*capensis*
Banded	*Riparia*	*cincta*
Brown-throated	*Riparia*	*paludicola*
Southern	*Ploceus*	*velatus*
Common	*Gallinula*	*chloropus*
Common	*Acridotheres*	*tristis*
Neddicky	*Cisticola*	*fulvicapilla*
Black-headed	*Oriolus*	*larvatus*

Common species	Genus	Species
Speckled	*Columba*	*guinea*
African	*Anthus*	*cinnamomeus*
Three-banded	*Charadrius*	*tricollaris*
Red-billed	*Quelea*	*quelea*
Common	*Actitis*	*hypoleucos*
Streaky-headed	*Crithagra*	*gularis*
Cape	*Passer*	*melanurus*
House	*Passer*	*domesticus*
Swainson's	*Pternistis*	*swainsonii*
Pied	*Spreo*	*bicolor*
African	*Saxicola*	*torquatus*
Barn	*Hirundo*	*rustica*

Common species	Genus	Species
Greater Striped	*Hirundo*	*cucullata*
White-throated	*Hirundo*	*albigularis*
Cape	*Streptopelia*	*capicola*
Cape	*Motacilla*	*capensis*
Common	*Estrilda*	*astrild*
Orange-breasted	*Amandava*	*subflava*
Village	*Ploceus*	*cucullatus*
Pin-tailed	*Vidua*	*macroura*
Fan-tailed	*Euplectes*	*axillaris*
Long-tailed	*Euplectes*	*progne*
Red-collared	*Euplectes*	*ardens*

APPENDIX C: SENSITIVITY MAP TO BE ADHERED TO DURING PROSPECTING



PHASE I ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT SPECIALIST REPORT FOR THE PROPOSED COAL PROSPECTING RIGHT APPLICATION IN RESPECT OF FARM LOTMGA 8761 GT, FARM KAISHA 14719 GT, FARM OSAKA 12977 GT, FARM KROMPOORT 2155 GT AND FARM RAVINE 9201 GT IN THE ESTCOURT MAGISTERIAL DISTRICT, KWAZULU-NATAL PROVINCE

PREPARED BY

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OCTOBER 2024

ABILITY TO CONDUCT THE PROJECT

Alvord Nhundu is a professional archaeologist. He completed his Bachelor of Science with honours degree in archaeology with the University of the Witwatersrand (Wits) and Masters in Archaeology with the University of Pretoria (UP). His research interest lies in old and new world archaeology, palaeoenvironmental and climatology, archaeological theory, Later Stone Age, rock art, hunter-gatherers, hunter-gatherer interactions, several aspects of Southern African Iron Age and Indigenous archaeologies. Alvord is an accredited Cultural Resource Management (CRM) member of the Association of Southern African Professional Archaeologists (ASAPA No.338) with Field Director status in Iron Age and Stone Age, and Field Supervisor status in Grave Relocation and Rock Art. He is also affiliated to Society of South Africanist Archaeologists (SAfA) and the International Council of Archaeozoology (ICAZ). He has been practising CRM for more than 10 years and has completed over 100 Archaeological Impact Assessments (AIA) for developmental projects in the Limpopo, Mpumalanga, North-West, Eastern Cape, Free State, Northern Cape and KwaZulu Natal provinces of South Africa. The projects include establishment and upgrade of power substations, road construction, development of malls, housing developments, establishment and expansion of mines. He has also conducted the relocation of graves. His detailed CV is available on request.

INDEPENDENCE

I, Alvord Nhundu, declare that:

- I act as an independent specialist;
- I am conducting work relating to the proposed prospecting right application in an objective manner, even if this results in views and findings that are not favourable to the client;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have the required experience in conducting the specialist report and I will comply with legislation, regulations and any guidelines that have relevance to the proposed activity;
- I have not, and will not engage in conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the details and particulars furnished by me in this declaration are true and correct;
- I will perform all other obligations as expected from a heritage practitioner in terms of the Act and the constitutions of my affiliated professional bodies; and
- I realise that a false declaration is an offence in terms of regulation 71 of the regulations and is punishable in terms of section 24F of the NEMA.

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ACKNOWLEDGMENTS

The author would like to acknowledge Vahlengwe Mining Advisory and Consulting staff for their assistance in conducting the project. Google Earth and Wikipedia are also acknowledged.

EXECUTIVE SUMMARY

Introduction

Ruins Archaeo-Heritage Consulting (Pty) Ltd was appointed by Vahlengwe Mining Advisory and Consulting (Pty) Ltd on behalf of Saqondisana Investments (Pty) Ltd to conduct an Archaeological and Cultural Heritage Impact Assessment study for the proposed coal prospecting right application on the Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT and Farm Ravine 9201 GT in the Magisterial District of Estcourt, KwaZulu-Natal Province. As prescribed by SAHRA and stipulated by the legislation, an HIA is a pre-requisite for such a development. The main purpose of the study was to identify and document the archaeological sites, cultural resources, sites associated with oral histories, graves, cultural landscapes, and any structure of historical significance that may be affected by the proposed development. To reach a defensible recommendation, both a desktop study and a field survey were conducted. The desktop study was undertaken through the South African Heritage Resources Information System (SAHRIS) for previous Archaeological Impact Assessments conducted in the region of the proposed development, and also for research that has been carried out in the wider area over recent years. The field survey was conducted to validate any assumptions made during the desktop study. This Heritage Impact Assessment was undertaken in terms of Section 38 (8) of the National Heritage Resources Act (Act No. 25 of 1999).

Methods

To understand the archaeology of the area, a background study was undertaken, and relevant institutions were consulted. These studies entail the views of archaeological and heritage impact assessment studies that have been conducted in and around the proposed area through SAHRIS. The author conducted the field survey on the **10th of October 2024.** The area of land for the proposed development was investigated by vehicle and on foot for any traces of material culture.

Restrictions and constraints

The site is disturbed by previous and current land use activities. The portion of the farm is within an active game farming and safari landscape in a mountainous terrain. Some sections of the farm could not be accessible due to the terrain. As with any survey, archaeological materials may be under the surface and therefore unidentifiable to the surveyor until they are exposed once prospecting begins. As a result, should any previously unidentified archaeological/ or grave site be observed during the prospecting stage, a heritage specialist monitoring the development must immediately be notified.

Results

The Phase I Cultural-Heritage Impact Assessment study for the proposed prospecting right application noted that the study area is within a heavily disturbed landscape. The area has been heavily disturbed by

human and game farming activities. The survey noted that some stone tools and potsherds exist within the study area. The study noted that burial sites exist in the study area and within homesteads, detailed photographic recording could not be conducted without custodian's permission, therefore the study does trigger Section 36 of the NHRA read together with Section 38 of the KwaZulu-Natal Amafa and Research Institute Act No. 05 of 2018 and the identified burial sites warranty protection from prospecting activities. The study also triggers Section 37 of the KwaZulu-Natal Amafa and Research Institute Act No. 05 of 2018 as old buildings and structures do exist within the study area, however, none will be affected as no prospecting activities are to be done within 100 meters of the existing buildings and structures. It is important to note that although the site is heavily disturbed as evidenced by the clearing and farmlands, the possibility of chance finds is ever present and during the prospecting phase the developer is urged to be careful and heedful of that.

Recommendations

Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of this heritage report, there are no significant cultural heritage resources barriers to the proposed development project. SAHRA/ KwaZulu-Natal Amafa and Research Institute may approve the project as planned with special commendations to implement the recommendations here in made:

1. It is recommended that SAHRA/ KwaZulu-Natal Amafa and Research Institute endorse the report as having satisfied the requirements of Section 38 (8) of the NHRA requirements;

2. It is recommended that SAHRA/ KwaZulu-Natal Amafa and Research Institute make a decision in terms of Section 38 (4) of the NHRA to approve the proposed coal prospecting right application;

3. The study area is littered with buildings and structures, however, no prospecting is to occur within the vicinity of these structures;

4. The study yielded archaeological finds in terms of stone tools and potsherds, the artefacts were documented, however, they were found on the surface out of context, and are therefore of low significance;

5. The identified burial sites within the study area should be protected from prospecting activities, therefore, a 100m buffer zone between the identified burial sites and prospecting activities must be maintained;

6. The possibility of chance finds is ever present within the study area and during the prospecting phase the developer is urged to be careful and heedful of that; and

7. From a heritage perspective supported by the findings of this study, the project is supported. However, prospecting activities should be approved under observation that the dimensions do not extend beyond the area considered in this report.

Conclusions

A thorough background study and survey of the proposed development was conducted in line with SAHRA guidelines. As per the recommendations above, the project may proceed subject to adherence of the above recommendations.

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ACRONYMS AND ABBREVIATIONS

AIA	Archaeological Impact Assessment
AMAFA	KwaZulu-Natal Amafa and Research Institute
EMP	Environmental Management Plan
HIA	Heritage Impact Assessment
LIA	Late Iron Age
MIA	Middle Iron Age
EIA	Early Iron Age
HMP	Heritage Management Plan
LSA	Late Stone Age
MSA	Middle Stone Age
ESA	Early Stone Age
NASA	National Archives of South Africa
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Authority
SAHRA	South African Heritage Resources Agency

GLOSSARY OF TERMS

The following terms used in this Archaeology are defined in the National Heritage Resources Act [NHRA], Act Nr. 25 of 1999, South African Heritage Resources Agency [SAHRA] Policies as well as the Australia ICOMOS Charter *(Burra Charter)*:

Archaeological Material: remains resulting from human activities, which are in a state of disuse and are in, or on, land and which are older than 100 years, including artifacts, human and hominid remains, and artificial features and structures.

Artefact: Any movable object that has been used, modified or manufactured by humans.

Conservation: All the processes of looking after a site/heritage place or landscape including maintenance, preservation, restoration, reconstruction and adaptation.

Cultural Heritage Resources: refers to physical cultural properties such as archaeological sites, palaeolontological sites, historic and prehistorical places, buildings, structures and material remains, cultural sites such as places of rituals, burial sites or graves and their associated materials, geological or natural features of cultural importance or scientific significance. This include intangible resources such religion practices, ritual ceremonies, oral histories, memories indigenous knowledge.

Cultural landscape: "the combined works of nature and man" and demonstrate "the evolution of human society and settlement over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both internal and external".

Cultural Resources Management (CRM): the conservation of cultural heritage resources, management, and sustainable utilization and present for present and for the future generations

Cultural Significance: is the aesthetic, historical, scientific and social value for past, present and future generations.

Chance Finds: means Archaeological artefacts, features, structures or historical cultural remains such as human burials that are found accidentally in context previously not identified

during cultural heritage scoping, screening and assessment studies. Such finds are usually found during earth moving activities such as water pipeline trench excavations.

Compatible use: means a use, which respects the cultural significance of a place. Such a use involves no, or minimal, impact on cultural significance.

Conservation means all the processes of looking after a place so as to retain its cultural significance.

Expansion: means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

Grave: A place of interment (variably referred to as burial), including the contents, headstone or other marker of such a place, and any other structure on or associated with such place.

Heritage impact assessment (HIA): Refers to the process of identifying, predicting and assessing the potential positive and negative cultural, social, economic and biophysical impacts of any proposed project, plan, programme or policy which requires authorisation of permission by law, and which may significantly affect the cultural and natural heritage resources. The HIA includes recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Historic Material: remains resulting from human activities, which are younger than 100 years, but no longer in use, including artifacts, human remains and artificial features and structures.

Impact: the positive or negative effects on human well-being and / or on the environment.

***In situ* material:** means material culture and surrounding deposits in their original location and context, for instance archaeological remains that have not been disturbed.

Interested and affected parties Individuals: communities or groups, other than the proponent or the authorities, whose interests may be positively or negatively affected by the proposal or activity and/ or who are concerned with a proposal or activity and its consequences.

Interpretation: means all the ways of presenting the cultural significance of a place.

Late Iron Age: this period is associated with the development of complex societies and state systems in southern Africa.

Material culture means buildings, structure, features, tools and other artefacts that constitute the remains from past societies.

Mitigate: The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts of an action.

Place: means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

Protected area: means those protected areas contemplated in section 9 of the NEMPAA and the core area of a biosphere reserve and shall include their buffers.

Public participation process: A process of involving the public in order to identify issues and concerns and obtain feedback on options and impacts associated with a proposed project, programme or development. Public Participation Process in terms of NEMA refers to: a process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to specific matters.

Setting: means the area around a place, which may include the visual catchment.

Significance: can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgments and science-based criteria (i.e. biophysical, physical cultural, social and economic).

Site: a spatial cluster of artifacts, structures, organic and environmental remains, as residues of past human activity.

1 INTRODUCTION

At the request of Vahlengwe Mining Advisory and Consulting (Pty) Ltd on behalf of Saqondisana Investments (Pty) Ltd, Ruins Archaeo Heritage Consulting (Pty) Ltd conducted an Archaeological and Cultural Heritage Impact Assessment study for the proposed coal prospecting right application on the Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT and Farm Ravine 9201 GT in the Magisterial District of Estcourt, KwaZulu-Natal Province. The survey was conducted in accordance with the SAHRA Minimum Standards for the Archaeology and Paleontology Study. The minimum standards clearly specify the required contents of the report of this nature. The study aims to identify and document archaeological sites, cultural resources, sites associated with oral histories, graves, cultural landscapes, and any structure of historical significance that may be affected by the proposed development, these will in turn assist the developer in ensuring proper conservation measures in line with the National Heritage Resource Act, 1999 (Act 25 of 1999).

2 SITES LOCATION AND DESCRIPTION

Saqondisana proposes to undertake coal prospecting activities in respect of the Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT and Farm Ravine 9201 GT within the Magisterial District of Estcourt, KwaZulu-Natal Province. The planned invasive prospecting activities will cover an area of at least 0.305 ha. The project entails the drilling of about twenty (20) boreholes to determine the mineral deposition, quantity, economic viability, and possibilities of the project leading to a viable mine. The proposed prospecting area is situated 36, 63 km southeast of Ladysmith town and 29, 60 km southeast of Umbulwana Village and access road to the farm is via the R74 road, in the Estcourt District in KwaZulu Natal Province.

The prospecting activities will include the following activities:

Establishment of the office and equipment storage site:

- The site will be cleared of vegetation and levelled where the mobile site offices will be installed.
- No topsoil will be removed for this activity.
- Vegetation clearance of an extent area of 30x30m will be undertaken for the establishment of the site camp offices and auxiliary equipment for the operation.

Installation of mobile offices and ablutions.

- Mobile offices and portable ablutions will be installed on the established site.

Construction of temporal access road to the camp.

- Temporal access roads to the site camp and drill sites will be constructed within the proposed area.
- However existing farm roads will be utilized as far as practicable.

Drilling

- Drilling of twenty (20) boreholes will be undertaken using a grid drilling pattern to a maximum depth of 200 m with each borehole sump area of 10m length x 10m breath.

Rehabilitation and closure.

- Concurrent rehabilitation of the drill holes will be conducted after each drilling is completed.

- The drill holes will be backfilled of material in their respective manner and the drilled hole to be closed with a cap.
- The final rehabilitation of the site will be conducted including the rehabilitation of the office and equipment storage site footprint, drill sites and access roads.
- The rehabilitation plan will be included within the EMPr which forms part of this report to be submitted to the Department of Mineral Resources and Energy (DMRE).

Project Phases

The prospecting activities will be undertaken in four (4) phases for a total duration of about 48 month, thus five years with subject to renewal for 3 years should the prospecting programme not be completed within the first term of granting. The prospecting phases will be conducted as follows:

Phase 1

- Desktop Studies

A desktop study will be carried out to obtain all possible geological information and historical data of the proposed prospecting area. This includes the review of published geological reports, data from the Council of Geoscience and relevant geological research within the proposed area.

- Reconnaissance Survey

A geological reconnaissance survey of the proposed area will be undertaken to assess the potential coal deposit and to comparatively evaluate the preferred deposit. This survey will generally be carried out for examination of the general geological features and characteristics of a region.

- Geological Field Mapping

A geological field mapping will be conducted to obtain information about the surface lithologies and geological features and structures hence a geological map will be the outcome of this activity.

- Geophysical Survey

Information will need to be gathered from undiscovered hidden coal deposits below the surface. A field data will be obtained based on the principles and guidelines. A GPS will be used to record the data point locations, and no access roads will be constructed for this survey.

- RC/DC Drilling

Boreholes will be drilled at pre-determined sites on the proposed area. A 165mm diameter core drill will be used to drill the geological boreholes. At least twenty (20) boreholes will be drilled

using a grid drilling pattern at a maximum depth of 200 m. The exact of respective borehole positions will heavily rely on the data received from geophysical survey. The spacing between boreholes shall be decreased appropriately where significant quality changes occur in structurally complex area and along the seam sub-outcrop.

- Concurrent Rehabilitation

After each borehole is completely drilled and does not show any occurrence, it will be fully rehabilitated. Rehabilitation will only be done by backfilling of material in their respective manner and closing the drilled hole with a cap.

Phase 2

- Core Logging

All drill holes will be logged every meter containing information such as hole location, depth and other geological structures encountered within the hole. Dust samples will be taken in sealed chip trays and safeguarded for future referencing. Portions of the drill chips representing the ore will be taken and placed in bags for analysis.

- Sample Analysis

All samples obtained from the drilling programme will be taken to the accredited laboratory for analysis and quality.

Phase 3

- Banking & Feasibility Studies Geological Modelling

The outcome of the prospecting work will determine whether the project is viable or not. This phase will comprise of the following key aspects:

A mineral resource estimation will be conducted and compiled into a Mineral Resources and Reserves Statement to be signed by a competent person. The estimation will include the tonnages and quality of the mineral. Should the results prove positive, the preparations for mining right application and any other relevant applications will commence. More various technical personnel will be involved in the process. The skills cycle will include geology, mine engineering, mine surveying, metallurgy, legal and finance.

Phase 4

- Rehabilitation and closure

Final rehabilitation of the site will be conducted as the final phase of the prospecting activities and will be undertaken upon cessation of the project.

Table 1: Summary of project location details.

Province	KwaZulu Natal
District Municipality	uThukela
Local Municipality	Inkosi Langalibalele
Affected farms	Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT and Farm Ravine 9201
Proposed development	Coal Prospecting Right Application
DMRE Reference	KZN 30/5/1/1/2/11694 PR

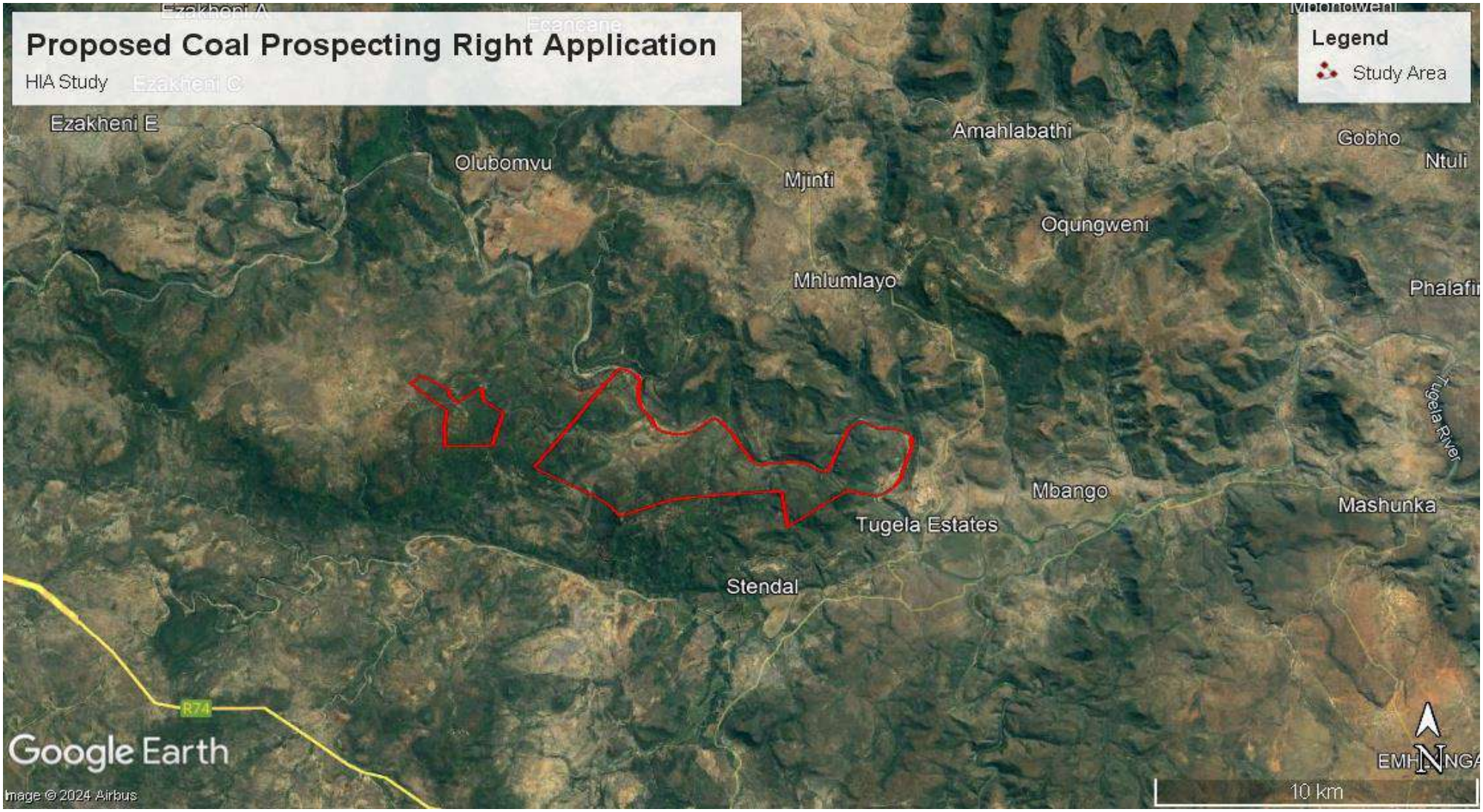

Figure 1: Locality Map of the site proposed for the development (Author 2024).

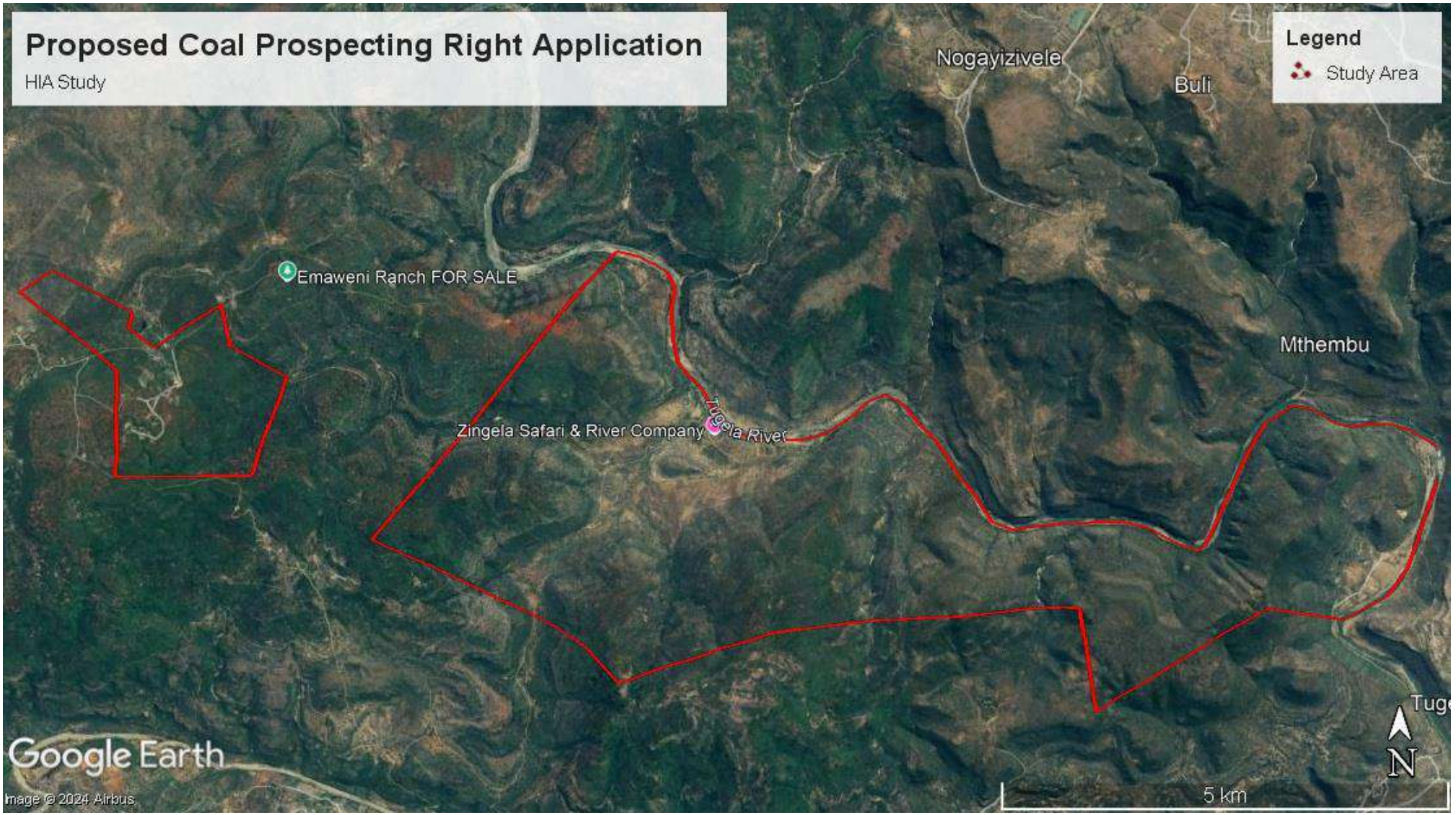

Figure 2: Google Earth view of the study area (Author 2024).

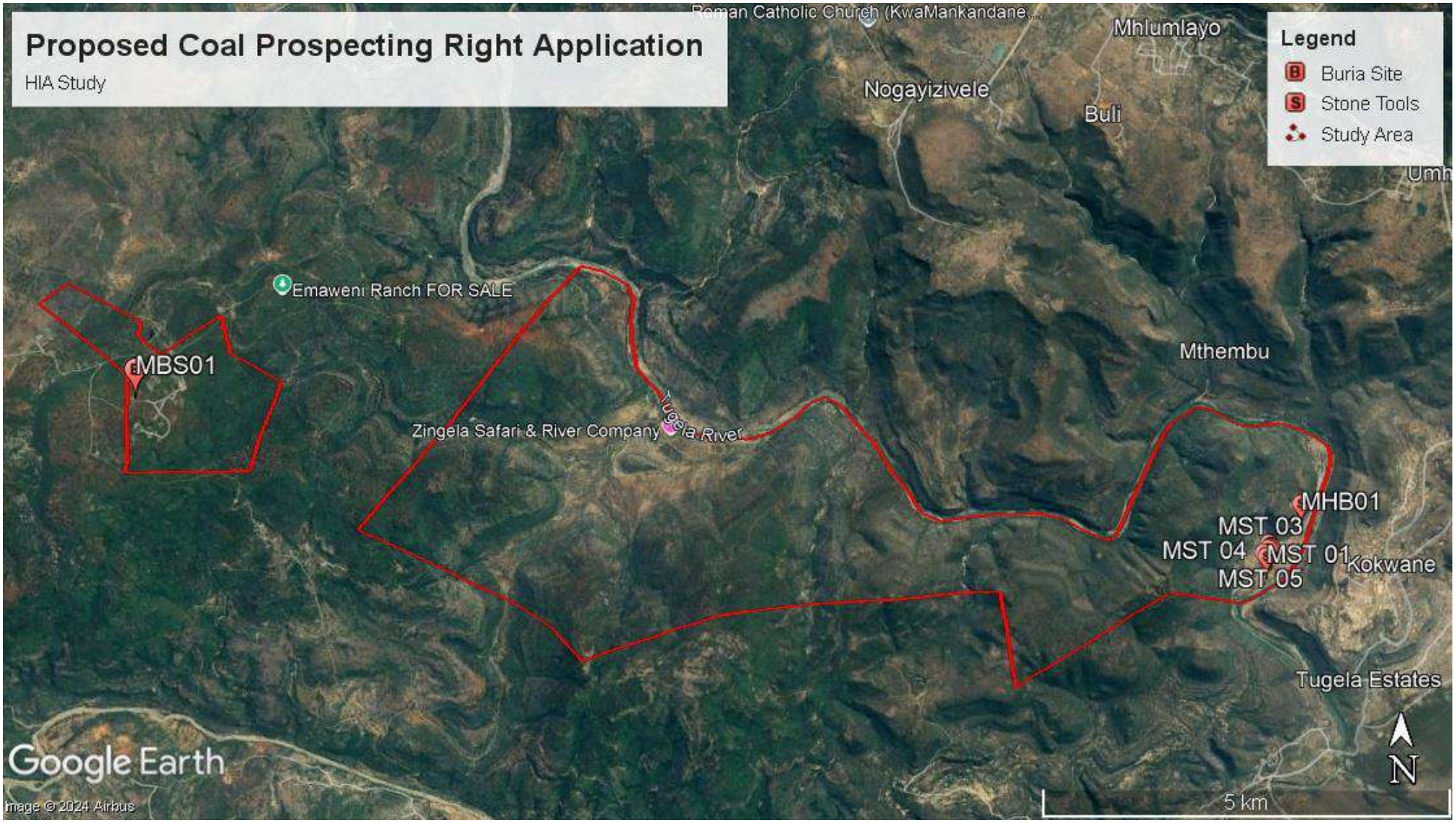

Figure 3: Identified Heritage sites within the study area (Author 2024).

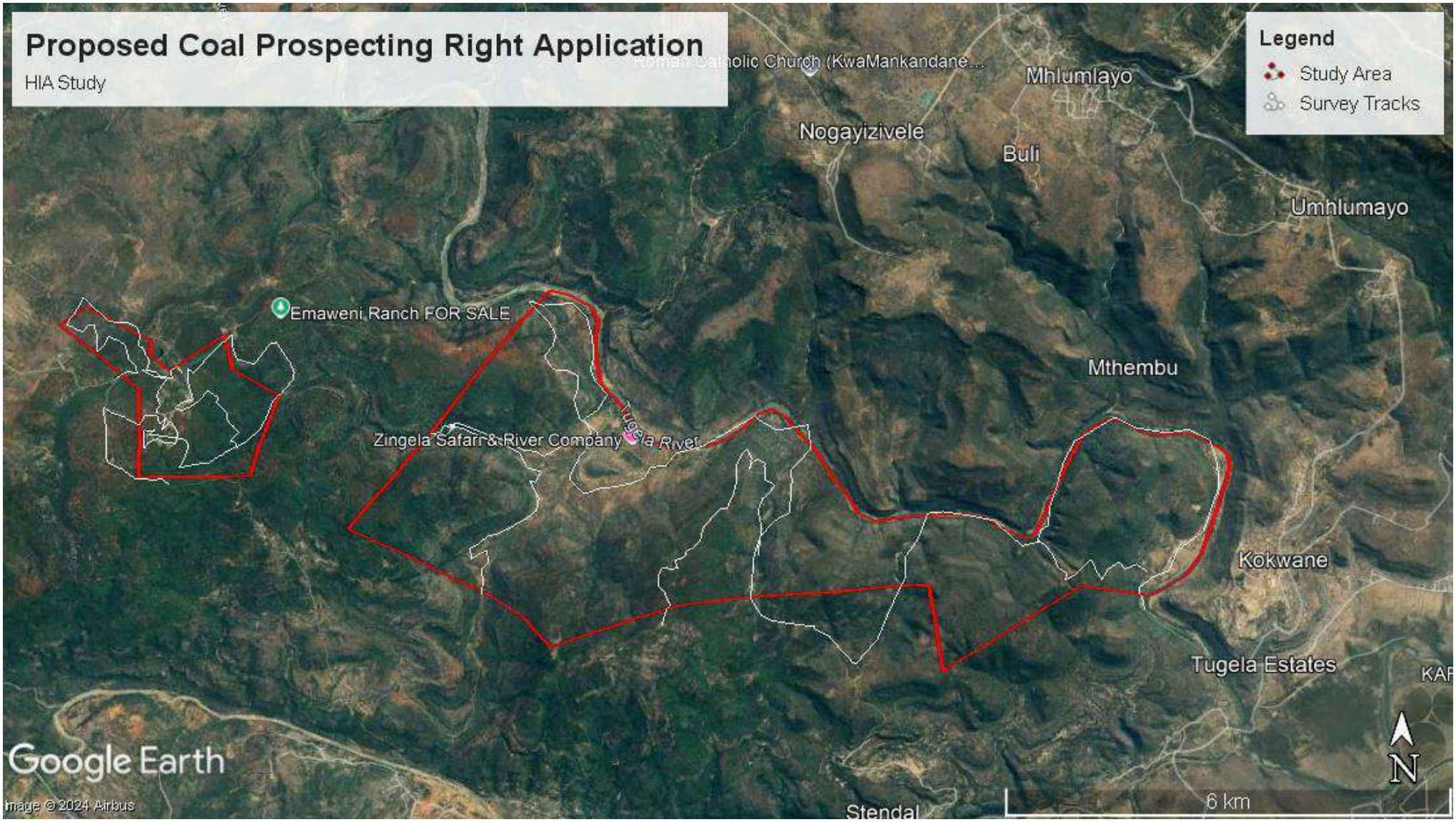

Figure 4: Survey tracks within the study area (Author 2024).

PHOTOGRAPHS OF THE STUDY AREA

Figure 5: General view of the site showing the proposed development site.

Figure 6: A view of the proposed development site cleared within mountainous terrain.

Figure 7: View of dense vegetation on a portion of the site proposed for the development.

Figure 8: View of another section of the site proposed for the development.

Figure 9: Showing site is heavily disturbed: note the existing borrow pit.

Figure 10: View of the site showing mountainous terrain and dense vegetation.

Figure 11: View of the Tugela River which borders the site.

Figure 12: Showing cleared section within the study area.

Figure 13: Showing the study area on the right and the Tugela River on the left.

Figure 14: Showing existing access roads within the study area.

Figure 15: Showing another section within the study area.

Figure 16: View of a cleared section within the study area.

Figure 17: View of another section of the study area.

Figure 18: Showing the study area is heavily disturbed: note sand mining taking place.

Figure 19: Showing a section of the study area along the Tugela River.

Figure 20: Showing a section of the study area along mountainous terrain.

3 PURPOSE OF THE CULTURAL HERITAGE STUDY

The purpose of this Archaeological and Cultural Heritage study was to entirely identify and document archaeological sites, cultural resources, sites associated with oral histories, graves, cultural landscapes, and any structure of historical significance that may be affected by the proposed prospecting, these will in turn assist the developer in ensuring proper conservation measures in line with the National Heritage Resources Act, 1999 (Act 25 of 1999). Impact assessments highlight many issues facing sites in terms of their management, conservation, monitoring and maintenance, and the environment in and around the site. Therefore, this study involves the following:

- Identification and recording of heritage resources that may be affected by the proposed coal prospecting application
- Providing recommendations on how best to appropriately safeguard the identified heritage sites. Mitigation is an important aspect of any development on areas where heritage sites can be identified.

4 METHODOLOGY AND APPROACH

The methods utilised in this study are informed by the 2012 SAHRA Policy Guidelines for impact assessment. To achieve the purpose and objectives different sources were used, this includes;

I. Literature review

Relevant literature was consulted through the SAHRIS website, with an intention to review previous Cultural Heritage Impact Assessments conducted in and around the area of the proposed development. Various archaeological, historical sources and recently published and unpublished books were used to aid this study.

II. Field survey

The field survey was undertaken by the author on the **10th of October 2024.**The survey made use of the vehicle to get to the site, and the site was surveyed using a vehicle and on foot. The survey covered the entire servitude of the proposed development.

III. Public Participation

A public participation process will be undertaken by the project EAP to gather the issues and concerns of interested and affected parties (IAPs) and Authorities, including community leaders. The process consists of contacting the IAPs, having a public meeting with the stakeholders and informing and engaging with them on the project proposal. The issues raised will be incorporated in the EIA/EMP where relevant and outcome of heritage issues will be forwarded to the Author.

IV. Documentation

In line with the appropriate legislation, the site was documented by taking photographs using a camera 10.1 mega pixel Sony Cybershort Digital Camera and plotting of finds using a Garmin etrex Venture HC.

V. Restriction and assumption

Underground heritage may not be represented on the surface making the identification difficult. This serves as considerable limitation. Should any cultural material be identified when the development begins, a specialist must be consulted to examine the finds.

5 APPLICABLE HERITAGE LEGISLATION

Three main pieces of legislations are relevant to the present study and there are presented here. Under KwaZulu-Natal Amafa and Research Institute Act No. 05 of 2018, the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA), an AIA or HIA is required as a specialist sub-section of the Basic Assessment (BA) process. This report is also required in terms of Section 23(a), (b) and (c) of the Minerals and Petroleum Resources Development read together with regulations 11(1) (g) of the Mineral and Petroleum Resources Development Act 28 of 2002).

General protection for Structures,

37.(1)(a) No structure which is, or which may reasonably be expected to be, older than 60 years, may be demolished, altered or added to without the prior written approval of the Institute having been obtained on written application to the Institute.

(b) Where the Institute does not grant approval, the Institute must consider special protection in terms of sections 44, 45, 46, 47 and 49 of Chapter 9.

(2) The Institute may, by notice in the Gazette, exempt –

(a) a defined geographical area; or

(b) defined categories of sites within a defined geographical area,

from the provisions of subsection (1) where the Institute is satisfied that heritage resources falling in the defined geographical area or category have been identified and are adequately protected in terms of sections 44, 45, 46, 47 and 49 of Chapter 9.

(3) A notice referred to in subsection (2) may, by notice in the Gazette, be amended or withdrawn by the Institute.

General protection: Graves of victims of conflict

38. No person may damage, alter, exhume, or remove from its original position –

(a) the grave of a victim of conflict.

(b) a cemetery made up of such graves; or

(c) any part of a cemetery containing such graves, without the prior written approval of the Institute having been obtained on written application to the Institute and in terms of the Regulations to this Act

General protection: Graves of victims of conflict

39. (1) No grave or burial ground older than 60 years, or deemed to be of heritage significance by a heritage authority –

(a) not otherwise protected by this Act; and

(b) not located in a formal cemetery managed or administered by a local authority,

may be damaged, altered, exhumed, inundated, removed from its original position, or otherwise disturbed without the prior written approval of the Institute having been obtained on written application to the Institute.

(2) The Institute may only issue written approval once it is satisfied that –

(a) the applicant has provided evidence of efforts to consult with communities or descendants who may have an interest in the grave, using the guidelines and criteria for consultation set out in regulations; and

(b) the applicant and the relevant communities or descendants have reached agreement regarding the grave

General protection: Battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite or meteorite impact sites

40.(1) No person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Institute having been obtained on written application to the Institute.

(2) Upon discovery of archaeological or palaeontological material or a meteorite by any person, all activity or operations in the general vicinity of such material or meteorite must cease forthwith and a person who made the discovery must submit a written report to the Institute without delay.

(3) The Institute may, after consultation with an owner or controlling authority, by way of written notice served on the owner or controlling authority, prohibit any activity considered by the Institute to be inappropriate within 50 metres of a rock art site.

(4) No person may exhume, remove from its original position or otherwise disturb, damage, destroy, own or collect any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Institute having been obtained on written application to the Institute

(5) No person may bring any equipment which assists in the detection of metals and archaeological and palaeontological objects and material, or excavation equipment onto any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, or meteorite impact site, or use similar detection or excavation equipment for the recovery of meteorites, without the prior written approval of the Institute having been obtained on written application to the Institute.

(6)(a) The ownership of any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site, on discovery, vests in the Provincial Government and the Institute is regarded as the custodian on behalf of the Provincial Government.

(b) The Institute may establish and maintain a provincial repository or repositories for the safekeeping or display of

(i) archaeological objects;

(ii) palaeontological material;

(iii) ecofacts;

(iv) objects related to battlefield sites;

(v) material cultural artefacts; or

(vi) meteorites.

(7) The Institute may, subject to such conditions as the Institute may determine, loan any object or material referred to in subsection (6) to a national or provincial museum or institution.

(8) No person may, without the prior written approval of the Institute having been obtained on written application to the Institute, trade in, export or attempt to export from the Province –

(a) any category of archaeological object;

(b) any palaeontological material;

(c) any ecofact;

(d) any object which may reasonably be regarded as having been recovered from a battlefield site;

(e) any material cultural artefact; or

(f) any meteorite.

(9)(a) A person or institution in possession of an object or material, referred to in paragraphs (a) - (f) of subsection (8), must submit full particulars of such object or material, including such information as may be prescribed, to the Institute.

(b) An object or material referred to in paragraph (a) must, subject to paragraph (c) and the directives of the Institute, remain under the control of the person or institution submitting the particulars thereof.

(c) The ownership of any object or material referred to in paragraph (a) vests in the Provincial Government and the Institute is regarded as the custodian on behalf of the Provincial Government.

Heritage resources management

41.(1) Any person who intends to undertake a development categorised as –

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;

(b) the construction of a bridge or similar structure exceeding 50 m in length;

(c) any development or other activity which will change the character of a site –

(i) exceeding 5 000 m2 in extent;

(ii) involving three or more existing erven or subdivisions thereof;

(iii) involving three or more erven or divisions thereof, which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations;

(d) the rezoning of a site exceeding 10 000 m2 in extent; or

(e) any other category of development provided for in regulations,

must, at the very earliest stages of initiating such a development, notify the Institute and furnish it with details regarding the location, nature and extent of the proposed development.

(2) The Institute must, within 14 days of receipt of a notification in terms of subsection (1) –

(a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report: Provided that such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the Institute with relevant qualifications and experience and professional standing in heritage resources management; or

(b) notify the person concerned that this section does not apply.

(3) The Institute must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included –

(a) the identification and mapping of all heritage resources in the area affect;

(b) an assessment of the significance of such resources in terms of the heritage assessment criteria set out in regulations;

(c) an assessment of the impact of the development on such heritage resources;

(d) an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;

(e) the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;

(f) the consideration of alternatives, if heritage resources will be adversely affected by the proposed development; and

(g) plans for mitigation of any adverse effects during and after the completion of the proposed development.

(4) The report must be considered timeously by the Institute which must, after consultation with the person proposing the development, decide –

(a) whether or not the development may proceed;

(b) any limitations or conditions to be applied to the development;

(c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;

(d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and

(e) whether the appointment of specialists is required as a condition of approval of the proposal.

(5) The Institute must not make any decision under subsection (4), with respect to any development which impacts on a heritage resource protected at national level, unless it has consulted the heritage resources authority.

(6) The applicant may appeal against the decision of the Institute to the responsible Member of the Executive Council, who –

(a) must consider the views of both parties; and

(b) may, at his or her discretion –

(i) appoint a committee to undertake an independent review of the impact assessment report and the decision of the Institute; and

(ii) consult the National Heritage Resources Agency; and

(c) must uphold, amend or overturn such decision.

(7) The provisions of this section do not apply to a development described in subsection (1) affecting any heritage resource formally protected by the National Heritage Resources Agency unless the Institute decides otherwise.

(8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that –

(a) the evaluation fulfils the requirements of the Institute in terms of subsection (3); and

(b) any comments and recommendations of the Institute with regard to such development have been taken into account prior to the granting of the consent.

(9) The Institute, with the approval of the responsible Member of the Executive Council, may, by notice in the Provincial Gazette, exempt from the requirements of this section any place specified in the notice.

(10) Any person who has complied with the decision of the Institute in subsection (4) or of the responsible Member of the Executive Council in terms of subsection (6) or other requirements referred to in subsection (8), is exempted from compliance with all other protections in terms of this Part, but any existing heritage agreements made in terms of section 42 continue to apply.

Other sections of the NHRA Act with a direct relevance to the AIA are the following:

Section 34(1) *No person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.*

Section 35(4) *No person may, without a permit issued by the responsible heritage resources authority:*

- *destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site or any meteorite*

Section 36 (3) *No person may, without a permit issued by SAHRA or a provincial heritage resources authority:*

- *destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside formal cemetery administered by a local authority; or*
- *bring onto or use at a burial ground or grave any excavation equipment, or any equipment which assists in detection or recovery of metals.*

6 ARCHAEOLOGY AND HISTORY OF THE AREA

The archaeology of southern Africa is broadly divided into Stone Age, Iron Age and the Historical Age, and South Africa fits well into this periodisation.

6.1 The Stone Age

The Stone Age is the period in history of human evolution when lithic material was mainly used to make tools (Robins et al. 1998). In South Africa, in line with the picture in southern Africa, the period is divided into three phases. It is important to note that these dates are relative and only provide a broad framework for interpretation. The division for the Stone Age according to Lombard et al 2012: 125 is as follows

- Earlier Stone Age (ESA) 2 million-150 000 years ago
- Middle Stone Age (MSA) 150 000-30 000 years ago.
- Later Stone Age (LSA) 40 000-1840 A.D

The Archaeological history of the KwaZulu-Natal (KZN) Province dates back to about 2 million years, marking the beginning of the Stone Age period. The ESA of the region have produced very little with regards to material culture, and as a result very little is known about the ESA of the region. Olivier Davies, a pioneer archaeologist in the region being the only person to have researched on the ESA period in the province recognized different traditions of the ESA in which the traditions are characterised by heavy tools made from cores, such as scrapers, picks, handaxes and cleavers (Davies 1974; Mazel 1989).Other than the stone tools, very little has been produced from the ESA sites in the province. The information on the diet of the ESA people in the province is sketchy; however, it can be assumed that their menu consisted of animals and plant food (Mazel 1989).

The Middle Stone Age (MSA) is better researched in the province with widely known sites such as Umhlatuzana Rock Shelter (Butzer et al. 1978), Sibudu Cave (Wadley 1996), Border Cave (Cooke et al. 1945), Umbeli Belli Rock Shelter (Mitchell 1998). The MSA was replaced by the Later Stone Age (LSA).Just like anywhere in South Africa, the LSA is characterised by smaller tools but still performed the same tasks as those before. There are many LSA sites in the province, these include Mgede Shelter (Mazel 1988), KwaThwaleyakhe Shelter (Mazel 1993), Inkolimahashi Shelter (Mazel 1999).The LSA of the KZN Province is dominated by its amazingly beautiful rock art at sites such as Game Pass, the Giants Castle, to name but a few (Williams 1981; Wilcox 1990; Hoerle & Solomon 2004, Nhundu 2015).

According to the KwaZulu-Natal Museum data base, there are eleven ESA sites, twenty-eight MSA and fourteen LSA in the wider project area (Prins 2015: 2). Most of the Stone Age sites occur in open air contexts as exposed by sheet erosion as the ground is left bare by overgrazing which is rampant in the region (Pelser 2015). As for the LSA, the majority of the sites occur as rock art sites further west in the foothills of the Drakensberg mostly in small shelters of sandstone formations (Mazel 1989). Closer to the study area, rock art have been documented at Estcourt, Mooi River and Dundee (Wan der Walt 2015).

6.2 The Iron Age

The Iron Age is the period in human history when metal was mainly used to produce tools. The primary technology used by the Bantu people was the 'Iron hoe', hence the advent of the Iron Age designate the period which these groups expanded throughout southern Africa (Huffman 2000; 2007). In South Africa, the period is divided into two separate phases namely Early Iron Age (EIA) 200-1000A.D and Late Iron Age (LIA) 1000-1850A.D. Huffman (2007:361), however, indicates that a Middle Iron Age must be included although some feel that Middle Iron Age should be restricted to the Limpopo. His dates which now seem to be widely accepted in South Africa are:

- Early Iron Age (EIA) 250-900 A.D
- Middle Iron Age (MIA) 900-1300 A.D
- Late Iron Age (LIA) 1300-1840 A.D

The Iron Age of the KwaZulu-Natal region dates back to the 5th Century AD when the Early Iron Age (EIA) proto-Bantu-speaking farming communities began arriving in this region, which was then occupied by hunter-gatherers. These EIA communities are archaeologically referred to as the Kwale branch of the Urewe EIA Tradition (Huffman, 2007: 127-9). The Iron Age communities occupied the foothills and valley lands introducing settled life, domesticated livestock, crop production and the use of iron (also see Maggs 1984a, 1984b; Huffman 2007). Alongside the Urewe Tradition was the Kalundu Tradition whose EIA archaeological sites have been recorded along the KwaZulu-Natal region. From about 15 00 AD the region was occupied by new coming groups of Late Iron Age farmers of the Kalundu Tradition (ibid). The region was the centre of immigration and migration of different African groups some of which are ancestors of the contemporary Zulu predominant in the region.

Farming communities settled in the general project area around 800 years ago, the earliest and closest documented site date to approximately 1200 AD is called Moor Park after the type site

located at Moor Park Nature Reserve (Huffman 2007). As for the EIA of the general project area, the area was occupied by Nguni-speaking groups such as the amaBhele and related groups (Byrant 1965). However, their stay was short-lived as they were disposed off the land in the 1820s by the expansionist policies of Shaka. African refugee groups and some groups such as the amaHlubi were given permission to settle in the area by the British colonial authorities in 1845. After the Anglo-Boer War of 1899 and the Bambatha Rebellion of 1911 many of the African people in the general project area adopted a Zulu ethnicity.

6.3 Historical Period

The Greater Zululand was christened Natal by the Portuguese explorer Vasco da Gama in 1497.The colonial history of KZN starts around 1820 when early English ivory traders established themselves at Port Natal (Durban), at a time when Shaka, king of the Zulu was firmly in charge of the area. It is argued that the kingdom he established remained the most powerful in the region throughout the 19th century (Wright & Hamilton 1989). The British colony of Natal grew from a coastal settlement which was already well established by 1824 with the permission of Shaka. Shaka's majesty rule came to an end in 1828 when he was assassinated by his half-brothers Dingane and Mhlangana, with Dingane eventually taking over the kingship (Wright & Hamilton 1989). In 1837 Piet Retief led the Dutch descendants, the Vootrekkers into Natal (Stapleton 2017). Interestingly the old wagon road which they used in 1838 when they were trooping down the slopes of the Drakensberg mountains into Pietermaritzburg can still be seen today (Oberholser 1972). Piet Retief was murdered when he attempted to treat for a grant of land with the new Zulu Chief, Dingane. This, and the consequent slaughter of many whites in the region led to the Port Natal being abandoned.

After several wars, the Boers triumphed against the Zulus at the Battle of the Blood River in December 1837. This gave birth to the Republic of Natalia with its headquarters in Pietermaritzburg. Britain's interest in having an additional port *en* route to India motivated them to re-occupy Port Natal in 1843. Late in the 19th Century, gold was discovered at Elandslaagte Dundee and Newcastle. The discovery of gold at these places further increased Britain's economic and commercial interest in maintaining control of the general project area. Natal was therefore seen as a secure British base by the time the Anglo-Boer War broke out in 1899 (Evans 2000); Colenso was also not spared by all these developments.

As for the Anglo-Boer War, the British won the light battle at Elandslaagte, but they were heavily defeated at the fearsome battle of Nicholson's Nek on 30 October 1899. The British suffered a heavy defeat with 38 dead, and 105 wounded compared to only 4 deaths and 5 wounded on the Boers side. Close to 1000 British soldiers went into captivity after the war underling the point that the British were soundly defeated in the region.

6.4 Coal mining history in the study area

The presence of coal in the Greater Dundee area was observed by many early travelers. The Voortrekkers, during their battles with the Zulus found coal in the beds of streams such as the Steenkoolspruit (coal stream) and in 1839 the British garrison commander in Durban, Captain Jervis, sent samples of coal to the Governor of the Cape. In their kitchens farmers burned coal obtained from surface outcrops on their lands and it was one of them, Peter Smith of Talana farm, who started sending wagonloads of coal to be marketed in Pietermaritzburg. This enterprise, in 1862, actually started the coal industry. In 1880 the first proper geological survey was made of the Natal coalfields, by which it was proved that workable deposits were found on the farms Dundee and Coalfields. By that time, Peter Smith had already marketed over 7000 tonnes of coal. With Dugald MacPhail and Charles Wilson as partners, he developed mining substantially, forming the Dundee Coal and estate Company. In 1882 he laid out a town on the farm Dundee to create a center for the coalfields. In 1902 this township finally became a municipality.

6.5 Brief History of Colenso

Colenso is located 229km north-west of Durban and 27km south of uMnambithi, formerly Ladysmith (Raper 2004). It was established in 1855, and became a township in 1926 and borough in 1958 (Raper 2004). At first it was called the Greater Tugela Drift as it was one of the major stopover points for the flourishing wagon transport trail between Durban, Johannesburg and Free State (https:www.battlefieldsroute.co.za>places>Colenso). In 1855, it was re-named Colenso after Bishop John William Colenso (1814-1883), first Anglican Bishop of Natal and champion of the Zulus (Raper 2004). It is also known as Eskipeni (Zulu for place of the Boat) (https://wwww.kwazulu-natal –info.com>), however, the basis for this name is not known. Colenso was a battlefield for the 2nd Anglo-Boer War on 15 December 1899 (https://en.wikipedia.org>wiki>battle-of-colenso>). It was used by the British as their base. The Battle of Colenso saw British forces advancing on 3 fronts against the Boers under General Louis Botha, with the intention to overwhelm the Boers who at that time had Ladysmith under siege. The British were soundly defeated. Scenes of the battles during the 2nd Anglo-Boer War

includes the strategic railway bridge there. There is a Museum in Colenso. The museum is also known as the Robert E Stevenson Museum because of the military historian and former Director of Natal Hospital Services contribution to its annuals. The museum holds a detailed documentation of the wars fought in Colenso.

7 PREVIOUS HERITAGE IMPACT STUDIES

There are few Cultural Resources Management (CRM) studies that have been carried out within the project area. It should be noted that these reports are generally from within 20 km of the study area, but some studies here from the wider project area have only been included here to provide a significant contribution to the assessment. These studies show the nature of the heritage of the study area. The studies have recorded burial sites and historical buildings. The sites have also yielded stone walling, Iron Age artefacts, stone cairns and Stone Age tools. Below is a table of summary for the studies as well as findings for these assessments conducted in the study area and its immediate surroundings.

Table 2: A summary table of previous heritage studies conducted in the locality and vicinity of the project area:

Author/Year	Local Municipality	Farm name (s)	Findings
Pelser (2019)	uMnambithi	Klip River Location 4665 GT (formerly Bomvu 17485) Reserve No. 19 15839 GU (previously Ngono 1752) Tugela Location 4674GT	No cultural resources of significance
Wan der Walt (2017)	uMnambithi	Elandsspruit 5523	No heritage resources
Pelser (2015)	Estcourt	Schurfe Poort 1147 (portion 1 and remainder) Lobuschagne's Kraal 1229 (various portions) Varkens Fontein 1138 (portion 19) Cromleybank 1146 (portions 5 & 7) Clapharm Kloof 11318 remainder and Riet Butt 1213 portion 4	Farmsteads Possible graves Single piece of pottery Broken lower grinding stone Upper grinder
Prins (2015)	Okhahlamba	Kopleegte No. 1154	No cultural resources of any significance
Prins & Hall (2015)	uMnambithi	various	Twenty-one cultural heritage sites; LIA sites, Anglo-Boer War period sites, homesteads,

			farmsteads older than 60 years, public buildings older than 60 years, 1 memorial site and 2 contemporary places of worship.
Prins & Hall (2013)	uMnambithi	Various	Five sites; a cemetery and stone walling structures.
Seliane (2008)	uMnambithi		No sites were recorded
eThembeni Cultural Heritage	Estcourt	Zaaifontein	Labour tenants homesteads Two possible attendant ancestral graves

8 DEGREE OF SIGNIFICANCE

Assessment of significance is important in this study as it provides rating of the impact prompted by the proposed development on heritage resources. The assessment of significance gives mitigation measures to limit the effects of the impact that could result as the cause of the development on heritage resources.

Table 3: Grading systems for the identified heritage resources in terms of the NHRA **(**Act 25 of 1999).

Level	Significance	Possible action
National (Grade I)	Site of National Value	Nominated to be declared by SAHRA
Provincial (Grade II)	Site of Provincial Value	Nominated to be declared by PHRA
Local Grade (IIIA)	Site of High Value Locally	Retained as heritage
Local Grade (IIIB)	Site of High Value Locally	Mitigated and part retained as heritage
General Protected Area A	Site of High to Medium	Mitigation necessary before destruction
General Protected Area B	Medium Value	Recording before destruction
General Protected Area C	Low Value	No action required before destruction

9 SURVEY FINDINGS

The Phase I Cultural-Heritage Impact Assessment study for the proposed coal prospecting right application on the Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT and Farm Ravine 9201 GT in the Magisterial District of Estcourt, KwaZulu-Natal Province identified upper grinding stones, broken lower grinding stones, potsherds and a single stone tool within the proposed development site. The area is close to the Tugela River and may have been a site due to its close proximity to the river. The findings are summarised in the Table below:

Table 4: Summary of Archaeological Finds

Site ID	GPS Coordinates	Description	Image reference	Mitigation Measures
MST 01	28°44'15.81"S 30° 8'23.66"E	Upper grinding stones	See Figure 21-22	The site is within 100m of the Tugela river and no prospecting activities are to occur in the vicinity
MST 02	28°44'12.10"S 30° 8'25.64"E	Broken lower grinding stone	See Figure 23-24	The site is within 100m of the Tugela river and no prospecting activities are to occur in the vicinity
MST 03	28°44'10.57"S 30° 8'24.51"E	Potsherds	See Figure 25	The site is within 100m of the Tugela river and no prospecting activities are to occur in the vicinity
MST 04	28°44'14.22"S 30° 8'22.32"E	Stone tool	See Figure 26	The site is within 100m of the Tugela river and no prospecting activities are to occur in the vicinity
MST05	28°44'12.60"S 30° 8'24.59"E	Upper grinder	See Figure 27-28	The site is within 100m of the Tugela river and no prospecting activities are to occur in the vicinity

Figure 21: Showing Upper grinding stone identified on site **MST01.**

Figure 22: Showing Upper grinding stone identified on site **MST01.**

Figure 23: Showing broken lower grinding stone identified on site **MST02.**

Figure 24: Showing upper grinding stone identified on site **MST02.**

Figure 25: Showing potsherds identified on site **MST03.**

Figure 26: Showing a weathered stone tool identified on site **MST04.**

Figure 27: Showing grinding stone identified on site **MST05.**

Figure 28: Showing grinding stone identified on site **MST05.**

It is important to note that burial sites are found close to abandoned settlements and Archaeological sites. Detecting the presence of archaeological human burials within the landscape can be challenging, as these burials are typically unmarked at the surface and concealed by dense vegetation cover, and graves may have been eroded and lay flat and can only be indicated by the presence of tightly packed stones or bricks as is the case. The study identified a grave **MBS01** on the GPS coordinates **28°43'4.25"S, 30° 0'3.37"E**. The burial site is a solitary grave marked by stone cairns located close to the cattle kraal within the homestead. The study further notes that burial sites exist within homesteads or close to cattle kraals and detailed photographic recording could not be done as it requires consent from the grave custodians. It is important to note that during the Public Participation Process to be conducted by the EAP, communities would be asked to declare their graves and if any issues are to arise, they would then be forwarded to the Author.

Figure 29: Showing the identified burial site **MBS01**. Note the blue arrow shows the identified grave.

The study area is located in an area with settlements, game reserves and associated infrastructure. The study noted that the area is littered with buildings and structures. Various collapsed stonewalled structures were identified close to a derelict dip tank, adjacent to the Tugela river at the site **MHB01** on the GPS coordinates **28°43'54.90"S 30° 8'39.07"E** . The study noted that according to Section 34 of the NHRA Act of 1999 read together with Section 37 of the KwaZulu-Natal Amafa and Research Institute Act No. 05 of 2018, no historic building or structure maybe altered, refurbished, reconditioned or demolished without a relevant heritage permit**.** The identified structures were noted to be safe from the development as no prospecting is to occur within the vicinity of the structures and buildings.

Figure 30: Showing the derelict dip tank identified on site **MHB01**.

Figure 31: Showing collapsed stone walling near derelict dip tank identified on site **MHB01.**

Figure 32: Showing collapsed stone walled structures near derelict dip tank identified on site **MHB01.**

Table 5: Anticipated Impact Rating

The status of the impact		
Status		**Description**
Positive:		a benefit to the holistic environment
Negative:		a cost to the holistic environment
Neutral:		no cost or benefit
The duration of the impact		
Score	Duration	Description
1	Short term	Immediate/ short term (less than 3 months)
2	Medium term	Construction or decommissioning period
3	Long term	For the life of the operation
5	Permanent	Permanent
The extent of the impact		
Score	Extent	Description
1	Footprint	Within the site boundary
2	Site	Affects immediate surrounding areas
3	Local	Local area / district (neighbouring properties, transport routes and adjacent towns) is affected
4	Regional	Extends to almost entire province or larger region
5	National	Affects the country.
The reversibility of the impact		
Score	Reversibility	Description
1	Completely reversible	Reverses with minimal rehabilitation & negligible residual affects
3	Reversible	Requires mitigation and rehabilitation to ensure reversibility
5	Irreversible	Cannot be rehabilitated completely/rehabilitation not viable
The magnitude (severe or beneficial) of the impact		
Score	Severe/beneficial effect	Description
1	Zero	Natural and/or social functions and/or processes remain unaltered.
2	Very Low	Natural and/or social functions and/or processes are negligibly altered.
3	Low	Natural and/or social functions and/or processes are slightly altered and are reversible with time.
4	Moderate	Natural and/or social functions and/or processes are notably altered and are reversible with rehabilitation.
5	High	Natural and/or social functions and/or processes are permanently altered.
The probability of the impact		
Score	Rating	Description
1	Unlikely	The chance of this impact occurring is zero (0%).
2	Possible	May occur. The chances of this impact occurring is defined as 25%.
3	Probable	Likely to occur. The chances of this impact occurring is defined as 50%.
4	Highly Probable	The chances of this impact occurring is defined as 75%.
5	Definite	Will certainly occur. The chance of this impact occurring is defined as 100%.
The Consequence		= Magnitude (3) + Extent (3) + Duration (3) + Reversibility (2).
The Significance		= Consequence x Probability. 11×4=44

Table 6: Key and guidance to impact rating

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

10 RECOMMENDATIONS AND CONCLUSIONS

At the request of Vahlengwe Mining Advisory and Consulting (Pty) Ltd on behalf of Saqondisana Investments (Pty) Ltd, Ruins Archaeo Heritage Consulting (Pty) Ltd conducted an Archaeological and Cultural Heritage Impact Assessment study for the proposed coal prospecting right application on the Farm Lotmga 8761 GT, Farm Kaisha 14719 GT, Farm Osaka 12977 GT, Farm Krompoort 2155 GT and Farm Ravine 9201 GT in the Magisterial District of Estcourt, KwaZulu-Natal Province. Desktop research revealed that the project area would have been rich in Iron Age artefacts and the field survey noted that this is not the case within the proposed development site. The developer should therefore be aware of the potential for chance finds, remains and the applicant and contractors are urged to lookout for chance finds during prospecting. The procedure for reporting chance finds has clearly been laid out and if this report is adopted by SAHRA/ KwaZulu-Natal Amafa and Research Institute, then there are no archaeological reasons why the proposed coal prospecting right application cannot be approved. Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of this heritage report, there are no significant cultural heritage resources barriers to the proposed development project. SAHRA/ KwaZulu-Natal Amafa and Research Institute may approve the project as planned with special commendations to implement the recommendations here in made:

1. It is recommended that SAHRA/ KwaZulu-Natal Amafa and Research Institute endorse the report as having satisfied the requirements of Section 38 (8) of the NHRA requirements;

2. It is recommended that SAHRA/ KwaZulu-Natal Amafa and Research Institute make a decision in terms of Section 38 (4) of the NHRA to approve the proposed coal prospecting right application;

3. The study area is littered with buildings and structures, however, no prospecting is to occur with the vicinity of these structures;

4. The study yielded archaeological finds in terms of stone tools and potsherds. The artefacts were documented, however, they were found on the surface hence out of context and therefore insignificant;

5. The identified burial sites within the study area should be protected from prospecting activities, therefore, a 100m buffer zone between the identified burial sites and prospecting activities must be maintained;

6. The possibility of chance finds is ever present within the study area and during the prospecting phase the developer is urged to be careful and heedful of that; and

7. From a heritage perspective supported by the findings of this study, the project is supported. However, prospecting activities should be approved under observation that the dimensions do not extend beyond the area considered in this report.

11 REFERENCES

Bizley, B and McKenzie, P. 2007. An Historical Meander through the Midlands of KwaZulu-Natal. Midlands Meander Association: Howick.

Bryant, A.T. 1965. Olden times in Zululand and Natal. Cape Town: C. Struik.

Clark, J.D. 1970. The Prehistory of Africa. London: Thames and Hudson.

Clarke, R.T. and Kuman, K. 2000.The Sterkfontein Paleontological and Archaeological sites. Johannesburg: University of the Witwatersrand.

Davies, O. 1974. Excavations at the Walled Early Iron Age site in Moor Park near Escourt, Natal Annals of the Natal Museum 22 (1): 289-323.

Deacon, H. J. and Deacon, J.1999. Human beginnings in South Africa: Uncovering the secrets of the Stone Age. Cape Town: David Philip

Esterhuysen, A and Smith, J. 2007. The archaeology of Mpumalanga. In: P. Delius (ed.), Mpumalanga History and Heritage: Recapturing the past, redefining the future. KwaZulu-Natal: University of KwaZulu-Natal, pp 7-21.

eThembeni Cultural Heritage. 2005. Heritage Impact Assessment of Bramhoek Integrated Power Supply Project, Northern KwaZulu-Natal, South Africa. Unpublished report prepared for PBA Integrated (SA) Engineers and Environmental Consultants.

Deacon, J.1984.Later Stone Age people and their descendants in southern Africa. In: Klein, R. (ed.) Southern African prehistory and palaeoenvironments: 221-328. Rotterdam: Balkema.

Derwent, S. 2006. KwaZulu-Natal Heritage Sites: A Guide to Some Great Places. Cape Town: David Phillips.

Huffman, T.N. 2007. Handbook to the Iron Age: The Archaeology of Pre-colonial Farming Societies in southern Africa. Pietermaritzburg: University of KwaZulu-Natal Press.

Lewis-Williams, J.D.1981. Believing and seeing: symbolic meanings in southern san rock paintings. Cambridge: Cambridge University Press.

Lombard, M., Wadley, L., Deacon, J., Wurz, S., Parsons, I., Mohapi, M., Swart, J and Mitchell, P. 2012. South African and Lesotho Stone Age Sequence Updated. The South African Archaeological Bulletin 67 (195): 123-144.

Maggs, T.M.O'C. 1980. Msuluzi confluence: a seventh century Early Iron Age site on the Tugela River. Annals of the Natal Museum 24 (1): 111-145.

Maggs, T.M. O'C.1984. Ndondondwane: a preliminary report on an Early Iron Age site on the lower Tugela River. Annals of the Natal Museum 26: 71-94.

Maggs, T.M.O'C.1989. The Iron Age farming communities. In Duminy, A. & Guest, B (eds.) Natal and Zululand from earlier times to 1910. A New History. Pietermaritzburg: University of Natal Press and Shuter and Shooter (Pvt), Ltd, pp 28-38.

Mazel, A. 1989. The Stone Age Peoples of Natal. In: Duminy, A & Guest, B (eds.). Natal and Zululand: From Earliest Times to 1910-A new History, pp 1-27. University of KwaZulu-Natal Press.

Mazel, A. 1989. People Making History: the last thousand years of hunter-gatherer communities in the Thukela Basin Natal Museum Journal of Humanities 1: 1-168.

Middleton, J. 1997. Encyclopedia of Africa south of the Sahara, volume 4. New York: Charles Scribner's' sons.

Mitchell, P. 2002. The Archaeology of Southern African. Cambridge: Cambridge University Press.

Nhundu, A. 2015. The effects of global warming on the rock art in the uKhahlamba-Drakensberg Park World Heritage Site, South Africa. In: Jurgen Runge (ed.) Changing Climates, Ecosystems within Arid southern Africa and Adjoining Regions: Palaeoecology of Africa volume 33.pp 191-202

Oberholster, J.J. 1972. The Historical monuments of South Africa. The Rembrandt Van Rijin Foundation for Culture. Cape Town.

Pelser, A.J. 2015. Phase 1 Heritage Impact Assessment report for the proposed Colenso power project near Colenso, KwaZulu-Natal. Unpublished report prepared for Eco-Partners.

Pelser, A.J. 2019. Phase 1 Heritage Impact Assessment report for the Natal-east prospecting project located on various farms of Estcourt in the province of KwaZulu-Natal. Unpublished report prepared for Shango Solutions.

Philipson, D. W. 1994. African Archaeology. Cambridge: Cambridge University Press.

Prins, F. 2015. Phase 1 Cultural Heritage Impact Assessment of proposed breaking of less than 100 ha of virgin land on portion 10 of the farm Kopleegte No. 1154 near Colenso in the Okhahlamba Local Municipality of uThukela District Municipality, KwaZulu-Natal. Unpublished report prepared for Nature Stamp.

Prins, F and Hall, S. 2013. Cultural Heritage Impact Assessment of the proposed Driefontein pipeline development, UMnambithi/Ladysmith Local Municipality, KwaZulu-Natal. Unpublished report prepared for Enviroedge.

Prins, F and Hall, S. 2015. First phase Cultural Heritage Impact Assessment of the proposed Rehabilitation of National Route 11 Section 2, UMnambithi-Ladysmith Local Municipality, KwaZulu-Natal. Unpublished report prepared for Sivest.

Rainsford, O. 1974. The Great Trek. Cordial: London.

Raper, P.E. 2004. Dictionary of southern African Place names. Cape Town: Jonathan Ball.

Ross, R, 2002. A concise history of South Africa. Cambridge: Cambridge University Press.

Seliane, M. 2008. Proposed upgrading of P263 and Bridge construction in Matiwane, Ladysmith Local Municipality. Phase 1 Heritage Impact Assessment. Unpublished report prepared for Henwood & Nxumalo Consulting Engineers.

Toth, N. & Schick, K. 2007.Handbook of Paleoanthropology. Berlin: Springer.

Villa, P., Sonano, S., Tsanova, T., Dengano, I., Higham, T. F. G., d´Erico, F., Blackwell, L., Lucejko, J. J., Colombini, M. P & Beaumont, P. B. 2012.National Academy of Sciences 109 (33): 13208-13213.

Volman, T.P. 1984. Early Prehistory of southern African. In: Klein, R.G (ed.). Southern African Prehistory and Palaeoenvironments. Rotterdam: A. A Balkema, pp 169-220.

Wan der Walt, J. 2017. Heritage Impact Assessment for the proposed Elandspruit Quarry, Ladysmith, KwaZulu-Natal. Unpublished report prepared for Green mined Environmental.

Wright, J. & Hamilton, C. 1989.Traditions and Transformations. The Phongolo-Mzimkhulu Region in the late Eighteenth and early Nineteenth Centuries. In: Duminy, A. & Guest, B (eds.) Natal and Zululand from earlier times to 1910. A New History. Pietermaritzburg: University of Natal Press and Shutter and Shooter (Pvt), Ltd, pp 49-82.

Legislation, Policy and Official documents

SAHRA, 2005. Minimum Standards for the Archaeological and Paleontological components of Impact Assessment Reports, Draft Version 1.4.

The National Heritage Resources Act 25 of 1999. South Africa: Government Gazette.

Internet Sources

https://www.battlefieldsroute.co.za>places>colenso

https://en.wikipedia.org>wiki>Battle-of-Colenso

https://www.kwazulu-natal-info.com>

www.sa.history.co.za//

12 APPENDIX 1: SITE SIGNIFICANCE

The following guidelines for determining site *significance* were developed by SAHRA in 2003. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

(a) Historic value

- Is it important in the community, or pattern of history?
- Does it have strong or special association with the life or work of a person, group or organization of importance in history?
- Does it have significance relating to the history of slavery?

(b) Aesthetic value

- Is it important in exhibiting particular aesthetic characteristics valued by a community or cultural group?

(c) Scientific value

- Does it have potential to yield information that will contribute to an understanding of natural or cultural heritage?
- Is it important in demonstrating a high degree of creative or technical achievement at a particular period?

(d) Social value

- Does it have strong or special association with a particular community or cultural group for social, cultural or spiritual reasons?

(e) Rarity

- Does it possess uncommon, rare or endangered aspects of natural or cultural heritage?

(f) Representivity

- Is it important in demonstrating the principal characteristics of a particular class of natural or cultural places or objects?
- What is the importance in demonstrating the principal characteristics of a range of landscapes or environments, the attributes of which identify it as being characteristic of its class?
- Is it important in demonstrating the principal characteristics of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province, region or locality?

Proposed Prospecting Right Application for Coal in Respect of Farm Lotmga 8761-GT, Farm Kaisha 14719-GT, Farm Osaka 12977-GT, Farm Krompoort 2155-GT and Farm Ravine 9201-GT in the Estcourt Magisterial District, KwaZulu-Natal Province

Alfred Duma Local Municipality, Uthukela District Municipality, KwaZulu-Natal Province

Farm: Lotmga 8761-GT, Farm Kaisha 14719-GT, Farm Osaka 12977-GT, Farm Krompoort 2155-GT and Farm Ravine 9201-GT

Fourie, H. Dr

Palaeontological Impact Assessment: Desktop Study

Facilitated by: Ruins Archaeo-Heritage Consulting

188 Pine Street,

Arcadia, Pretoria,

0083

Cell: 078 344 2671

2024/10/22

Ref: KZN 30/5/1/1/2/11694 PR

Plant fossil – Ecca Group

B. Executive summary

Outline of the development project: Ruins Archaeo-Heritage Consulting appointed Dr H. Fourie, a palaeontologist, to undertake a Palaeontological Impact Assessment (PIA), Desktop Study of the Proposed Prospecting Right Application for Coal in Respect of Farm Lotmga 8761-GT, Farm Kaisha 14719-GT, Farm Osaka 12977-GT, Farm Krompoort 2155-GT and Farm Ravine 9201-GT in the Estcourt Magisterial District, KwaZulu-Natal Province in the Alfred Duma Local Municipality, Uthukela District Municipality, KwaZulu-Natal Province.

The applicant, Saqondisana Investment (Pty) Ltd intends to prospect for coal with invasive methods on 0.305 ha and proposes to drill 20 boreholes to determine the mineral deposition, quantity, economic viability, and possibilities of the project leading to a viable mine.

The Project includes one locality Option (see Figure 2):
Option 1: An area outlined in red, 36.63 km east of Ladysmith, 29.60 km southeast of Umbulwana Village on the R74 Road, Colenso is west and the Tugela Estates are east. The approximate size of the property is 2718.14 ha.

Legal requirements:-

The **National Heritage Resources Act (Act No. 25 of 1999) (NHRA)** requires that all heritage resources, that is, all places or objects of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance are protected. The Republic of South Africa (RSA) has a remarkably rich fossil record that stretches back in time for some 3.5 billion years and must be protected for its scientific value. Fossil heritage of national and international significance is found within all provinces of the RSA. South Africa's unique and non-renewable palaeontological heritage is protected in terms of the National Heritage Resources Act. According to this act, palaeontological resources may not be excavated, damaged, destroyed or otherwise impacted by any development without prior assessment and without a permit from the relevant heritage resources authority.

The main aim of the assessment process is to document resources in the development area and identify both the negative and positive impacts that the development brings to the receiving environment. The PIA therefore identifies palaeontological resources in the area to be developed and makes recommendations for protection or mitigation of these resources.

"palaeontological" means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or traces.

For this study, resources such as geological maps, scientific literature, institutional fossil collections, satellite images, aerial maps and topographical maps were used. It provides an assessment of the observed or inferred palaeontological heritage within the study area, with recommendations (if any) for further specialist palaeontological input where this is considered necessary.

A Palaeontological Impact Assessment is generally warranted where rock units of **LOW** to **VERY HIGH** palaeontological sensitivity are concerned, levels of bedrock exposure within the study area are adequate; large scale projects with high potential heritage impact are planned; and where the distribution and nature of fossil remains in the proposed area is unknown. The specialist will inform whether further monitoring and mitigation are necessary.

Types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (Act No.25 of 1999):
(i) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens.

This report adheres to the guidelines of Section 38 (1) of the National Heritage Resources Act (Act No. 25 of 1999). Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length; (b) the construction of a bridge or similar structure exceeding 50 m in length; (c) any development or other activity which will change the character of a site (see Section 38); (d) the re-zoning of a site exceeding 10 000 m² (1 ha) in extent; (e) or any other category of development provided for in regulations by SAHRA or a PHRA authority.

This report (Appendix 6, **1c)** aims to provide comment and recommendations on the potential impacts that the proposed development could have on the fossil heritage of the area and to state if any mitigation or conservation measures are necessary.

Outline of the geology and the palaeontology:

The geology was obtained from map 1:100 000, Geology of the Republic of South Africa (Visser 1984) and 2830 Dundee (Wolmarans and Linstrőm 1988), 1:250 000 geological maps.

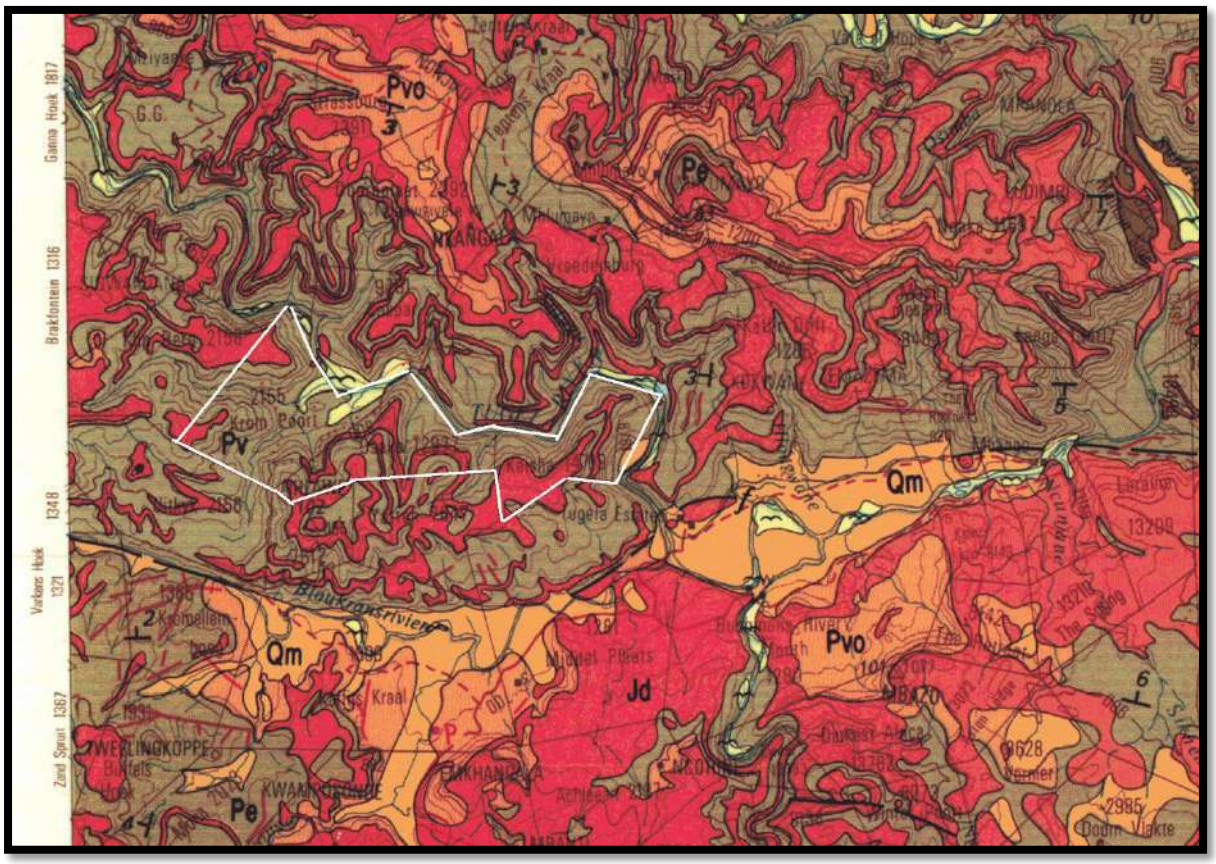

Figure: The geology of the development area.

Legend to Figure and short explanation.

M – Alluvium (yellow). Quaternary.

Jd – Dolerite (pink). Jurassic.

Pv – Sandstone, shale and grit with coal and oil-shale beds (brown). Vryheid Formation, Ecca Group, Karoo Supergroup. Permian.

…… – (black) Lineament (Possible dyke).

--f— Fault.

⊥5˚ - Strike and dip.

□ – Approximate position of prospecting (blocked in white).
The Vryheid Formation is named after the type area of Vryheid-Volksrust. In the north-eastern part of the Karoo basin the Vryheid Formation thins and eventually wedges out towards the south, southwest and west with increasing distance from its source area to the east and northeast (Johnson 2009). The Vryheid Formation consists essentially of sandstone, shale, and subordinate coal beds, and has a maximum total thickness of 500 m. It forms part of the Middle Ecca (Kent 1980). This formation has the largest coal reserves in South Africa. The pro-delta sediments are characterised by trace and plants fossils (Snyman 1996).

Palaeontology – Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, the palaeontological sensitivity can generally be ranked from **VERY LOW** to **VERY HIGH**, and here locally in the development area **VERY HIGH** for the Vryheid Formation (SG 2.2 SAHRA APMHOB, 2012).

The Ecca Group, Vryheid Formation (Pv) may contain fossils of diverse non-marine trace, *Glossopteris* flora, mesosaurid reptiles, palaeoniscid fish, marine invertebrates, insects, and crustaceans (Johnson 2009). *Glossopteris* trees rapidly colonised the large deltas along the northern margin of the Karoo Sea. Dead vegetation accumulated faster than it could decay, and thick accumulations of peat formed, which were ultimately converted to coal. It is only in the northern part of the Karoo Basin that the glossopterids and cordaitales, ferns, clubmosses and horsetails thrived (McCarthy and Rubidge 2005).

Summary of findings (**1d**): The Desktop Study was undertaken in October 2024 in dry and mild conditions. As this is a desktop study the season (vegetation) and time (shadows) have no influence, and the following is reported:

The Project includes one locality Option present on the Karoo Supergroup.

Recommendation:

Concerns/threats **(1k,l,m)** to be added to EMPr:

1. Threats are earth moving equipment/machinery (for example haul trucks, front end loaders, excavators, graders, dozers) during construction, the sealing-in, disturbance, damage or destruction of the fossils by development, vehicle traffic, prospecting, mining and human disturbance.
2. Special care must be taken during the digging, drilling, and excavating of foundations, trenches, channels and footings and removal of overburden not to intrude fossiliferous layers.

The recommendations are **(1g)**:

1. The potential impact of the development on fossil heritage is **VERY HIGH** and therefore a field survey is necessary for this development (according to SAHRA protocol) if fossils are found. A Phase 1 Palaeontological Impact Assessment: Field Study will be recommended if fossils are found during the development.
2. Mitigation/Phase 1 will be needed if fossils are found during the development.
3. No consultation with parties was necessary. The Environmental Control Officer must familiarise him- or herself with the formations present and its fossils and follow protocol.
4. The development may go ahead with caution due to the presence of the Vryheid Formation shale.
5. The ECO must survey for fossils before and or after clearing, ground-breaking, drilling or excavating.

6. The EMPr will cover the conservation of heritage and palaeontological material that may be exposed during construction activities. For a chance fossil find, the protocol is to immediately cease all construction activities, construct a 30 m no-go barrier, and contact SAHRA for further investigation.

   Stakeholders: Applicant – Saqondisana Investment (Pty) Ltd. Plot 1AH, Sapfo Valtaki, Gauteng, 1020. Tel: 082 461 3787.
   Environmental – Archaeo-Heritage Consulting. 188 Pine Street, Arcadia, Pretoria, 0083. Tel: 0.
   Landowner – Several.

C. Table of Contents

D. Background information on the project

Report

This report is part of the environmental impact assessment process under the National Environmental Management Act, as amended (Act No. 107 of 1998) (NEMA) and includes Appendix 6 (GN R326 of 7 April 2017) of the Environmental Impact Assessment Regulations (see Appendix 2). It also is in compliance with The Minimum Standards for Palaeontological Components of Heritage Impact Assessment Reports, SAHRA, APMHOB, Guidelines 2012, Pg 1-15 **(2)**.

Outline of development

This report discusses and aims to provide the developer with information regarding the location of palaeontological material that will be impacted by the development. In the pre-construction phase it may be necessary for the developer to apply for the relevant permit from the South African Heritage Resources Agency depending on the presence of fossils (SAHRA / PHRA).

The applicant, Saqondisana Investment (Pty) Ltd intends to prospect for coal with invasive methods on 0.305 ha and proposes to drill 20 boreholes to determine the mineral deposition, quantity, economic viability, and possibilities of the project leading to a viable mine.

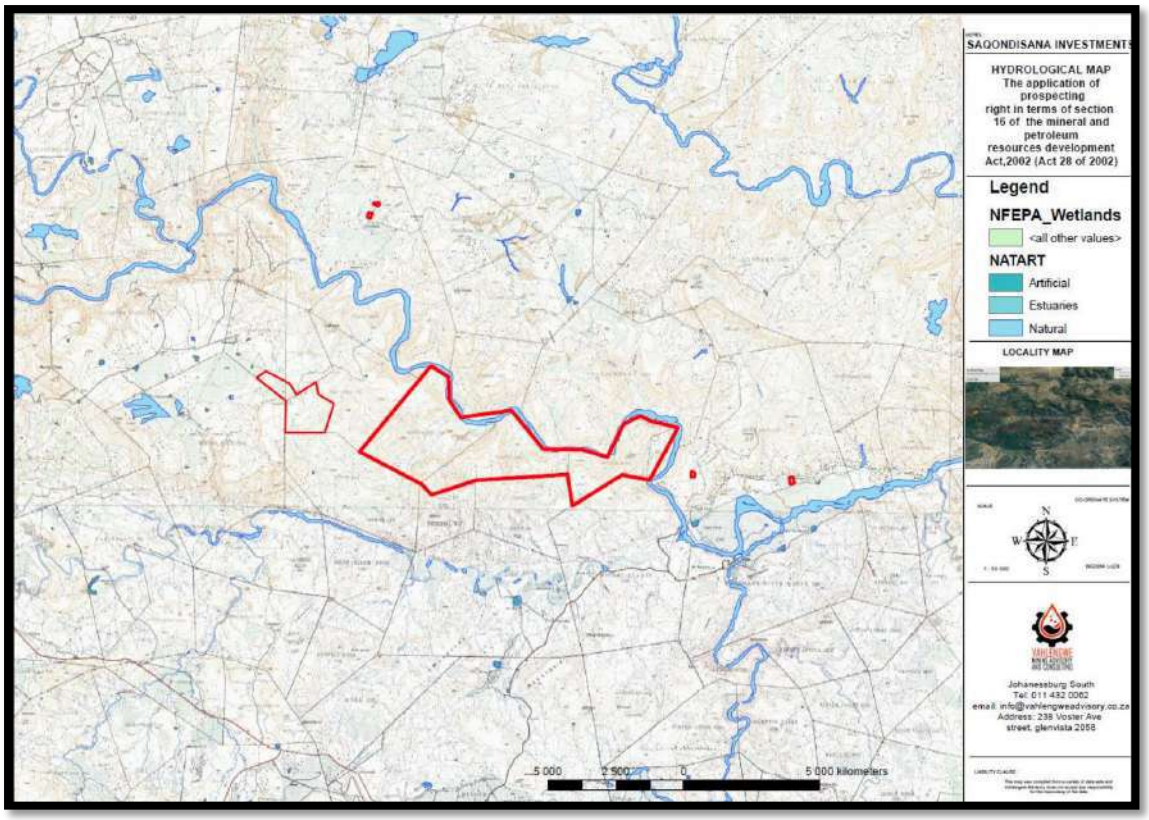

Figure 1: Topographical map of project location (Archaeo-).

Related Infrastructure:

1. Vegetation clearance
2. Installation of mobile offices and ablutions
3. Temporary access roads
4. Drilling, and
5. Rehabilitation.

The Project includes one locality Option (see Figure 2):
Option 1: An area outlined in red, 36.63 km east of Ladysmith, 29.60 km southeast of Umbulwana Village on the R74 Road, Colenso is west and the Tugela Estates are east. The approximate size of the property is 2718.14 ha.

Rezoning/ and or subdivision of land: No.
Name of Developer and Consultant: Saqondisana Investment (Pty) Ltd and Archaeo-Heritage Consulting.
Terms of reference: Dr H. Fourie is a palaeontologist commissioned to do a palaeontological impact assessment: field study to ascertain if any palaeontological sensitive material is present in the development area. This study will advise on the impact on fossil heritage mitigation or conservation necessary, if any.
Short *Curriculum vitae* ***(1ai,aii)***: Dr Fourie obtained a Ph.D from the Bernard Price Institute for Palaeontological Research (now ESI), University of the Witwatersrand. Her undergraduate degree is in Geology and Zoology. She specialises in vertebrate morphology and function concentrating on the Therapsid Therocephalia. She has published seven papers in mostly scientifically accredited journals and has been conducting impact assessments since 2012 covering developments such as powerlines, solar plants, wind turbine plants, dams, rehabilitations, mine projects, roads, townships, bridges, refuse dumps, water and sanitation works; and farming expansions. At present she is curator of a large fossil invertebrate collection, Therapsids, dinosaurs, amphibia, fish, reptiles, and

plants at Ditsong: National Museum of Natural History. For the past 18 years she carried out field work in the North West, Western Cape, Northern Cape, Eastern Cape, Limpopo, KwaZulu-Natal, Mpumalanga, Gauteng and Free State Provinces. Dr Fourie has been employed at the Ditsong: National Museum of Natural History in Pretoria (formerly Transvaal Museum) for 30 years.
Legislative requirements: South African Heritage Resources Agency (SAHRA) for issue of permits if necessary. National Heritage Resources Act (Act No. 25 of 1999). An electronic copy of this report must be supplied to SAHRA.

E. Description of property or affected environment
Location and depth:
The Proposed Prospecting Right Application for Coal in Respect of Farm Lotmga 8761-GT, Farm Kaisha 14719-GT, Farm Osaka 12977-GT, Farm Krompoort 2155-GT and Farm Ravine 9201-GT will be situated in the Estcourt Magisterial District, KwaZulu-Natal Province in the Alfred Duma Local Municipality, Uthukela District Municipality, KwaZulu-Natal Province.

Depth is determined by the related infrastructure to be developed and the thickness of the formation in the development area as well as depth of the foundations, footings and channels to be developed. Details of the location and distribution of all significant fossil sites or key fossiliferous rock units are often difficult to determine due to thick topsoil, subsoil, overburden and alluvium. Depth of the overburden may vary a lot. Geological maps do not provide depth or superficial cover, it only provides mappable surface outcrops. The depth can be verified with test pit results or drill cores. The depth of the Vryheid Formation is 120 m deep.

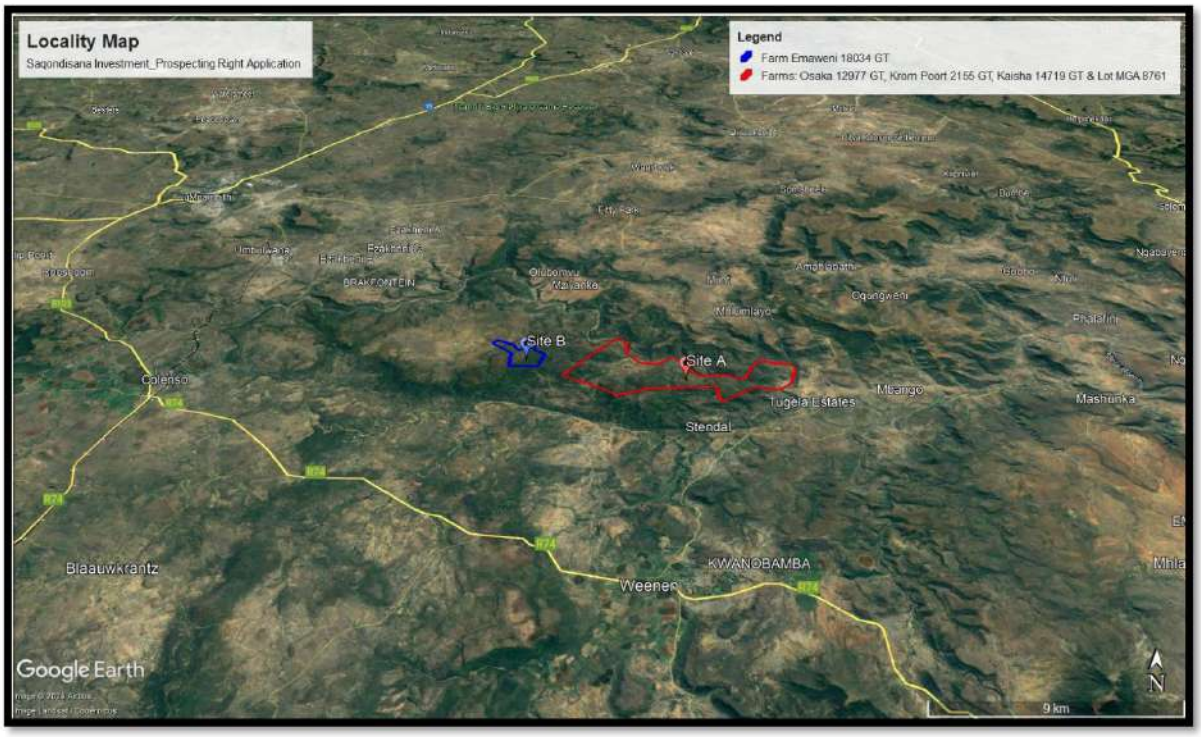

Figure 2: Google Earth image showing development, Site A in red (Archaeo-).

F. Description of the Geological Setting
Description of the rock units:
Large areas of the southern African continent are covered by the Karoo Supergroup (Figure 3). It covers older geological formations with an almost horizontal blanket. Several basins are present with the main basin in the central part of south Africa and several smaller basins towards Lebombo, Springbok Flats and Soutpansberg. An

estimated age is 150 – 180 Ma. And a maximum thickness of 7000 m is reached in the south. Three formations overlie the Beaufort Group, they are the Molteno, Elliot and Clarens Formations. The Elliot Formation is also known as the Red Beds and the old Cave Sandstone is known as the Clarens Formation. At the top is the Drakensberg Basalt Formation with its pillow lavas, pyroclasts, etc. (Kent 1980, Snyman 1996). The Beaufort Group is underlain by the Ecca Group which lies on the Dwyka Group.

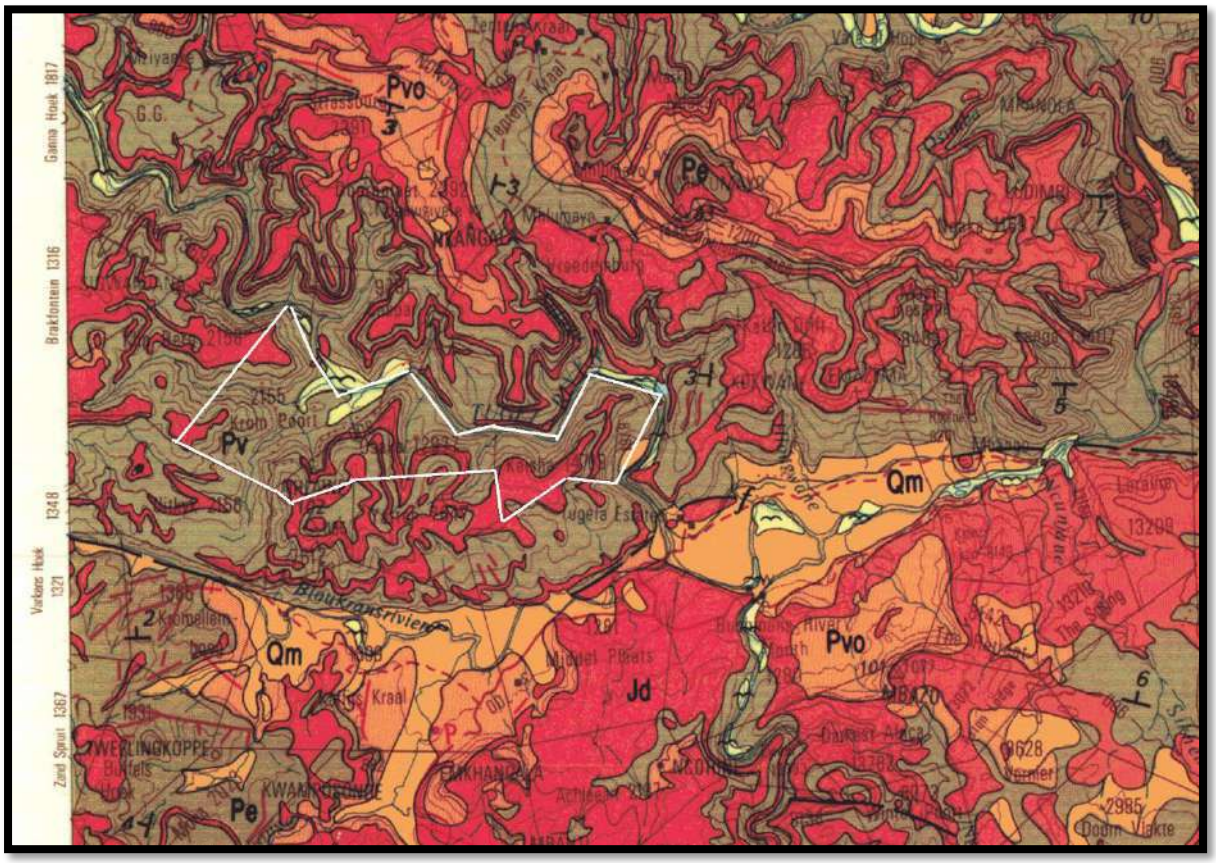

Figure 3: Geology of the development area **(1h)**.
Legend to Figure and short explanation.
M – Alluvium (yellow). Quaternary.
Jd – Dolerite (pink). Jurassic.
Pv – Sandstone, shale and grit with coal and oil-shale beds (brown). Vryheid Formation, Ecca Group, Karoo Supergroup. Permian.
…… – (black) Lineament (Possible dyke).
--f— Fault.
⊥5˚ - Strike and dip.
□ – Approximate position of prospecting (blocked in white).

Mining Activities on Figure:
None.
Mining past and present has no influence on the project.

The Ecca Group is early to mid-Permian (545-250 Ma) in age. Sediments of the Ecca group are lacustrine and marine to fluvio-deltaic (Snyman 1996). The Ecca group is known for its coal (mainly the Vryheid Formation) (five coal seams) and uranium. Coalfields formed due to the accumulation of plant material in shallow and large swampy deltas (see Appendix 1). The Ecca Group conformably overlies the Dwyka Group and is conformably overlain by

the Beaufort Group, Karoo Supergroup. It consists essentially of mudrock (shale), but sandstone-rich units occur towards the margins of the present main Karoo basin in the south, west and north-east, with coal seams also being present in the north-east (Kent 1980, Johnson 2009).

The Vryheid Formation is named after the type area of Vryheid-Volksrust. In the north-eastern part of the Karoo basin the Vryheid Formation thins and eventually wedges out towards the south, southwest and west with increasing distance from its source area to the east and northeast (Johnson 2009). The Vryheid Formation consists essentially of sandstone, shale, and subordinate coal beds, and has a maximum total thickness of 500 m. It forms part of the Middle Ecca (Kent 1980). This formation has the largest coal reserves in South Africa. The pro-delta sediments are characterised by trace and plants fossils (Snyman 1996).

Ecca rocks are stable and lend themselves well to developments. It is only unstable in or directly above mining activities (Snyman 1996). Dolerite dykes occur throughout the Karoo Supergroup. Structural geological features such as dykes and faults can have a measurable influence on ground water flow and mass transport. The Vryheid Formation sediments may attain a thickness of 120 – 140 m. A typical profile includes soil and clay, sandstone and siltstone, shale, 2 upper seam, shale, 2 seam, sandstone, no 1 seam, shale and dolomite at the bottom. The typical colours for the Vryheid Formation are grey and yellow for the sediments and black for the coal seam. The thickness of the grey shale can vary and this is interlayered with the also variable yellow sandstone and coal seams.

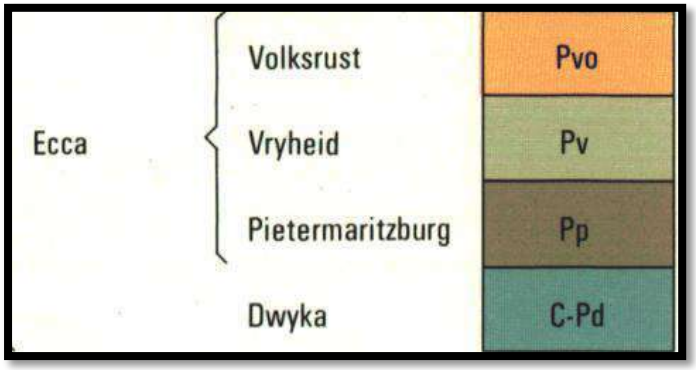

Figure 4: Lithostratigraphic column of the development area (2730 Vryheid).

It is recommended to wait for the response from SAHRA on the Phase 1: Field Study (this report). SAHRA protocol must be followed.

G. Background to Palaeontology of the area

Summary: When rock units of moderate to very high palaeontological sensitivity are present within the development footprint, a desk top and or field scoping (survey) study by a professional palaeontologist is usually warranted. The main purpose of a field scoping (survey) study would be to identify any areas within the development footprint where specialist palaeontological mitigation during the construction phase may be required (SG 2.2 SAHRA AMPHOB, 2012).

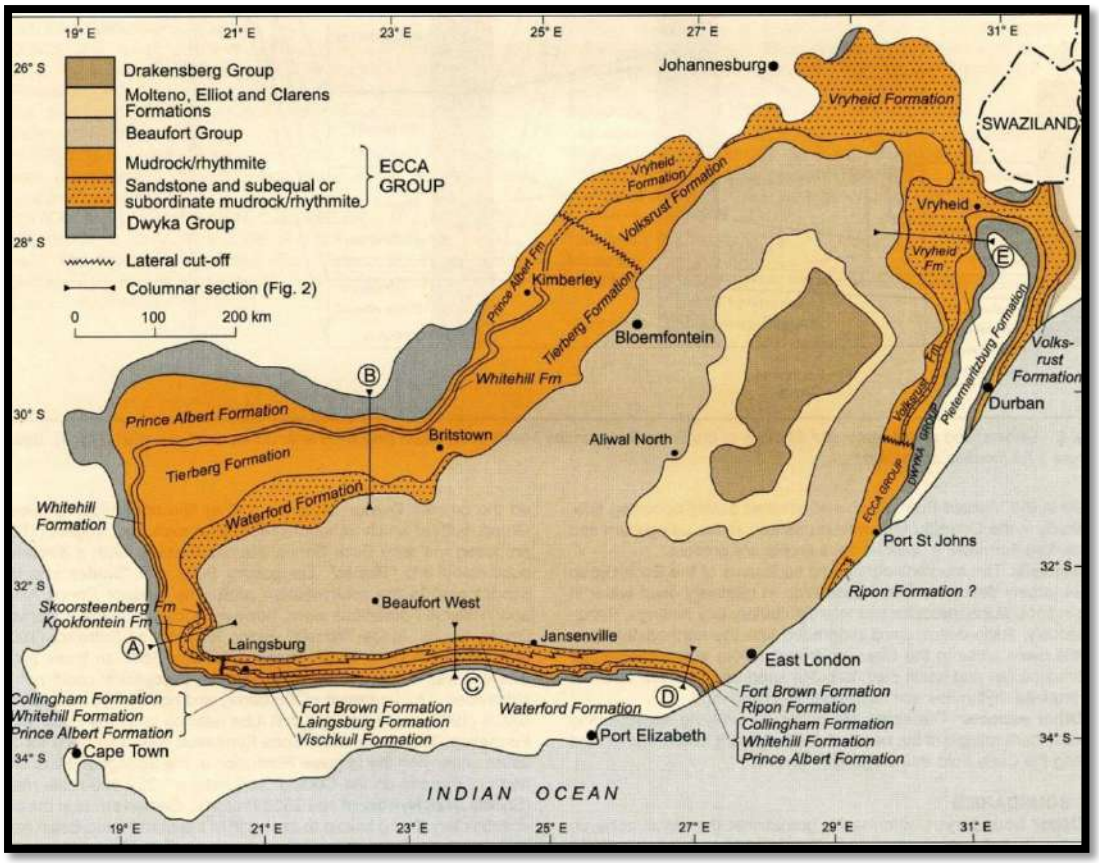

Figure 5: Extent of the Karoo Supergroup (Johnson 2009).

The Ecca Group, Vryheid Formation (Figure 5) may contain fossils of diverse non-marine trace, *Glossopteris* flora, mesosaurid reptiles, palaeoniscid fish, marine invertebrates, insects, and crustaceans (Johnson 2009). *Glossopteris* trees rapidly colonised the large deltas along the northern margin of the Karoo Sea. Dead vegetation accumulated faster than it could decay, and thick accumulations of peat formed, which were ultimately converted to coal. It is only in the northern part of the Karoo Basin that the glossopterids and cordaitales, ferns, clubmosses and horsetails thrived (McCarthy and Rubidge 2005).

The Glossopteris flora is thought to have been the major contributor to the coal beds of the Ecca. These are found in Karoo-age rocks across Africa, South America, Antarctica, Australia and India. This was one of the early clues to the theory of a former unified Gondwana landmass (Norman and Whitfield 2006).

Rocks of Permian age in South Africa are particularly rich in fossil plants (Rayner and Coventry 1985). The fossils are present in the grey shale interlayered with the coal seams. The fossils are not very rare and occur also in other parts of the Karoo stratigraphy. It is often difficult to spot the greyish fossils as they are the same colour as the grey shale in which they are present as these coalified compressions have been weathered to leave surface replicas on the enclosing shale matrix. The pollen of the Greenside Colliery near Witbank also on the Vryheid Formation was the focus of a Ph.D study. A locality close to Ermelo, also Vryheid Formation, has yielded *Scutum, Glossopteris* leaves, *Neoggerathiopsis* leaves, the lycopod *Cyclodendron leslii,* and various seeds and scale leaves (Prevec 2011).

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, the palaeontological sensitivity is generally ranked from **VERY LOW** to **VERY HIGH**.

Table 1: Taken from Palaeotechnical Report (Groenewald 2012) (**1cA)**.

Vryheid (Pv)		Light grey coarse- to fine-grained sandstone and siltstone. Dark coloured siltstone due to presence of carbon enrichment and coal beds	Abundant plant fossils of *Glossopteris* and other plants. Trace fossils. The reptile *Mesosaurus* has been found in the southern part of the Karoo Basin

Table 2: Criteria used (Fossil Heritage Layer Browser/SAHRA) **(1cB)**:

Rock Unit	Significance/vulnerability	Recommended Action
Quaternary	Low	Desktop study required
Dolerite	Very Low	No action required
Vryheid Formation	Very High	Field assessment and protocol for finds is required

Databases and collections: Ditsong: National Museum of Natural History. Evolutionary Studies Institute, University of the Witwatersrand (ESI).
Impact: **VERY HIGH** for the Vryheid Formation, Karoo Supergroup. There are significant fossil resources that may be impacted by the development (mudstone, shale) and if destroyed are no longer available for scientific research or other public good (Almond, *et al.* 2009).

The Project includes one locality Option (see Figure 2) (**1f,j)** The palaeontological sensitivity is as stated above.
Option 1: An area outlined in red, 36.63 km east of Ladysmith, 29.60 km southeast of Umbulwana Village on the R74 Road, Colenso is west and the Tugela Estates are east. The approximate size of the property is 2718.14 ha.

All the land involved in the development was assessed **(ni,nii)** and none of the property is unsuitable for development (see Recommendation B).

H. Description of the Methodology (1e)
The palaeontological impact assessment desktop study was undertaken in October 2024. A Phase 1: Field Survey of the affected portion includes photographs (in 7.1 mega pixels) taken of the site with a digital camera (Canon PowerShot A470). Additionally, Google Maps will be accessed on a cellular phone/tablet for navigation. A Global Positioning System (GPS) (Garmin eTrex 10) is used to record fossiliferous finds and outcrops (bedrock) when the area is not covered with topsoil, subsoil, overburden, vegetation, grassland, trees or waste. The survey did identify the Karoo Supergroup. A literature survey is included and the study relied heavily on geological maps.

SAHRA document 7/6/9/2/1 (SAHRA 2012) requires track records/logs from archaeologists not palaeontologists as palaeontologists concentrate on outcrops which may be recorded with a GPS. Isolated occurrences of rocks usually do not constitute an outcrop. Fossils can occur in dongas, as nodules, in fresh rock exposures, and in riverbeds. Finding fossils require the experience and technical knowledge of the professional palaeontologist, but that does not mean that an amateur can't find fossils. The geology of the region is used to predict what type of fossil and zone will be found in any particular region. Archaeozoologists concentrate on more recent fossils in the quaternary and tertiary deposits.

Assumptions and Limitations (**1i**):-
The accuracy and reliability of the report **may be** limited by the following constraints:

1. Most development areas have never been surveyed by a palaeontologist or geophysicist.
2. Variable accuracy of geological maps and associated information.

3. Poor locality information on sheet explanations for geological maps.
4. Lack of published data.
5. Lack of rocky outcrops.
6. Inaccessibility of site – not done.
7. Insufficient data from developer and exact lay-out plan for all structures - sufficient.

A Phase 2 Palaeontological Impact Assessment: Mitigation will include:

1. Recommendations for the future of the site.
2. Description of work done (including number of people and their responsibilities).
3. A written assessment of the work done, fossils excavated, not removed or collected and observed.
4. Conclusion reached regarding the fossil material.
5. A detailed site plan.
6. Possible declaration as a heritage site or Site Management Plan.

The National Heritage Resources Act No. 25 of 1999 further prescribes.

Act No. 25 of 1999. National Heritage Resources Act, 1999.
National Estate: 3 (2) (f) archaeological and palaeontological sites,
(i)(1) objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens,
Heritage assessment criteria and grading: (a) Grade 1: Heritage resources with qualities so exceptional that they are of special national significance;
(b) Grade 2: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and (c) Grade 3: Other heritage resources worthy of conservation.
SAHRA is responsible for the identification and management of Grade 1 heritage resources.
Provincial Heritage Resources Authority (PHRA) identifies and manages Grade 2 heritage resources.
Local authorities identify and manage Grade 3 heritage resources.

No person may damage, deface, excavate, alter, remove from its original position, subdivide or change the planning status of a provincially protected place or object without a permit issued by a heritage resources authority or local authority responsible for the provincial protection.
Archaeology, palaeontology and meteorites: Section 35.
(2) Subject to the provisions of subsection (8) (a), all archaeological objects, palaeontological material and meteorites are the property of the State.
(3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.

Mitigation involves planning the protection of significant fossil sites, rock units or other palaeontological resources and/or excavation, recording and sampling of fossil heritage that might be lost during development, together with pertinent geological data. The mitigation may take place before and / or during the construction phase of development. The specialist will require a Phase 2 mitigation permit from the relevant Heritage Resources Authority before a Phase 2 may be implemented.

The Mitigation is done in order to rescue representative fossil material from the study area to allow and record the nature of each locality and establish its age before it is destroyed and to make samples accessible for future

research. It also interprets the evidence recovered to allow for education of the public and promotion of palaeontological heritage.

Should further fossil material be discovered during the course of the development (*e. g.* during bedrock excavations), this must be safeguarded, where feasible *in situ,* and reported to a palaeontologist or to the Heritage Resources authority. In situations where the area is considered palaeontologically sensitive (*e. g.* Karoo Supergroup Formations, ancient marine deposits in the interior or along the coast) the palaeontologist might need to monitor all newly excavated bedrock. The developer needs to give the palaeontologist sufficient time to assess and document the finds and, if necessary, to rescue a representative sample.

When a Phase 2 palaeontological impact study is recommended, permission for the development to proceed can be given only once the heritage resources authority has received and approved a Phase 2 report and is satisfied that (a) the palaeontological resources under threat have been adequately recorded and sampled, and (b) adequate development on fossil heritage, including, where necessary, *in situ* conservation of heritage of high significance. Careful planning, including early consultation with a palaeontologist and heritage management authorities, can minimise the impact of palaeontological surveys on development projects by selecting options that cause the least amount of inconvenience and delay.

Three types of permits are available; Mitigation, Destruction and Interpretation. The specialist will apply for the permit at the beginning of the process (SAHRA 2012).

I. Description of significant fossil occurrences

All Karoo Supergroup geological formations are ranked as **VERY LOW** to **VERY HIGH**, and here the impact is potentially **VERY HIGH** for the Vryheid Formation and **LOW** for the Quaternary.

Fossils likely to be found are mostly plants (Appendix 1) such as '*Glossopteris* flora' of the Vryheid Formation. The aquatic reptile *Mesosaurus* and fossil fish may also occur with marine invertebrates, arthropods and insects. Trace fossils can also be present. During storms a great variety of leaves, fructifications and twigs accumulated and because they were sandwiched between thin films of mud, they were preserved to bear record of the wealth and the density of the vegetation around the pools. They make it possible to reconstruct the plant life in these areas and wherever they are found, they constitute most valuable palaeobotanical records (Plumstead 1963) and can be used in palaeoenvironmental reconstructions (Appendix 1).

Details of the location and distribution of all significant fossil sites or key fossiliferous rock units are often difficult to be determined due to thick topsoil, subsoil, overburden and alluvium. Depth of the overburden may vary a lot.

The threats are:-

- Earth moving equipment/machinery (front end loaders, excavators, graders, dozers) during construction or prospecting,
- The sealing-in or destruction of fossils by development, vehicle traffic, and human disturbance. See Description of the Geological Setting (F) above.

J. Recommendation

a. There is no objection (see Recommendation B) to the development, it will be necessary to request a Phase 1 Palaeontological Impact Assessment: Field Study to determine whether the development will affect fossiliferous outcrops or if fossils are found as the palaeontological sensitivity of the area is **VERY HIGH**.
b. Preferred choice: Only one Option is presented and possible.

c. The following should be conserved: if any palaeontological material is exposed during clearing, digging, excavating, or drilling SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed and a palaeontologist should be called in to determine proper mitigation measures.
d. This report must be submitted to SAHRA/PHRA together with the Heritage Impact Assessment Report.

Sampling and collecting:
Wherefore a permit is needed from the South African Heritage Resources Agency (SAHRA / PHRA).

a. Objections: Cautious. See heritage value and recommendation.
b. Conditions of development: See Recommendation.
c. Areas that may need a permit: If fossils are found.
d. Permits for mitigation: Only needed from SAHRA/PHRA prior to Mitigation.

K. Conclusions

a. All the land involved in the development was assessed and none of the property is unsuitable for development (see Recommendation B).
b. All information needed for the Palaeontological Impact Assessment was provided by the Consultant. All technical information was provided by Archaeo-Heritage Consulting.
c. Areas that would involve mitigation and may need a permit from the South African Heritage Resources Agency are discussed.
d. The following should be conserved: if any palaeontological material is exposed during clearing, digging, excavating, or drilling, SAHRA must be notified. All development activities must be stopped, a 30 m barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures.
e. Consultation with parties was not necessary **(1o,p,q).**
f. This project may benefit the community, will create short- and long-term employment, the life expectancy of the community, the growth of the community, and social development in general.
g. Condition in which development may proceed: It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant contractors to protect the environment (fossils) and adjacent areas as well as for safety and security reasons.

L. Bibliography

ALMOND, J., PETHER, J, and GROENEWALD, G. 2013. South African National Fossil Sensitivity Map. SAHRA and Council for Geosciences.

CLUVER, M.A. 1978. *Fossil Reptiles of the South African Karoo.* South African Museum, Cape Town, Pp 1-54.

GRODNER, M. and CAIRNCROSS, B. 2003. A regional scale 3-D model of the Witbank Coalfield, Northern Karoo Basin, South Africa. *South African Journal of Geology,* **106(4):** 249-264.

GROENEWALD, G.H. 2012. Palaeotechnical Report for KwaZulu-Natal Province, South African Heritage Resources Agency, AMAFA, Pp 23.

JOHNSON, M.R. 2009. Ecca Group. Karoo Supergroup. Catalogue of South African Lithostratigraphic Units. SACS, **10:** 5-7.

KENT, L. E., 1980. Part 1: Lithostratigraphy of the Republic of South Africa, South West Africa/Namibia and the Republics of Bophuthatswana, Transkei and Venda. SACS, Council for Geosciences, *Stratigraphy of South Africa. 1980. South African Committee for Stratigraphy*. Handbook 8, Part 1, pp 690.

KITCHING, J.W. 1977. The distribution of the Karroo Vertebrate Fauna, Memoir 1. Bernard Price Institute for Palaeontological Research (now ESI), University of the Witwatersrand, Pp 1-131.

MCCARTHY, T and RUBIDGE, B. 2005. *The Story of Earth Life: A southern African perspective on a 4.6-billion-year journey.* Struik. Pp 333.

NORMAN, N. 2013. *Geology off the beaten track: exploring South Africa's hidden treasures.* De Beers, Struik, Pp 1-256.

NORMAN, N. and WHITFIELD, G., 2006. *Geological Journeys.* De Beers, Struik, Pp 1-320.

PLUMSTEAD, E.P. 1963. The influence of plants and environment on the developing animal life of Karoo times. *South African Journal of Science,* **59(5):** 147-152.

PREVEC, R. 2011. A structural re-interpretation and revision of the type material of the glossopterid ovuliferous fructification *Scutum* from South Africa. *Palaeontologia africana,* **46:** 1-19.

RAYNER, R.J. and COVENTRY, M.K. 1985. A *Glossopteris* flora from the Permian of South Africa. *South African Journal of Science,* **81:** 21-32.

ROBERTS, D.L. and BRANDL, G. 2006. *Geology of South Africa:* 22. Sedimentary Rocks of the Karoo Supergroup, Pp 1-461.

RUBIDGE, B. S. (ed.), 1995. Biostratigraphy of the Beaufort Group (Karoo Supergroup). South African Committee for Biostratigraphy, Biostratigraphic Series No. 1, 46pp. Council for Geoscience, Pretoria.

SAHRA 2012. Compliance to SAHRA Minimum Standards for Phase 1 Archaeological Impact Assessments. Document 7/6/9/2/1. Pp 2.

SG 2.2 SAHRA APMHOB Guidelines, 2012. Minimum standards for palaeontological components of Heritage Impact Assessment Reports, Pp 1-15.

SNYMAN, C. P., 1996. *Geologie vir Suid-Afrika*. Departement Geologie, Universiteit van Pretoria, Pretoria, Volume 1, Pp. 513.

VAN DER WALT, M., DAY, M., RUBIDGE, B. S., COOPER, A. K. & NETTERBERG, I., 2010. Utilising GIS technology to create a biozone map for the Beaufort Group (Karoo Supergroup) of South Africa. *Palaeontologia Africana,* **45:** 1-5.

VISSER, D.J.L. (ed) 1984. Geological Map of South Africa 1:100 000. South African Committee for Stratigraphy. Council for Geoscience, Pretoria.

VISSER, D.J.L. (ed) 1989. *Toeligting: Geologiese kaart (1:100 000). Die Geologie van die Republieke van Suid Afrika, Transkei, Bophuthatswana, Venda, Ciskei en die Koningkryke van Lesotho en Swaziland*. South African Committee for Stratigraphy. Council for Geoscience, Pretoria.

VISSER, H.N., SPIES, J.J., FOURIE, G.P., VILJOEN, J.J., SőHGNE, A.P.G. and VENTER, F.A. 1961. Die geologie van die gebied tussen Middelburg en Cullinan, Transvaal. Toeligting van blad 2528D (Bronkhorstspruit) en blad 2529C (Witbank). Geologies Opname, Pp 1-69.

WOLMARANS, L.G. and LINSTRőM, W. 1988. 1:250 000 Geological Map 2830 Dundee. South African Committee for Stratigraphy, Council for Geoscience, Pretoria.

Declaration (1b)

I, Heidi Fourie, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed development project for which I was appointed to do a palaeontological assessment. There are no circumstances that compromise the objectivity of me performing such work.

I accept no liability, and the client, by receiving this document, indemnifies me against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the use of the information contained in this document.

It may be possible that the Impact Assessment may have missed palaeontological resources in the project area as outcrops are not always present or visible while others may lie below the overburden of earth and may only be present once development commences.

This report may not be altered in any way and any parts drawn from this report must make reference to this report.

POPI Act 2013 Statement

It provides that everyone has the right to privacy and includes a right to protection against the unlawful collection, retention dissemination and use of personal information contained in this document and pertains to the phone and contact details, signature and contents.

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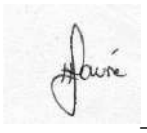
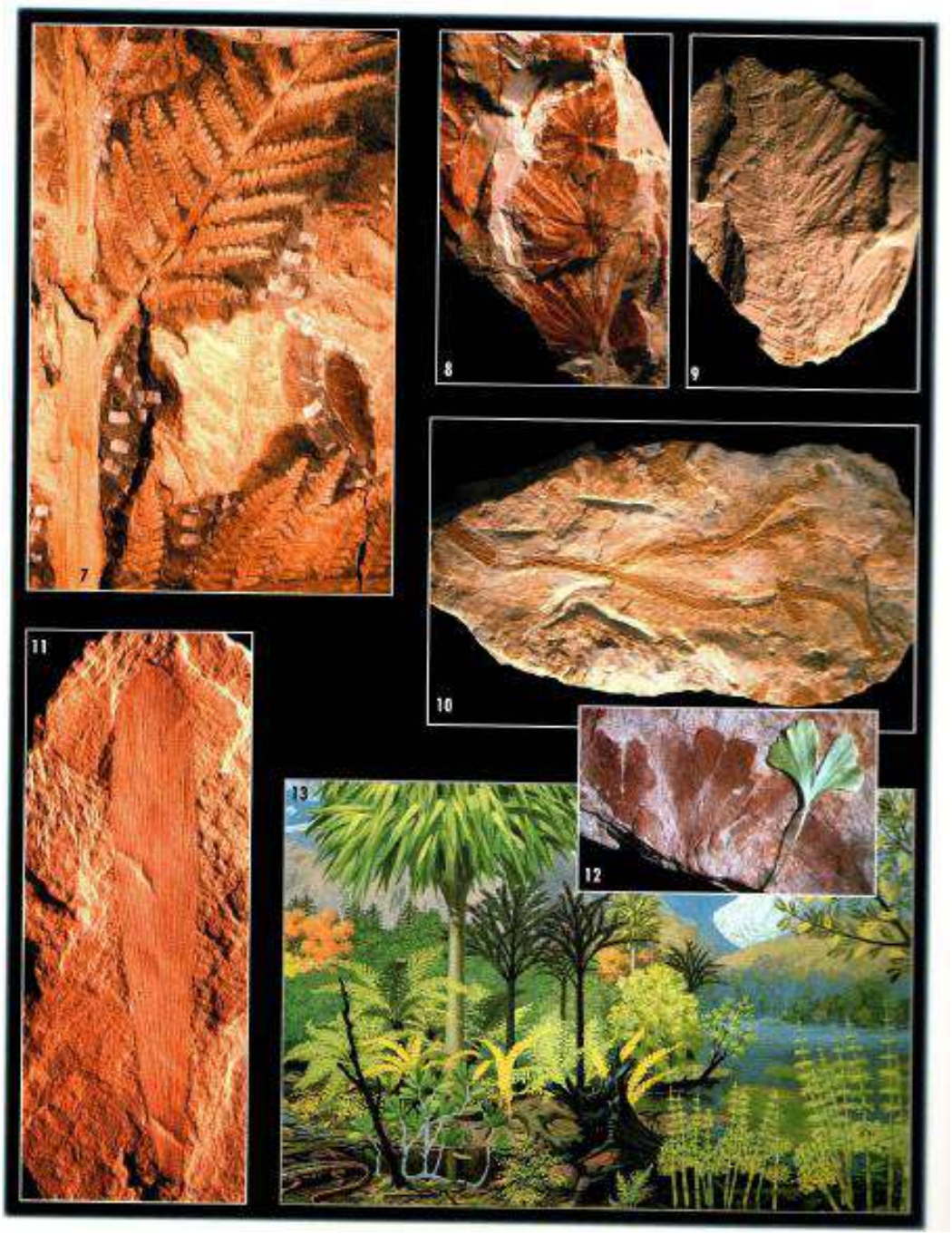


Heidi Fourie
2024/10/22

Appendix 1: Example of Vryheid Formation Fossils (MacRae 1999)



Appendix 2: Protocol for Chance Finds and Management Plan **(1k,l,m)**

This section covers the recommended protocol for a Phase 2 Mitigation process as well as for reports where the Palaeontological Sensitivity is **LOW**; this process guides the palaeontologist / palaeobotanist on site and should not be attempted by the layman / developer. As part of the Environmental Authorisation conditions, an Environmental Control Officer (ECO) will be appointed to oversee the construction activities in line with the legally binding Environmental Management Programme (EMPr).

- As part of the Environmental Authorisation conditions, an Environmental Control Officer (ECO) will be appointed to oversee the construction/prospecting/mining activities in line with the legally binding Environmental Management Programme (EMPr) so that when a fossil is unearthed they can notify the relevant department and specialist to further investigate.
- The ECO should familiarise him- or herself with the applicable formations and its fossils.
- The EMPr already covers the conservation of heritage and palaeontological material that may be exposed during construction activities.
- It is recommended that the EMPr be updated to include the involvement of a palaeontologist for pre-construction training of the ECO or during the digging and excavation phase of the development.
- The ECO must visit the site after clearing, drilling, excavations and blasting and keep a photographic record.
- The developer may be required to survey the areas affected by the development and indicate on plan where the construction / development / mining will take place. Trenches may have to be dug to ascertain how deep the sediments are above the bedrock (can be a few hundred metres). This will give an indication of the depth of the topsoil, subsoil, and overburden, if need be trenches should be dug deeper to expose the interburden.
- For a chance find, the protocol is to immediately cease all construction activities, construct a 30 m no-go barrier, and contact SAHRA for further investigation. Construction workers must be informed that this is a no-go area.
- A representative sample must be put aside for inspection. This sample can be sent to a recognised palaeontological repository for curation and safe keeping after the permit was obtained.

The palaeontological impact assessment process presents an opportunity for identification, access and possibly salvage of fossils and add to the few good localities. Mitigation can provide valuable onsite research that can benefit both the community and the palaeontological fraternity. A Phase 2 study is very often the last opportunity we will ever have to record the fossil heritage within the development area. Fossils excavated will be stored at a National Repository.

Mitigation will involve recording, rescue and judicious sampling of the fossil material present in the layers sandwiched between the geological / coal layers. It must include information on number of taxa, fossil abundance, preservational style, and taphonomy. This can only be done during mining or excavations. In order for this to happen, in case of coal mining operations, the process will have to be closely scrutinised by a professional palaeontologist / palaeobotanist to ensure that only the coal layers are mined and the interlayers (siltstone and mudstone) are surveyed for fossils or representative sampling of fossils are taking place.

The palaeontological impact assessment process presents an opportunity for identification, access and possibly salvage of fossils and add to the few good plant localities. Mitigation can provide valuable onsite research that can benefit both the community and the palaeontological fraternity.

A Phase 2 study is very often the last opportunity we will ever have to record the fossil heritage within the development area. Fossils excavated will be stored at a National Repository.

A Phase 2 Palaeontological Impact Assessment: Mitigation will include (SAHRA) -

1. Recommendations for the future of the site.
2. Description and purpose of work done (including number of people and their responsibilities).
3. A written assessment of the work done, fossils excavated, not removed or collected and observed.
4. Conclusion reached regarding the fossil material.
5. A detailed site plan and map.
6. Possible declaration as a heritage site or Site Management Plan.
7. Stakeholders.
8. Detailed report including the Desktop and Phase 1 study information.
9. Annual interim or progress Phase 2 permit reports as well as the final report.
10. Methodology used.

Mitigation involves planning the protection of significant fossil sites, rock units or other palaeontological resources and/or excavation, recording and sampling of fossil heritage that might be lost during development, together with pertinent geological data. The mitigation may take place before and / or during the construction phase of development. The specialist will require a Phase 2 mitigation permit from the relevant Heritage Resources Authority before a Phase 2 may be implemented.

The Mitigation is done in order to rescue representative fossil material from the study area to allow and record the nature of each locality and establish its age before it is destroyed and to make samples accessible for future research. It also interprets the evidence recovered to allow for education of the public and promotion of palaeontological heritage.

Should further fossil material be discovered during the course of the development (*e. g.* during bedrock excavations), this must be safeguarded, where feasible *in situ,* and reported to a palaeontologist or to the Heritage Resources authority. In situations where the area is considered palaeontologically sensitive (*e. g.* Karoo Supergroup Formations, ancient marine deposits in the interior or along the coast) the palaeontologist might need to monitor all newly excavated bedrock. The developer needs to give the palaeontologist sufficient time to assess and document the finds and, if necessary, to rescue a representative sample.

When a Phase 2 palaeontological impact study is recommended, permission for the development to proceed can be given only once the heritage resources authority has received and approved a Phase 2 report and is satisfied that (a) the palaeontological resources under threat have been adequately recorded and sampled, and (b) adequate development on fossil heritage, including, where necessary, *in situ* conservation of heritage of high significance. Careful planning, including early consultation with a palaeontologist and heritage management authorities, can minimise the impact of palaeontological surveys on development projects by selecting options that cause the least amount of inconvenience and delay.

Three types of permits are available; Mitigation, Destruction and Interpretation. The specialist will apply for the permit at the beginning of the process (SAHRA 2012).

The Palaeontological Society of South Africa (PSSA) does not have guidelines on excavating or collecting, but the following is suggested:

1. The developer needs to clearly stake or peg-out (survey) the areas affected by the mining/ construction/ development operations and dig representative trenches and if possible supply geological borehole data. When the route is better defined, it is recommended that a specialist undertake a 'walk through' of the entire road as well as construction areas, including camps and access roads, prior to the start of any construction activities, this may be done in sections.
2. When clearing vegetation, topsoil, subsoil or overburden, hard rock (outcrop) is found, the contractor needs to stop all work.

3. A Palaeobotanist / palaeontologist (contact SAHRIS for list) must then inspect the affected areas and trenches for fossiliferous outcrops / layers. The contractor / developer may be asked to move structures, and put the development on hold.
4. If the palaeontologist / palaeobotanist is satisfied that no fossils will be destroyed or have removed the fossils, development and removing of the topsoil can continue.
5. After this process the same palaeontologist / palaeobotanist will have to inspect and offer advice through the Phase 2 Mitigation Process. Bedrock excavations for footings may expose, damage or destroy previously buried fossil material and must be inspected.
6. When permission for the development is granted, the next layer can be removed, if this is part of a fossiliferous layer, then with the removal of each layer of sediment, the palaeontologist / palaeobotanist must do an investigation (a minimum of once every week).
7. At this stage the palaeontologist / palaeobotanist in consultation with the developer / mining company must ensure that a further working protocol and schedule is in place. Onsite training should take place, followed by an annual visit by the palaeontologist / palaeobotanist.

Fossil excavation if necessary, during Phase 2:

1. Photography of fossil / fossil layer and surrounding strata.
2. Once a fossil has been identified as such, the task of extraction begins.
3. It usually entails the taking of a GPS reading and recording lithostratigraphic, biostratigraphic, date, collector and locality information.
4. Using Paraloid (B-72) as an adhesive and protective glue, parts of the fossil can be kept together (not necessarily applicable to plant fossils).
5. Slowly chipping away of matrix surrounding the fossil using a geological pick, brushes and chisels.
6. Once the full extent of the fossil / fossils is visible, it can be covered with a plaster jacket (not necessarily applicable to plant fossils).
7. Chipping away sides to loosen underside.
8. Splitting of the rock containing palaeobotanical material should reveal any fossils sandwiched between the layers.

This document forms part of the Environmental Monitoring Programme. For practical reasons a palaeontologist/palaeobotanist may be required to be on site as predetermined. If any fossil material is discovered then a Phase 2 rescue operation may be necessary, and a permit will be required.

The South African Heritage Resources Agency has the following documents in place:
Guidelines to Palaeontological Permitting policy.
Minimum Standards: Palaeontological Component of Heritage Impact Assessment reports.
Guidelines for Field Reports.
Palaeotechnical Reports (Eastern Cape, North West, Northern Cape, Mpumalanga, Gauteng, Western Cape, Free State, Kwazulu Natal, and Limpopo)

Appendix 3: Table 3: Listing points in Appendix 6 of the Act and position in Report (bold in text).

Section in Report	Point in Act	Requirement
B	1(c)	Scope and purpose of report
B	1(d)	Duration, date and season
B	1(g)	Areas to be avoided
D	1(ai)	Specialist who prepared report
D	1(aii)	Expertise of the specialist
F Figure 3	1(h)	Map
F, B	1(ni)(iA)	Authorisation
F, B	1(nii)	Avoidance, management, mitigation and closure plan
G Table 1	1(cA)	Quality and age of base data
G Table 2	1(cB)	Existing and cumulative impacts
G, D	1(f)	Details or activities of assessment
G	1(j)	Description of findings
H	1(e)	Description of methodology
H	1(i)	Assumptions
J	1(o)	Consultation
J	1(p)	Copies of comments during consultation
J	1(q)	Information requested by authority
Declaration	1(b)	Independent declaration
Appendix 2	1(k)	Mitigation included in EMPr
Appendix 2	1(l)	Conditions included in EMPr
Appendix 2	1(m)	Monitoring included in EMPr
D	2	Protocol or minimum standard

Appendix 4: Impact Statement

Part of the development footprint is situated on the Karoo Supergroup with a **VERY HIGH** palaeontological sensitivity. **The nature of the impact is the destruction of Fossil Heritage.** Loss of fossil heritage will have a negative impact.

In the absence of mitigation procedures (should fossil material be present within the affected area) the damage or destruction of any palaeontological materials will be irreversible. With Mitigation the impact will be moderate and the cumulative impact is low. Impacts on palaeontological heritage during the construction and preconstruction phase could potentially occur and is regarded as having a high possibility. The significance of the impact occurring will be as below:

Impact	**Rating before**	**After Mitigation**
The extent of the impact only extends in the region of the development activity footprint and may include transport routes.	2	2
The expected duration of the impact is assessed as potentially permanent.	5	5
The intensity/magnitude of the impact is high as it is destructive. Moderate, but modified.	8	6
The probability of the impact occurring will be definite and will occur regardless of preventative measures. Probable.	5	3
S= (E+D+M) P S= (2+5+8)5, S = 75 High (>60).	High	
S = (2+5+6)3, S = 39 Moderate (30-60)		Moderate

Mitigation: The following should be conserved:

- if any palaeontological material is exposed during clearing, digging, excavating, or drilling SAHRA must be notified. All mining activities must be stopped, a 30 m no-go barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures.
- The Chance Fossil Find Protocol must be followed.

All Phases whether it be clearing, digging and prospecting will have the same impact as the geological layers are intruded.

HYDROLOGICAL INVESTIGATION FOR THE PROPOSED PROSPECTING RIGHT APPLICATION FOR COAL IN RESPECT OF FARM LOTMGA 8761 GT, FARM KAISHA 14719 GT, FARM OSAKA 12977 GT, FARM KROMPOORT 2155 GT AND FARM RAVINE 9201 GT IN THE ESTCOURT MAGISTERIAL DISTRICT, KWAZULU-NATAL PROVINCE.

October 2024

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Document Control	**Acumen Environmental (Pty) Ltd**		Report No.:	23-H-295
Report Title	HYDROLOGICAL INVESTIGATION FOR THE PROPOSED PROSPECTING RIGHT APPLICATION FOR COAL IN RESPECT OF FARM LOTMGA 8761 GT, FARM KAISHA 14719 GT, FARM OSAKA 12977 GT, FARM KROMPOORT 2155 GT AND FARM RAVINE 9201 GT IN THE ESTCOURT MAGISTERIAL DISTRICT, KWAZULU-NATAL PROVINCE.			
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LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
EA	Environmental Authorisation
EC	Electrical Conductivity (mS/m)
EIA	Environmental Impact Assessment
GIS	Geographic Information Systems
HA	Hectares
MAMSL	Meters Above Mean Sea Level
MBGL	Meters Below Ground Level
NEMA	National Environmental Management Act
NGA	National Groundwater Archive
NWA	National Water Act (Act 36 of 1998)
SANAS	South African National Accreditation System
SANS	South African National Standards
TDS	Total Dissolved Solids
WM	With Mitigation
WMA	Water Management Area
WOM	Without Mitigation

GLOSSARY

A confined aquifer - a formation in which the groundwater is isolated from the atmosphere at the point of discharge by impermeable geologic formations; confined groundwater is generally subject to pressure greater than atmospheric pressure.

An unconfined, water table or phreatic aquifer - are different terms used for the same aquifer type which is bounded from below by an impermeable layer.

Aquifer – A body of rock, consolidated or unconsolidated, that is sufficiently permeable to conduct groundwater and to yield significant quantities of water to wells and springs.

Bedrock – A general term for the rock that underlies soil or other unconsolidated superficial material.

Cone of depression – A depression in the potentiometric surface of a body of groundwater that has the shape of an inverted cone and develops around a well/mine shaft/open pit mine from which water is being withdrawn.

Drawdown – The decline of the water table or potentiometric surface as a result of withdrawals from wells or excavations.

Effective porosity - is the percentage of the bulk volume of a rock or soil that is occupied by interstices that are connected.

Fault – A fracture or fracture zone along which there has been displacement of the sides relative to one another parallel to the fracture.

Fracture – A crack, joint, fault or other break in rocks caused by mechanical failure.

Groundwater table - is the surface between the zone of saturation and the zone of aeration; the surface of an unconfined aquifer.

Heterogeneous -indicates non-uniformity in a structure.

Hydraulic conductivity (K) - Measure of the ease with which water will pass through the earth's material; defined as the rate of flow through a cross-section of one square metre under a unit hydraulic gradient at right angles to the direction of flow.

Hydraulic gradient - is the rate of change in the total head per unit distance of flow in a given direction.

Joint – A fracture in rock along which there has been no visible movement.

Observation borehole - is a borehole drilled in a selected location for the purpose of observing parameters such as water levels.

Perched Water Table – The upper surface of a body of unconfined groundwater separated from the main body of groundwater by unsaturated material.

Permeability - the ease with which a fluid can pass through a porous medium and is defined as the volume of fluid discharged from a unit area of an aquifer under unit hydraulic gradient in unit time.

pH - is a measure of the acidity or alkalinity of a solution, numerically equal to 7 for neutral solutions, increasing with increasing alkalinity and decreasing with increasing acidity.

Recharge - is the addition of water to the zone of saturation; also, the amount of water added.

Static water level - is the level of water in a borehole that is not being affected by withdrawal of groundwater.

Storativity - the volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head. It is a volume of water per volume of aquifer released as a result of a change in head.

Total dissolved solids (TDS) - is a term that expresses the quantity of dissolved material in a sample of water.

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CONTENTS

1. INTRODUCTION AND TERMS OF REFERENCE

By September 2024 Acumen Environmental (Pty) Ltd was appointed by Vahlengwe Advisory to conduct a hydrological investigation for the proposed prospecting right application for Coal in respect of Farm Lotmga 8761 Gt, Farm Kaisha 14719 Gt, Farm Osaka 12977 Gt, Farm Krompoort 2155 Gt and Farm Ravine 9201 Gt in the Estcourt Magisterial District, Kwazulu-Natal Province.

The purpose of this report is to describe the catchment and project area in respect of surface water resources and hydrological data that will inform the impact assessment, and stormwater management components. These will support the application for Environmental Authorisation (EA) and Environmental Impact Assessment (EIA).

This report is not intended to be an exhaustive description of all the tasks performed, but rather a summary of the most important findings.

2. PURPOSE AND OBJECTIVES

The Scope of work for the Hydrological Impact Assessment allows for the following:

- Identify Water Management Areas and Quaternary Catchment Areas in the Project area;
- Flood line delineation;
- Identify potential Hydrological Impacts Associated with the proposed Activity;
- Compile an impact assessment; rating the identified potential impacts based on significance scoring before and after mitigation methods are implemented;
- Recommend management measures to minimise impacts; and
- Develop a storm water management plan.

3. LEGAL REQUIREMENTS

This section outlines the national requirements related only to hydrological specialist field. For this Hydrological Assessment, the principal act of relevance is The National Water Act, 1998 (Act 36 of 1998) which provides for the protection, usage, development, conservation, management, and control of the country's water resources in an integrated manner. The Act provides the legal basis, upon which to develop tools and means to give effect to the protection of water resources.

The study was undertaken to comply with the requirements of relevant legislation and guidelines which include:The National Water Act, Act 36 of 1998 (NWA);

- The National Water Act, Act 36 of 1998 (NWA);
- Government Notice “Regulations 704” as published in Government Gazette, Volume 408, No 20119 of June 1999 (Also known as General Notice 704, 04 June 1999).
- Best Practice Guidelines for the Protection of Water Resources (prescribed by the DWS, previously known as the Department of Water Affairs and Forestry (DWAF)): and
- National Environmental Management Act, Act 107 of 1998 (NEMA).

4. SITE DESCRIPTION

The proposed development site (here after referred to as “the site”) in respect of Farm Lotmga 8761 Gt, Farm Kaisha 14719 Gt, Farm Osaka 12977 Gt, Farm Krompoort 2155 Gt and Farm Ravine 9201 Gt in the Estcourt Magisterial District, Kwazulu-Natal Province. The site covers an area of approximately 3102.59 hectares.

The prospecting area is situated about 36,63 km East south of Ladysmith town and 29,60 km East south of Umbulwana Village and it can be accessed via the R74 road, in the Estcourt District in KwaZulu-Natal Province. **Figure 1** shows the topographic map of the site and **Figure 2** shows the site satellite map.

The central co-ordinates that can be used to locate the site are:

28° 43' 47" S, 30° 4' 7" E

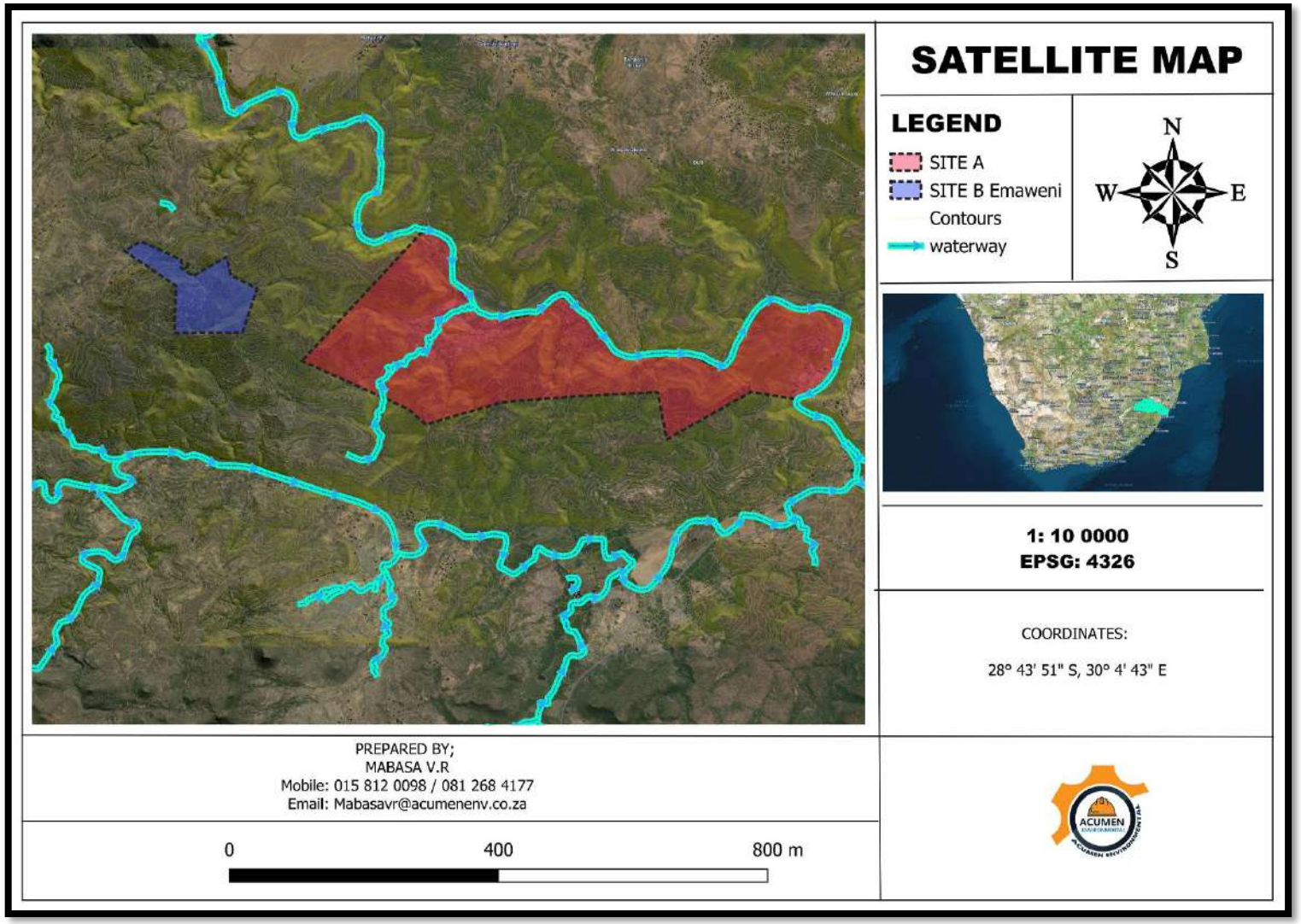

Figure 1: Satellite map.

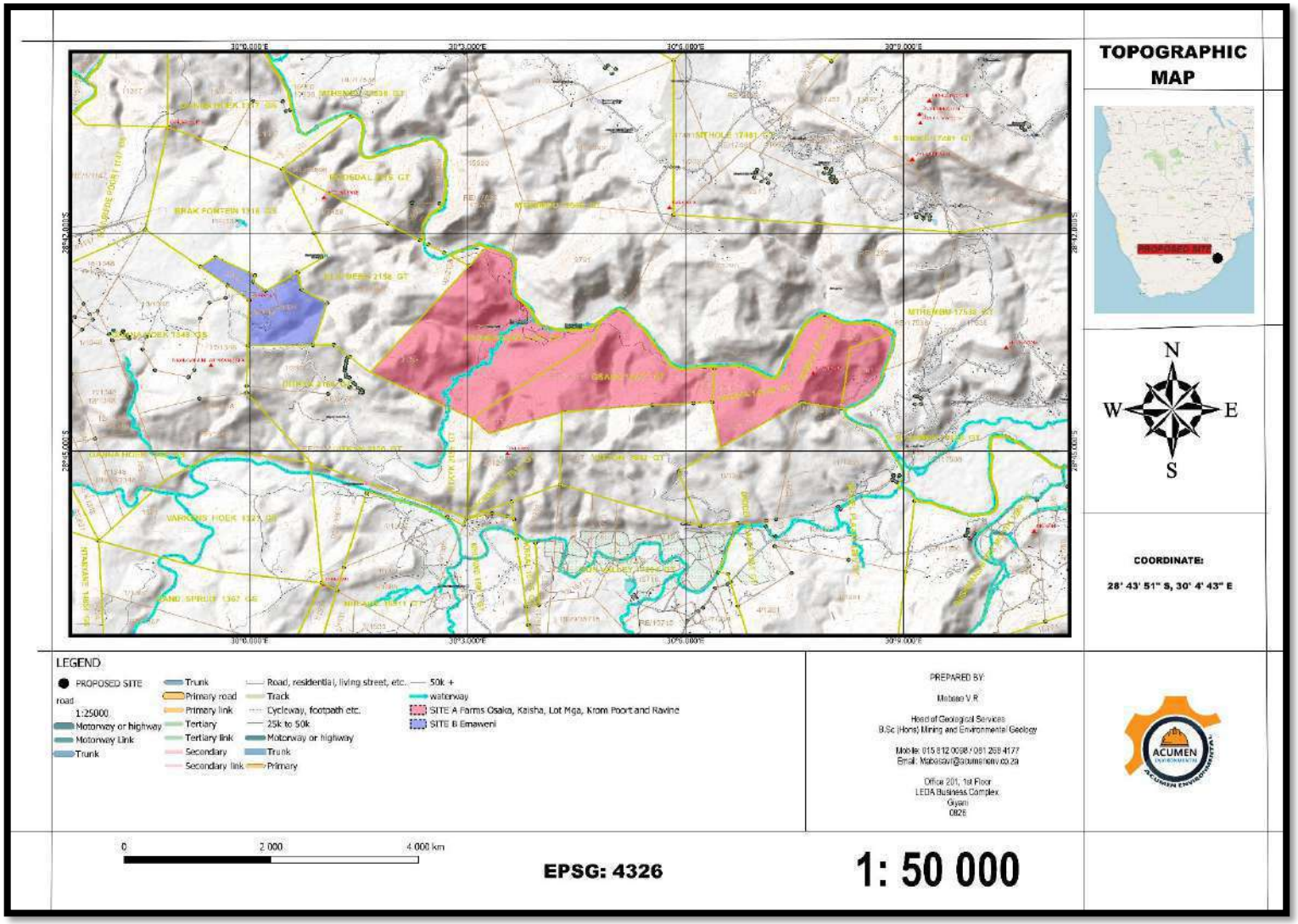

Figure 2: Locality Map

5. METHODOLOGY

5.1. DESKTOP ASSESSMENT

The assessment was initiated with a desktop study to gather hydrological, catchment description reviews and analysis of various sources of rainfall and evaporation data. The section also presents the baseline hydrology of the site and surroundings including topography, watercourse network and catchment delineation. The catchment attributes namely Mean Annual Runoff, Mean Annual Precipitation and Mean Annual Evaporation were obtained from the Water Research Commission (WRC, 2012). In addition, the hydrological data was reviewed and assessed for relevance, to characterise the site, identify water features, and for hydrological characterisation.

6. BASELINE ASSESSMENT

The baseline describes the catchment and project area in respect of surface water resources and hydrological data for the current situation. It informs the impact assessment, and stormwater management components that support the various legislative requirements.

- Climate
- Regional Geology
- Geohydrology
- Wetlands
- Catchment analysis.
- Floodline analysis

6.1. Climate

Ladysmith, located in the KwaZulu-Natal province of South Africa, has a semi-arid, subtropical climate with warm summers and mild winters:

- **Summer (November to February)**: Summers are hot, with average daytime temperatures between 28–32°C. Thunderstorms are common in the afternoons, bringing most of the region's rainfall, which averages around 600–700 mm annually.
- **Autumn (March to May)**: Temperatures cool slightly, with highs around 22–28°C. Rainfall decreases, and days are generally sunny and mild.

- **Winter (June to August)**: Winters are dry and mild, with daytime highs around 18–23°C. Nights can get chilly, with temperatures sometimes dropping to around freezing, especially in July.
- **Spring (September to October)**: Temperatures begin to warm up, with daytime highs in the mid-20s°C, and rain starts to return, leading into the summer thunderstorm season.

6.2. Effects of climate on hydrology

The climate plays a significant role in shaping the hydrology of the study area influencing both surface water and groundwater systems. Key climatic factors affecting the region's hydrology include temperature, precipitation patterns, evaporation rates, and seasonal variations.

The climate in Ladysmith, characterized by seasonal rainfall and dry winters, has a significant impact on the area's hydrology. Here are some key effects:

Seasonal Water Availability:

With most of Ladysmith's rain falling in the summer, rivers and reservoirs in the region experience seasonal fluctuations in water levels. This leads to high flow rates during the rainy season and low flows or even dry conditions in the winter.

The Klip River, which runs through Ladysmith, experiences these seasonal variations, impacting water availability for agriculture, industry, and residential use.

Drought Vulnerability:

The semi-arid conditions and limited rainfall make Ladysmith susceptible to drought, particularly during dry winter months. This increases the strain on groundwater and surface water resources, which are critical for the town and surrounding agricultural activities. Extended drought periods can reduce the recharge of aquifers and lower reservoir levels, affecting water security.

Flash Flooding:

Thunderstorms during the summer months can produce intense rainfall over short periods, leading to flash floods. The Klip River and other smaller streams in the area are prone to rapid rises in water levels, causing flooding in low-lying areas, including parts of Ladysmith. These flash floods can erode riverbanks, damage infrastructure, and affect water quality by carrying sediment and pollutants into rivers.

Groundwater Recharge:

Rainfall in Ladysmith contributes to groundwater recharge, though its seasonal nature can limit consistent replenishment. During dry seasons, groundwater levels may drop, affecting borehole yields and reducing the water available for agriculture and other uses. However, the high-intensity rains during summer can help partially replenish groundwater levels, especially in areas with permeable soils.

Water Quality Issues:

The climate-driven flow variations impact water quality in the region. During heavy rains, runoff can carry pollutants, including agricultural and urban waste, into rivers and reservoirs. Conversely, in drier periods, lower flow rates can lead to higher concentrations of pollutants, reducing water quality for residents and ecosystems.

6.3. REGIONAL GEOLOGY

The Vryheid Formation, part of the Ecca Group within the Karoo Supergroup. s composition and sedimentary characteristics make it especially important for coal mining. The formation is primarily made up of a mix of sedimentary rocks, including sandstones, siltstones, shales, and coal seams. Its sandstones are often coarse-grained, while the shales are fine-grained and dark, reflecting organic-rich conditions that were conducive to coal formation.

One of the most notable features of the Vryheid Formation is its extensive coal seams, which were formed from the accumulation of plant material in ancient swampy environments. The Vryheid Formation contains several thick and laterally extensive coal seams, which are economically important and have been mined for over a century.

The Vryheid Formation is a major source of South Africa's coal, providing much of the coal used for electricity generation and export. The coal seams within the formation are generally bituminous, suitable for thermal energy production, and are also sometimes used in metallurgical processes. The lithologies present in the study area are illustrated in **Figure 3.**

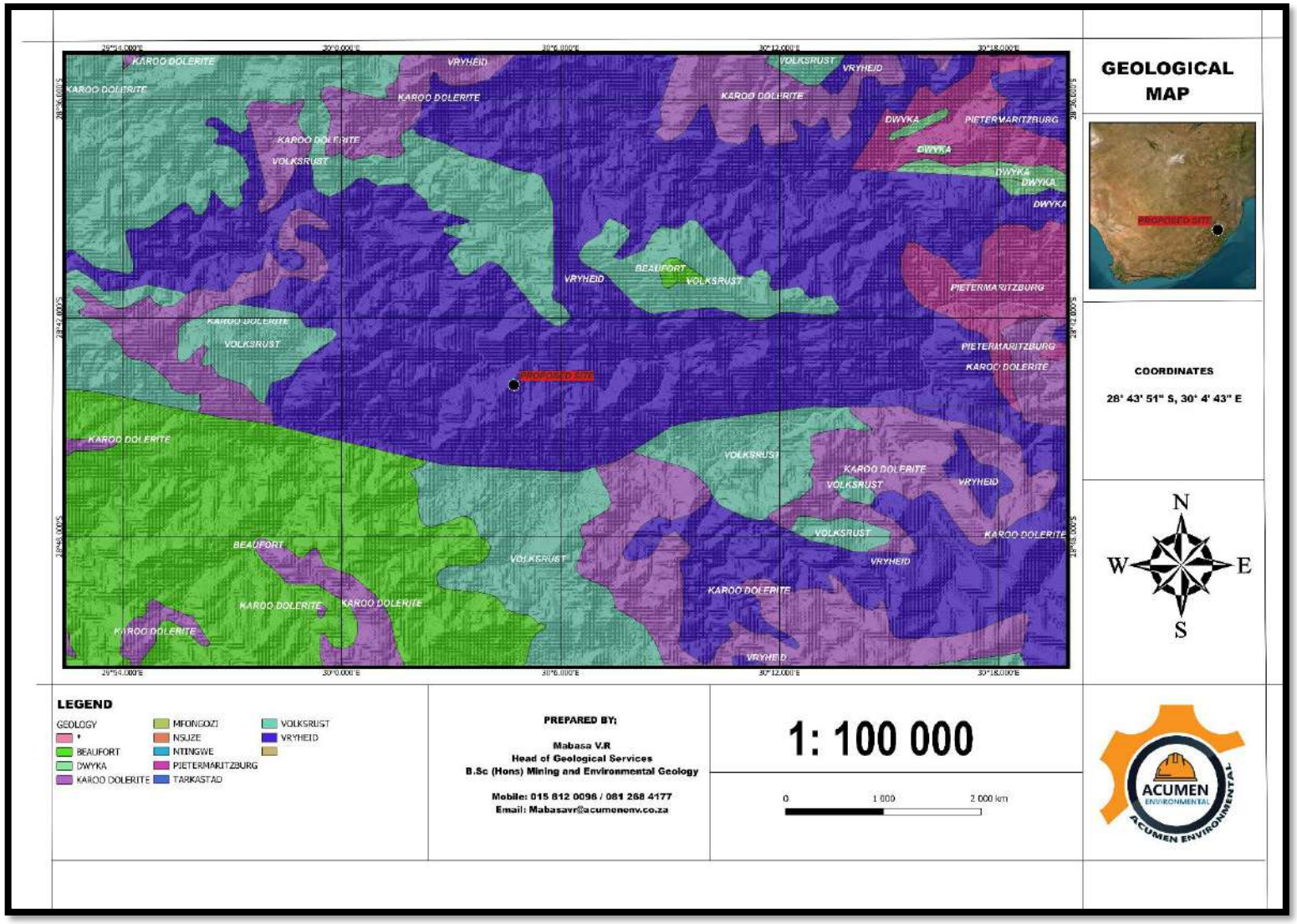

Figure 3: Geological Map

6.4. Regional Geohydrology

The Vryheid Formation is associated primarily with **fractured and fractured-intergranular aquifers**, which result from its sedimentary rock characteristics and coal-bearing structure. Here's an overview of the aquifer types within the formation:

Fractured Aquifers:

Groundwater in the Vryheid Formation primarily exists within fractures and joints in sandstone, coal, and, to a lesser extent, shale layers. These fractures provide pathways and limited storage for groundwater, and groundwater movement is often restricted to these zones.

Fractured aquifers in the Vryheid Formation have moderate hydraulic conductivity, especially where sandstone or coal is predominant. Shales have very low permeability, limiting water flow and acting as barriers within the aquifer system. Fractured aquifers typically have low to moderate yields, depending on the degree of fracturing and the connectivity of these fractures. Recharge is limited due to the semi-arid climate, affecting the sustainable yield of these aquifers.

Fractured-Intergranular Aquifers:

In areas where the sandstone layers have undergone weathering, an additional intergranular (pore-based) component may be present, resulting in fractured-intergranular aquifers. Weathered zones in the sandstone can hold groundwater in the pore spaces, supplementing storage provided by fractures.

The weathered sandstone zones have enhanced porosity compared to unweathered rock, allowing for moderate groundwater storage. However, overall permeability can still vary, as it depends on both the degree of fracturing and intergranular spaces.

Fractured-intergranular aquifers may have slightly higher recharge rates due to increased porosity in weathered zones, though recharge is still limited by climatic conditions. Groundwater flow in these aquifers is affected by both fracture networks and pore spaces, providing more stable yields than purely fractured zones.

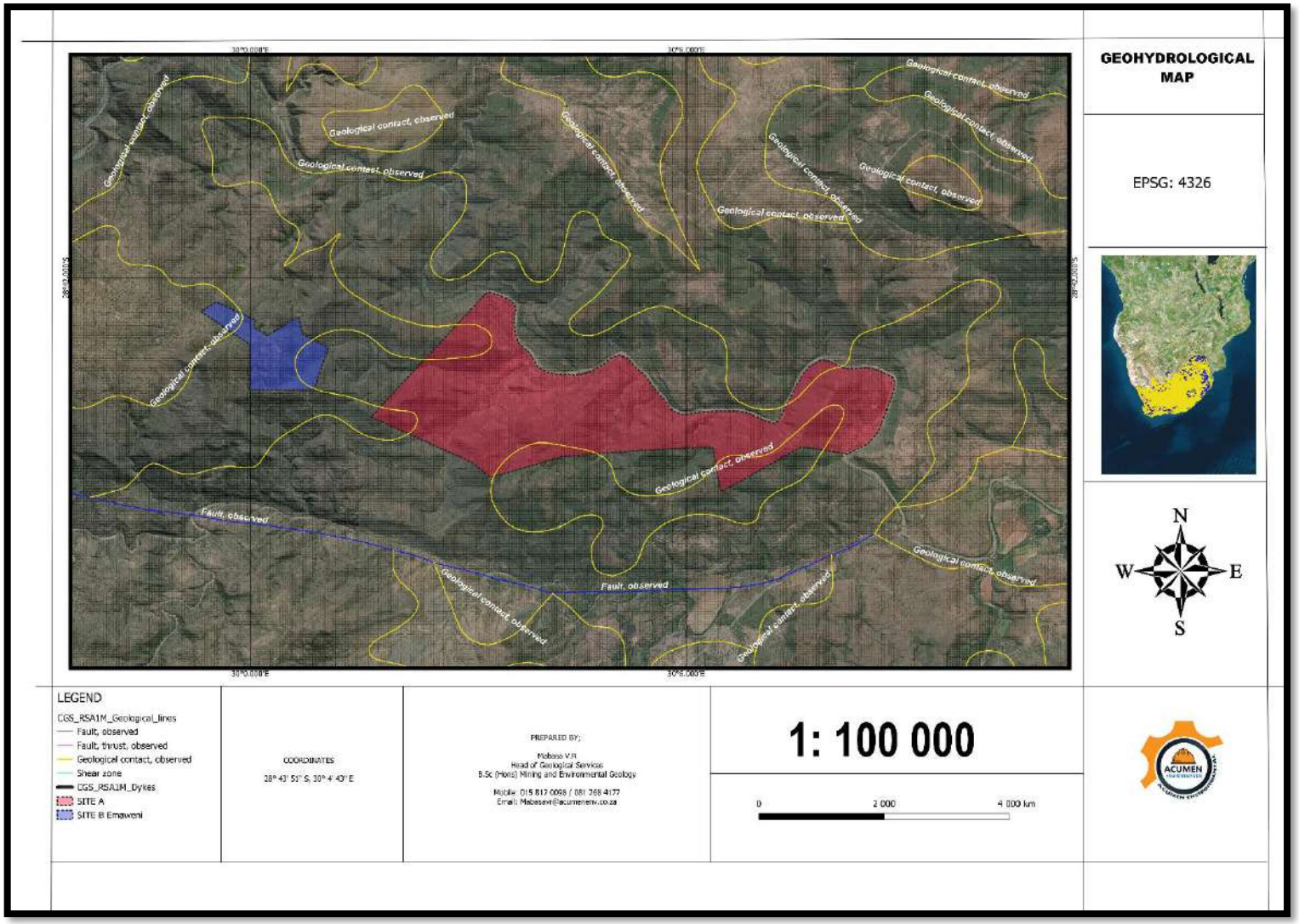

Figure 4: Geohydrological Map

6.5. Wetlands

A wetland is a distinct ecosystem characterized by its saturated soil conditions, which support a variety of plant and animal species adapted to living in wet environments. Wetlands are transitional areas between terrestrial and aquatic systems and can be found in diverse geographic locations, from coastal regions to inland areas. **Figure 7** represents a Map of the wetlands found near the site.

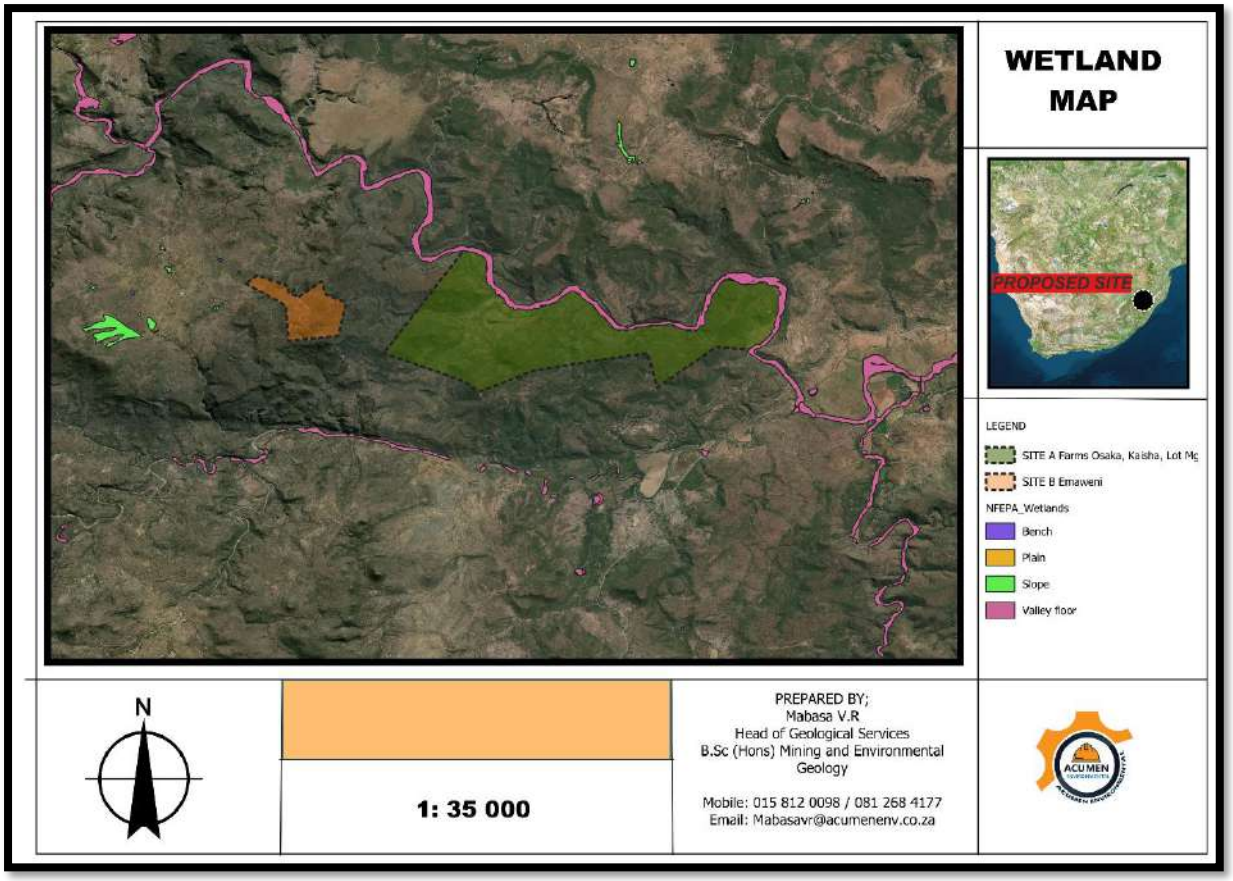

Figure 5: *Wetland Map*

6.6. Soil Map

The soils associated with the Vryheid Formation are typically derived from the weathering of its predominant lithologies—sandstone, shale, and coal seams. These soils vary in texture, fertility, and drainage characteristics based on the composition of the underlying rock. Here's a summary of the soil types associated with the Vryheid Formation:

Sandy Soils (Derived from Sandstone)

Soils overlying sandstone in the Vryheid Formation tend to be sandy and well-drained due to the coarse-grained nature of sandstone. These soils have a gritty texture and are often pale in color.

Clayey Soils (Derived from Shale)

Soils derived from shale lithology are usually clayey and fine-textured, as shales are rich in fine-grained clay minerals. These soils can be heavy, compact, and prone to cracking during dry periods.

Loamy Soils (Mixed Derived Soils)

In areas where sandstone and shale layers are interbedded or where there is a mix of weathered rock types, soils may have a loamy texture, combining sand, silt, and clay fractions. These soils offer a balance of drainage and water-holding capacity.

Coal-Derived Soils

Soils that form above coal seams can be dark, with high organic content from weathered coal materials. These soils may have a higher carbon content but can also be acidic due to the presence of sulfur compounds commonly found in coal.

Acidic Soils (Due to Coal and Pyrite Oxidation)

In areas impacted by coal mining or where pyrite (iron sulfide) within the coal and shale is exposed to oxidation, acid sulfate soils may form. These soils are acidic and often poor in nutrients.

Table 1: Hydrological Impact

Soil Type	Characteristics	Properties	Significance in Coal Mining
Arenosols	Sandy soils, found over sandy or coarse-grained materials	Well-drained, low nutrient-holding capacity, prone to erosion	Limited impact on mining; less erosion risk but poor fertility for vegetation.
Regosols	Weakly developed soils in unconsolidated materials	Variable texture, poorly developed, lacking distinct horizon	Minimal impact on coal mining; often found in disturbed areas.
Luvisols	Clay-rich soils, developed over clay-rich shales	Fertile, good water-holding capacity	Can be impacted by mining; potential for subsidence and erosion if disturbed.
Vertisols	Clay-rich soils that expand and shrink with moisture	High fertility, good nutrient retention, challenging for farming due to cracking	Risk of structural instability in mining areas; can affect surface drainage.
Gleysols	Poorly drained soils, often found in low-lying areas	High water table, anaerobic conditions, mottled coloration	Can hinder mining operations; high water tables may complicate excavation.
Lithosols	Shallow soils forming directly on bedrock or unconsolidated materials	Very low water-holding capacity, nutrient-poor, thin and poorly developed	Minimal direct impact on coal extraction; however, can be associated with exposed coal seams.

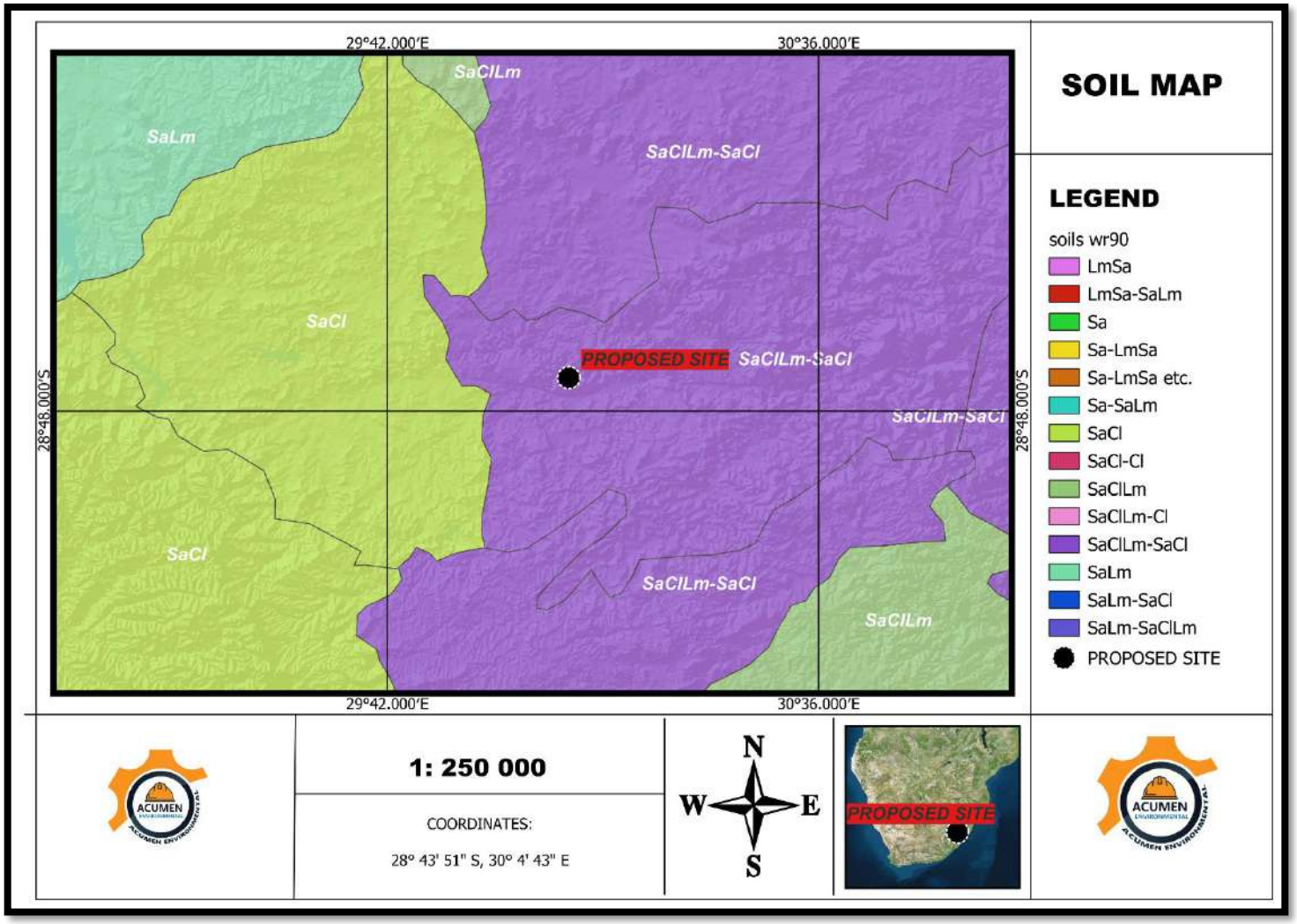

Figure 6: Soil Map

6.7. CATCHMENT ANALYSIS

6.7.1.Water Management Area No: 04

The existing river systems in relation to the proposed site are categorized in 3 Tiers as follows:

- Tier 1- Water Management Area No: 04.
- Tier 2- Quaternary Catchment: **V14E.**
- Tier 3- Site specific Catchment Areas.

The WMA and catchment areas are discussed in detail below.

6.7.2. WATER MANAGEMENT AREA NO: 04

Water Management Area (WMA) 4, known as the **Mvoti to Umzimkulu Water Management Area**, is one of South Africa's designated water management areas in the KwaZulu-Natal province. This area includes several river catchments that flow through major cities, agricultural areas, and industrial hubs, making water resource management critical for supporting regional economic activities, rural communities, and environmental sustainability.

Geographic Coverage

Rivers and Catchments: WMA 4 includes several significant river catchments: the Mvoti, Mzimkhulu, Mkomazi, Mzimayi, Lovu, and Umgeni rivers. The Umgeni River is particularly important as it supplies much of the water for Durban and the surrounding metropolitan areas.

Municipalities and Cities: Major cities such as Durban, Pietermaritzburg, and smaller towns like Ladysmith fall within this WMA. This area supports a large population, with metropolitan areas and smaller communities depending on its water resources.

Hydrological Characteristics

Rainfall: The region experiences variable rainfall, with the coast and higher-altitude inland areas receiving higher annual rainfall compared to lower areas. Rainfall occurs predominantly in summer, which can lead to seasonal water abundance and scarcity.

Groundwater and Surface Water: WMA 4 relies heavily on surface water from rivers and reservoirs, though groundwater plays a significant role in rural water supply. The rivers in this area flow to the Indian Ocean, providing ecological connectivity along their courses.

Water Use and Demand

Urban and Industrial: Durban and Pietermaritzburg are industrial hubs, creating high water demand for industrial processes, domestic use, and sanitation. The coastal region is highly urbanized, and water demands are continually increasing with population growth and economic expansion.

Agriculture: Agriculture is a key water consumer in the Mvoti to Umzimkulu WMA. Sugarcane, fruit, and forestry plantations require significant water resources, particularly in the drier inland areas, where irrigation is essential for productivity.

Ecological Needs: River ecosystems and estuaries in this WMA require careful management to maintain ecological flow levels, which sustain biodiversity, reduce pollution impacts, and support tourism activities, such as fishing and ecotourism along the rivers and coast.

Water Resource Challenges

Water Scarcity and Drought: Seasonal rainfall variability and periodic droughts challenge water availability, especially in dry years. This scarcity places stress on rivers, reservoirs, and groundwater sources, particularly during peak demand in the dry season.

Pollution: Industrial discharge, agricultural runoff, and urban wastewater affect water quality in this WMA, especially in densely populated areas. Nutrient and pollutant loading in rivers can lead to eutrophication, harming ecosystems and impacting water for human use.

Invasive Species: Invasive alien plant species, such as water hyacinth and black wattle, consume large quantities of water, reduce surface water flow, and impact river health, compounding water scarcity issues.

Climate Change: Rising temperatures and shifting rainfall patterns affect river flow, increasing the frequency of droughts and floods. This unpredictability demands adaptive water management strategies to ensure sustainable water supply.

Water Management Initiatives

Umgeni Water Board: Umgeni Water is the main water utility responsible for water supply, treatment, and distribution in the area. They manage significant infrastructure, including dams, pipelines, and water treatment plants, to ensure adequate water for urban and rural populations.

Inter-Basin Transfers: To augment water supply, there are inter-basin transfers, such as the Mooi-Mgeni Transfer Scheme, which transfers water from the Mooi River to the Umgeni River catchment to secure water for the Durban-Pietermaritzburg corridor.

Conservation and Invasive Species Control: Efforts are underway to clear invasive plants and rehabilitate degraded catchment areas to improve water flow and quality. Partnerships between government, non-governmental organizations, and community groups are essential for this work.

Water Demand Management: Urban and industrial users are encouraged to adopt water-saving measures, and there is a push for efficient irrigation practices in agriculture to reduce wastage and improve water-use efficiency. **Figure 7** shows water management area No. 4.

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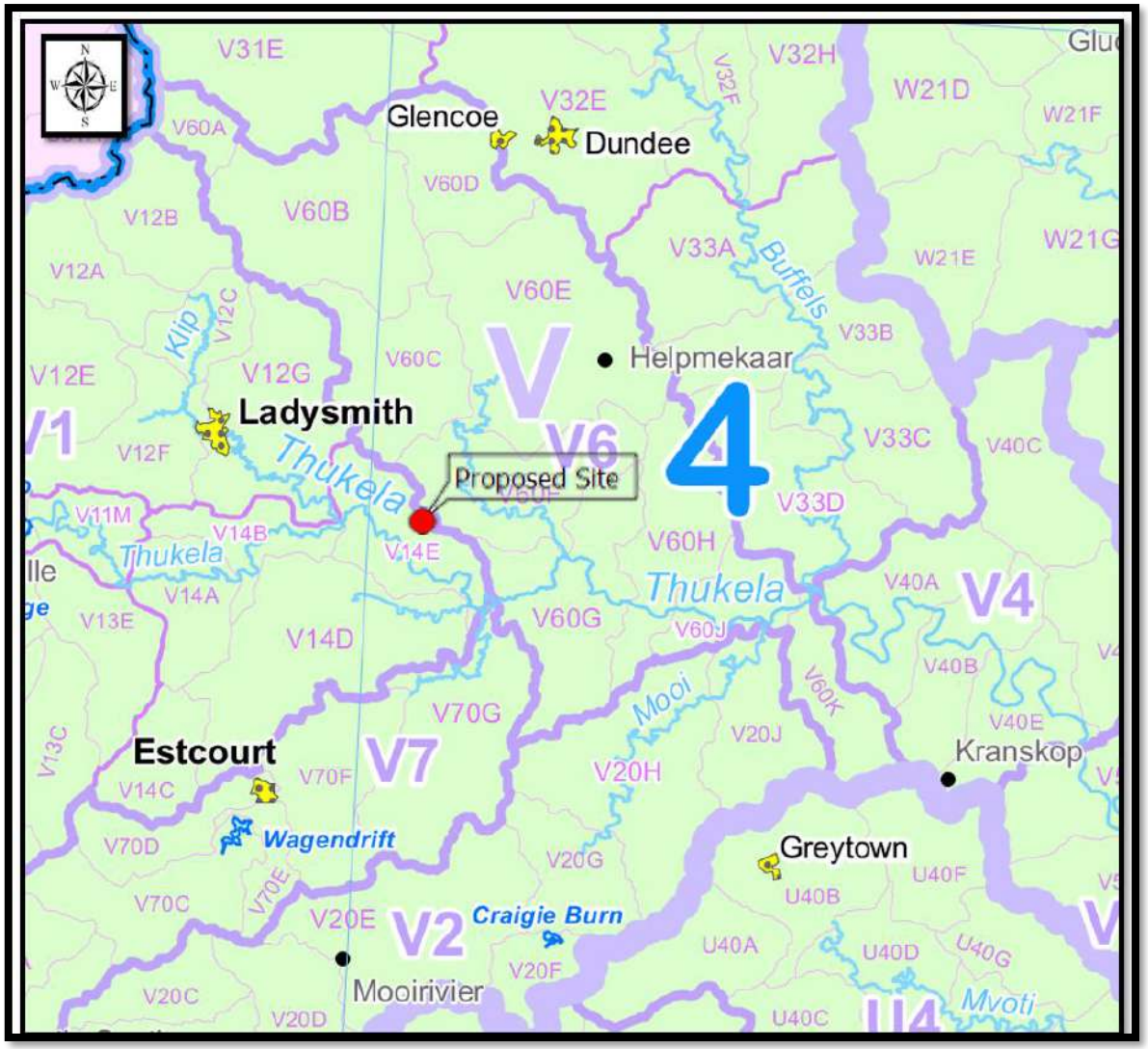

Figure 7: Water Management Area Map

6.7.3. QUATERNARY CATCHMENT

A catchment, in relation to a watercourse means the area from which any rainfall will drain into the watercourse or part of the water course through surface flow to a common point, or points (National Water Act, 1998, Act 36 of 1998). The study area is in Quaternary Catchment **V14E. (Figure 8)** which covers an area of approximately **327.80 km²**.

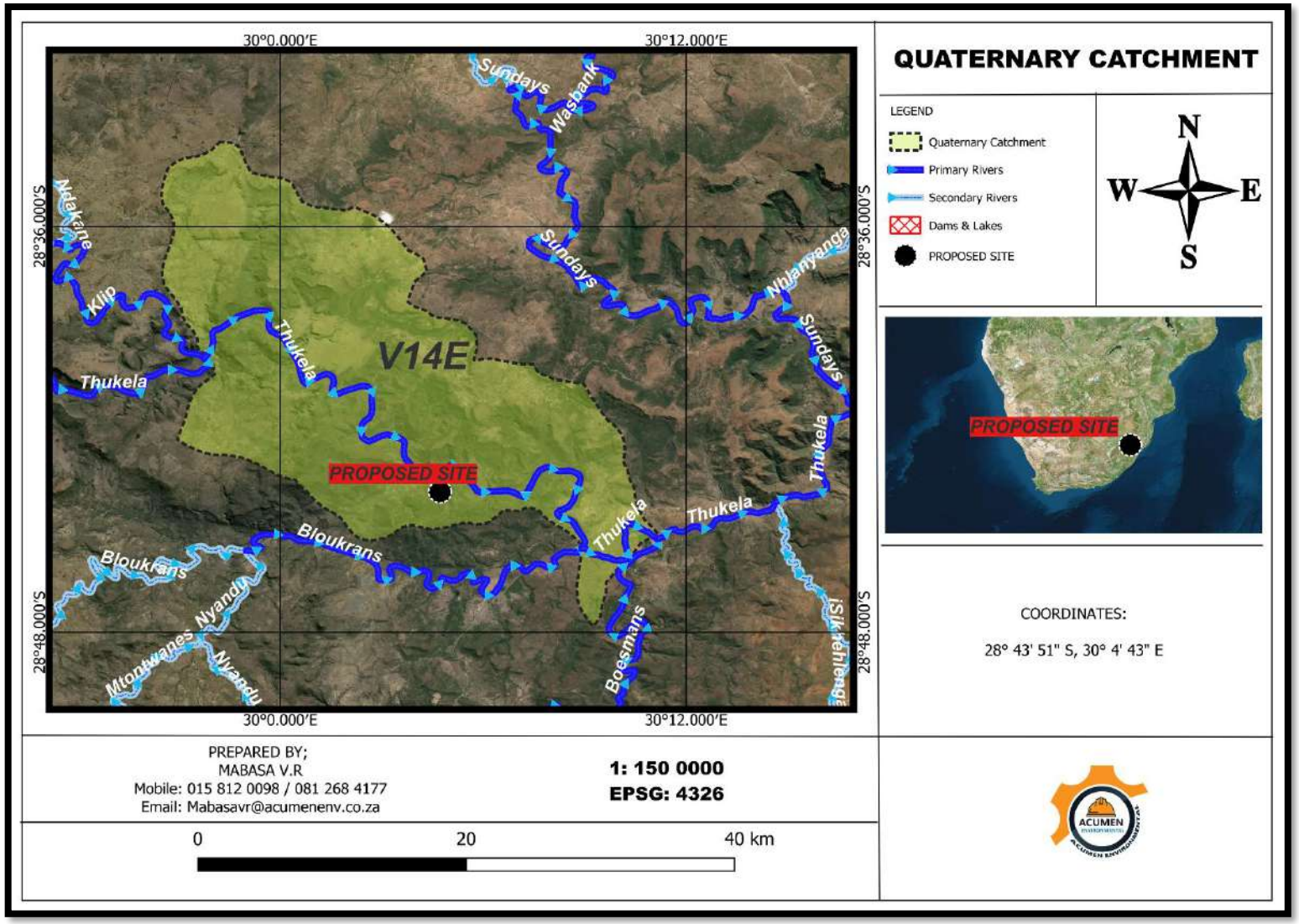

Figure 8: Quaternary Catchment

6.7.4. SIGNIFICANT SURFACE WATER RESOURCES

The Riet River is a significant watercourse within the proximity of the study area Thukela River. The Thukela River (also spelled Tugela) is one of South Africa's major rivers, flowing through the province of KwaZulu-Natal. It is known for its historical significance, ecological importance, and role in supplying water for both local and distant regions. Here's a detailed description of the Thukela River:

Geographical Source and Course

The Thukela River originates in the Drakensberg Mountains, near Mont-aux-Sources, close to the border of KwaZulu-Natal and Lesotho. Its source is at a high altitude (around 3,000 meters), resulting in steep, rapid flow in its upper reaches. The river flows approximately 502 kilometers in a generally eastward direction, descending through KwaZulu-Natal's varied landscapes before emptying into the Indian Ocean near Mandeni. The Thukela River's catchment area spans around 29,000 square kilometers, making it one of the largest river systems in the region. This catchment supports diverse ecosystems, agricultural land, and urban settlements.

Tributaries

The Thukela is fed by several important tributaries, including the Little Tugela, Bushmans, Klip, Mooi, Sundays, and Buffalo Rivers. These tributaries contribute significantly to the river's flow, particularly during the rainy season, and provide essential water resources for surrounding communities and agricultural activities.

Hydrology and Flow Regime

The Thukela River's flow is highly seasonal, with most rainfall occurring in the summer months (October to March). This seasonal rainfall leads to high flow rates in summer and lower flow in winter, with the potential for both droughts and flooding. During the rainy season, the Thukela can experience flash floods due to heavy rainfall in its upper catchment.

Floods have historically affected riverside communities and agricultural lands along its banks. The Thukela is also crucial in South Africa's inter-basin transfer schemes. Through the Thukela-Vaal Transfer Scheme, water from the Thukela is redirected to the Vaal River System, supplying water to Gauteng, the country's economic heartland.

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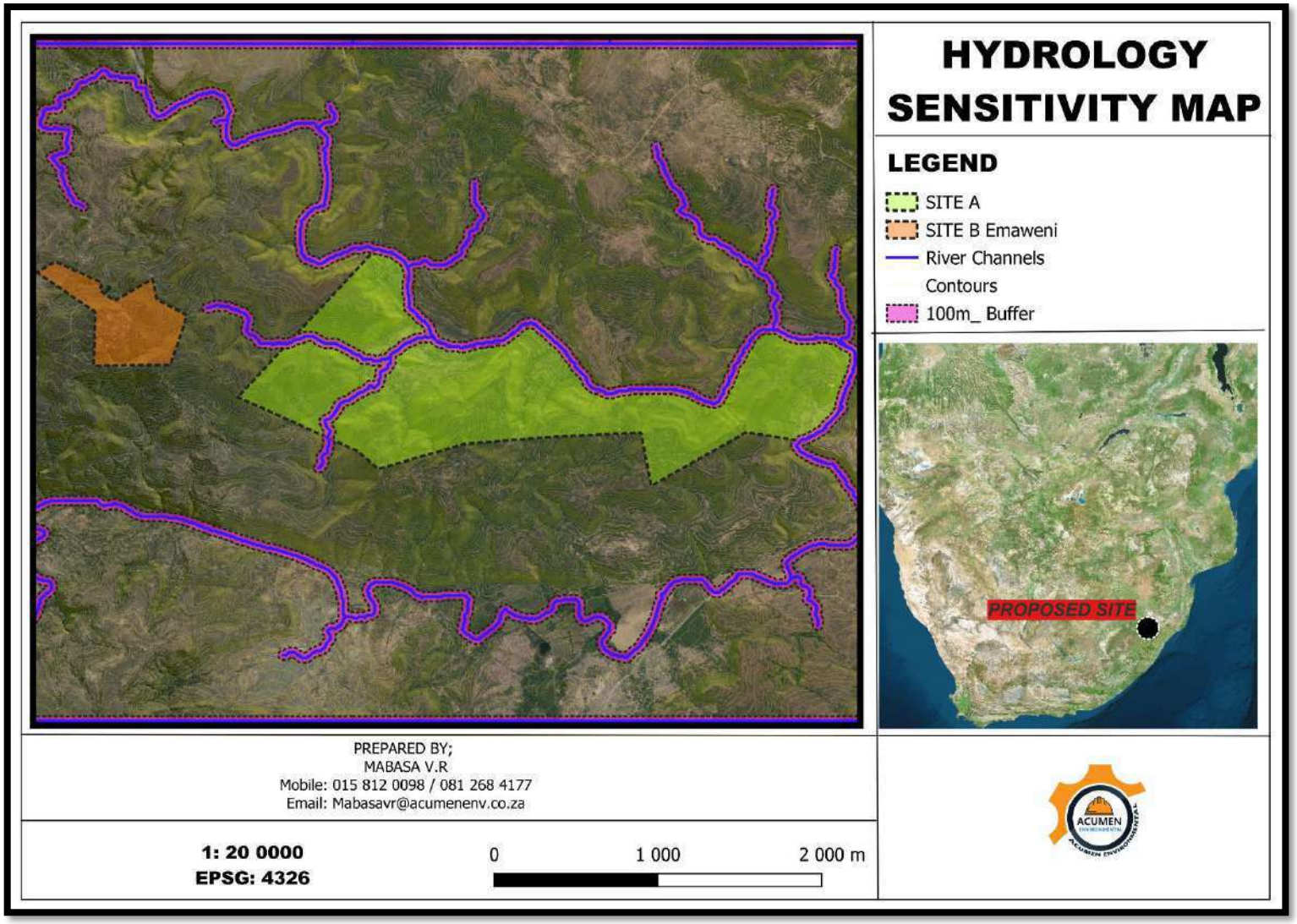

Figure 9: Surface water map.

7. HYDROCENSUS AND BOREHOLE INFORMATION

Boreholes provide valuable information on the groundwater regime. A hydrocensus survey was conducted to verify existing surface and groundwater uses and users, neighbouring borehole locations and depths, spring localities, seepage zones, water levels, abstraction volumes, as well as potential receptors in the vicinity of the site. The hydrocensus extended to approximately 3 Km around the site, except where a river or a surface water body exists.

The hydrocensus did not extend past surface water bodies, such features are usually hydraulically connected to an aquifer and act as a constant-head boundary; and a groundwater pollution plume would theoretically not extend past a constant head boundary. The hydrocensus information is summarised in **Table 1** below, with the corresponding locations in **Figure 9**. No shallow subsoil seepage on the site was evident at the time of the site walk over. No surface water features were observed in the immediate area of the site. The general use of groundwater in the area is human consumption and irrigation.

Table 2: Hydrocensus Data.

ID	LONGITUDE	LATITUDE	BH DEPTH (M)	WATER LEVEL [MBGL]	DISCHARGE [L/S]	WATER USE	DISPLACEMENT(M)	DATE
GROUNDWATER								
2830CA00047	30.09557	-28.69406	60.00	21.00	0.25	Domestic	2231.32	15-10-2024
2830CA00064	30.0882	-28.69117	90.00	40.00	3.33	Domestic	2546.00	15-10-2024
2830CC00064	30.07363	-28.77545	88.39	18.28	1.5	Domestic	2322.61	15-10-2024
2830CC00065	30.07362	-28.77545	86.86	7.62	0.6000	Domestic	2124.12	15-10-2024
2830CA00221	30.04557	-28.74878	66.00	24.00	0.35	Domestic	2315.10	15-10-2024
2830CA00023	30.11407	-28.71384	57.90	24.40	24.40	Domestic	2123.96	15-10-2024

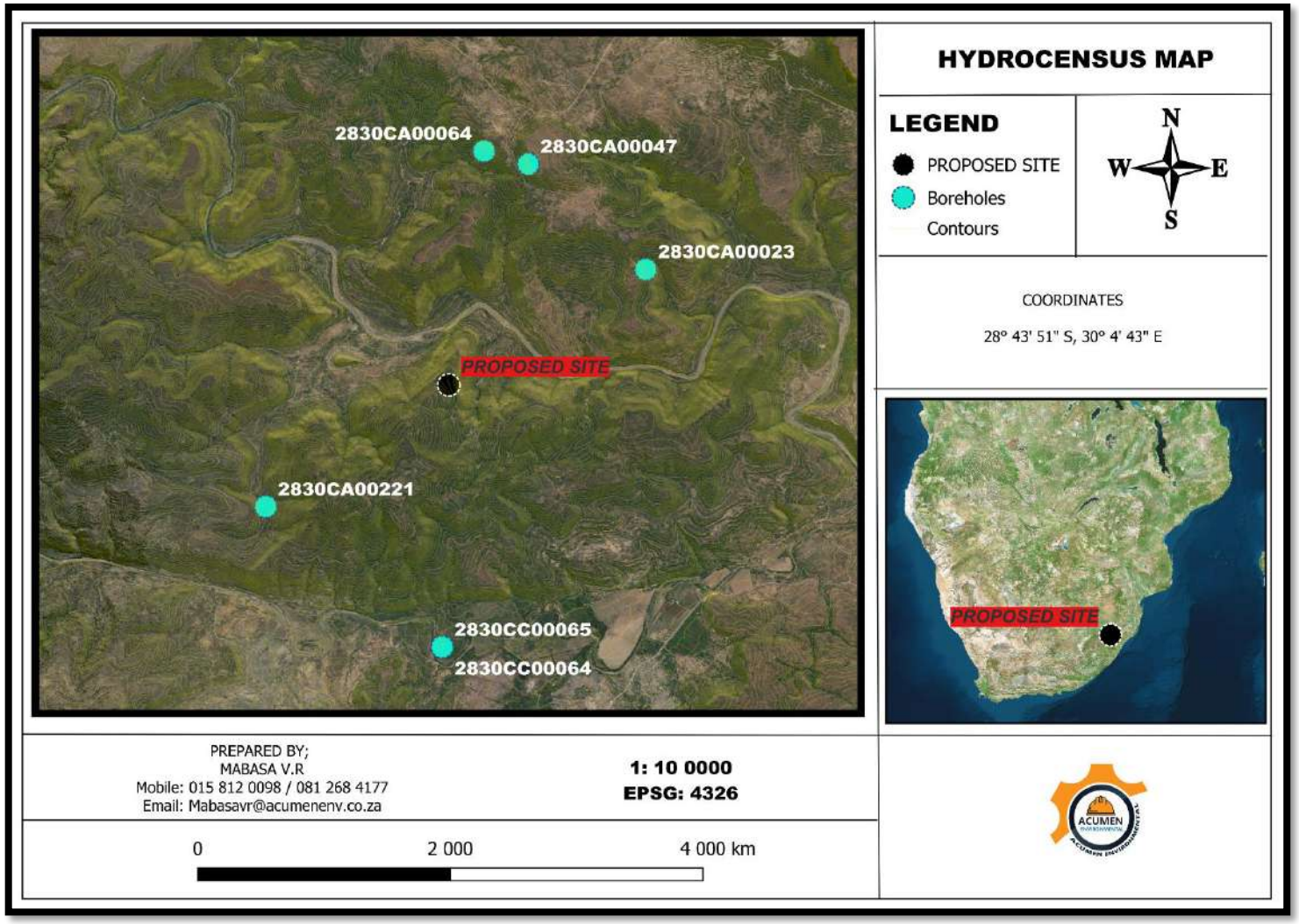

Figure 10: Hydrocensus Map

8. IMPACT IDENTIFICATION

8.1. ASSESSMENT METHODOLOGY

Assessment of impacts was based on the Department of Environmental Affairs (DEA) (1998) Guideline Document: EIA Regulations. The significance of the aspects/impacts of the process is rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process.

This matrix uses the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts. The criteria through which the significance of the impacts was determined is given below **(Table 6 to Table 11).** The significance rating score is calculated as follows:

Significance Rating (SR) = (*extent* + *Intensity* + *Duration*)*x probability*

Table 3: Probability Ratings

PROBABILITY -THIS DESCRIBES THE LIKELIHOOD OF THE IMPACT ACTUALLY OCCURRING	
Improbable	The possibility of the impact occurring is very low, due to the circumstances, design or experience.
Probable	There is a probability that the impact will occur to the extent that provision must be made, therefore.
Highly Probable	It is most likely that the impact will occur at some stage of the development.
Definite	The impact will take place regardless of any prevention plans, and there can only be relied on mitigatory actions or contingency plans to contain the effect.

Table 4: Duration Ratings

DURATION-THE LIFETIME OF THE IMPACT	
Short Term	The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases of the project.
Medium Term	The impact will last up to the end of the phases of the project, where after it will be negated.
Long Term	The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
Permanent	Impact that will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Table 5: Scale Ratings

SCALE-THE PHYSICAL AND SPATIAL SIZE OF THE IMPACT	
Local	The impacted area extends only as far as the activity, e.g. footprint of the project.
Site	The impact could influence the whole, or a measurable portion of the affected properties.
Regional	The impact could affect the area including the neighboring areas.

Table 6: Magnitude/Severity Ratings

MAGNITUDE/ SEVERITY-DOES THE IMPACT DESTROY THE ENVIRONMENT, OR ALTER ITS FUNCTION	
Low	The impact alters the affected environment in such a way that natural processes are not affected.
Medium	The affected environment is altered, but functions and processes continue in a modified way.
High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Table 7:: Significance Ratings

SIGNIFICANCE-THIS IS AN INDICATION OF THE IMPORTANCE OF THE IMPACT IN TERMS OF BOTH PHYSICAL EXTENT AND TIME SCALE, AND THEREFORE INDICATES THE LEVEL OF MITIGATION REQUIRED.	
Negligible	The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.

Low	The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
Moderate	The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
High	The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The matrix that was used for rating and assigning impacts weights is given in Table 15.

Table 8: Rating Matrix Legend for Groundwater Impacts

ASPECT	DESCRIPTION	WEIGHT
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short Term	1
	Medium Term	3
	Long Term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	**Sum (Duration, Scale, Magnitude) x Probability**	
	Negligible	<20
	Low	<40
	Moderate	<60
	High	>60

8.2. IMPACT IDENTIFICATION

It is important that interactions that could lead to potential impacts which may result from the project aspects, or interactions that could lead to potential impacts which may be intensified as a result of the project aspects, be identified (including potential areas of impact). Impact identification is discussed as per project phase (construction, operational and post-operational phase).

8.2.1. CONSTRUCTION PHASE

Impacts envisaged during the construction phase include:

During the inception phase, activities primarily involve exploration, site preparation, and initial construction.

Soil and Vegetation Disturbance:

- Removing vegetation and topsoil during the clearing phase exposes bare soil, which is more susceptible to erosion. When heavy rains occur, exposed soils easily wash into nearby rivers and streams, increasing turbidity and potentially altering riverbed composition.
- High sediment loads can smother aquatic habitats, affecting organisms like fish and macroinvertebrates. These fine sediments may settle downstream, reducing the capacity of rivers and increasing the risk of flooding.

Changes to Surface Water Flow:

- The construction of mining infrastructure such as haul roads, processing facilities, and waste storage areas redirects natural surface water flows. This may lead to channelization, where water is forced to follow unnatural paths, causing localized erosion, flash flooding, or pooling in low-lying areas.
- heavy machinery and road construction often create compacted soils, reducing infiltration rates and increasing surface runoff.

Groundwater Table Alteration

- During initial excavation, dewatering is often required to lower the groundwater table to keep the mine dry. This can significantly lower water levels in the surrounding area, affecting nearby wells, springs, and wetlands that depend on shallow groundwater inputs. This drop may lead to subsidence, where the ground sinks as a result of water removal, potentially impacting buildings or other infrastructure nearby.

Chemical Leaching Risks:

- Exposing rock strata to air and water begins the oxidation process, especially if pyrite or other sulfide minerals are present. The oxidation of these minerals can lead to the formation of sulfuric acid, which may start leaching trace metals like iron, manganese, and even arsenic into groundwater. Though usually limited in the construction phase, leaching risk grows as exposure increases.

8.2.2. OPERATIONAL PHASE

Impacts envisaged during the operational phase include:

During the operational phase, the mine is fully active, extracting and processing diamonds.

Acid Mine Drainage (AMD):

- The operational phase is the peak time for AMD formation. Pyrite and other sulfides in the rock react with oxygen and water, forming sulfuric acid that seeps into groundwater and surface water systems.
- The acidic water mobilizes metals such as iron, aluminum, copper, and zinc, which can be toxic to aquatic life and unsafe for human use. AMD can persist for decades or centuries, making it one of the most challenging impacts to mitigate.

Increased Sediment Load:

- Constant blasting, excavation, and processing generate loose material and fine sediment, which runoff can carry into streams and rivers.
- Elevated sediment loads cause siltation, which can reduce oxygen levels in water, clog fish gills, bury spawning beds, and reduce photosynthesis for aquatic plants. Additionally, sedimentation alters channel morphology, affecting the natural course of rivers and increasing erosion downstream.

Lowering of Groundwater Levels:

- To maintain dry conditions in open pits or underground workings, extensive pumping is required, often lowering the regional groundwater table by tens or even hundreds of meters.
- Depletion can cause wells to run dry, impacting local water supplies, agriculture, and even hydrologically connected surface waters like rivers or wetlands. Nearby vegetation and ecosystems dependent on shallow groundwater may suffer as soil moisture decreases.

Discharge of Contaminated Water:

- During coal washing and preparation, significant volumes of water containing suspended solids, dissolved salts, and trace metals are generated. If this water is inadequately treated and discharged into nearby rivers or infiltrates groundwater, it can degrade water quality.
- Contaminants like salts, metals, and hydrocarbons may affect drinking water supplies, alter soil chemistry, and be toxic to aquatic life.

Loss of Wetlands and Riparian Areas:

- Dewatering and sedimentation can damage wetlands, which are sensitive to changes in water availability and quality.
- Wetlands serve as natural water filters and habitat for diverse species; their loss reduces local biodiversity, decreases groundwater recharge, and can increase flooding downstream.

8.2.3. POST-OPERATIONAL PHASE

Impacts envisaged during the post operational phase include:

During the decommissioning phase, the mine is closed, and activities focus on site rehabilitation and environmental restoration.

Water Table Recovery and Seepage Issues:

- After mining ceases and dewatering stops, groundwater levels gradually recover. As the water table rises, it can interact with contaminated mine voids and waste dumps, leading to contaminated seepage into surrounding surface and groundwater.
- Seepage can introduce AMD or other pollutants into nearby streams and aquifers, even long after the mine is closed.

Residual Acid Mine Drainage:

- AMD generation does not stop after mining ends. Exposure of sulfide-bearing materials to air and water can continue, sometimes worsening as abandoned mine voids fill with water.

Erosion and Sediment Control Challenges:

- Mine sites may have altered landscapes, including exposed slopes, waste rock piles, and recontoured land. Without stabilizing vegetation or engineering controls, these areas can remain susceptible to erosion.
- Poor erosion control can allow large quantities of sediment to continue flowing into water bodies, prolonging water quality issues.

Altered Surface Flow Patterns and Drainage:

- Changes made to the landscape, such as altered drainage channels and retention ponds, can become semi-permanent, leading to shifts in natural drainage patterns. Rehabilitated areas may have less infiltration and increased runoff, causing flash floods in surrounding areas or altering downstream flows.

Long-term Contamination and Legacy Pollutants:

- Contaminants such as heavy metals and hydrocarbons often persist in rehabilitated sites, especially if soil and rock material remains exposed. These pollutants can leach slowly into water over decades, posing ongoing risks to water quality.

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Table 9: Hydrological Impacts

Mining Phase	Hydrological Impact	Description
Construction Phase	*Soil and Vegetation Disturbance*	• Clearing vegetation and topsoil increases erosion and sedimentation, leading to increased turbidity in nearby streams and smothering of aquatic habitats.
	Changes to Surface Water Flow	• Infrastructure construction alters runoff patterns, causing localized erosion, pooling, and potential flooding due to compacted soils.
	Groundwater Table Alteration	• Initial excavation and dewatering lower groundwater levels, impacting wells, springs, and dependent wetlands and possibly leading to ground subsidence.
	Chemical Leaching Risks	• Exposure of sulfide minerals to air and water initiates oxidation, which can leach trace metals like iron and manganese into groundwater.
Operational Phase	*Acid Mine Drainage (AMD)*	• Oxidation of pyrite creates sulfuric acid, mobilizing metals (e.g., iron, aluminum, copper) and leading to toxic contamination in groundwater and rivers.
	Increased Sediment Load	• Excavation and blasting increase sediment runoff, clogging streams, reducing oxygen, and altering habitats and river channel morphology.
	Lowering of Groundwater Levels	• Continuous dewatering lowers the regional water table, affecting nearby wells, reducing water supplies, and impacting vegetation and ecosystems.
	Discharge of Contaminated Water	• Coal washing produces contaminated effluents with suspended solids, salts, and metals that can degrade water quality in nearby rivers.

	Loss of Wetlands and Riparian Areas	• Dewatering and sedimentation damage wetlands, reducing biodiversity, groundwater recharge, and increasing downstream flooding risks.
Rehabilitation Phase	*Water Table Recovery and Seepage Issues*	• Post-mining water table recovery can bring contaminated water to the surface, affecting nearby waterways with AMD and other pollutants.
	Residual Acid Mine Drainage	• AMD continues post-closure, potentially worsening as voids fill with water, requiring ongoing treatment systems to manage acidity and metal leaching.
	Erosion and Sediment Control Challenges	• Altered landscapes may remain susceptible to erosion, allowing continued sediment flow into water bodies if not stabilized with vegetation or structures.
	Altered Surface Flow Patterns and Drainage	• Permanent changes to topography and drainage patterns increase flood risks and alter downstream flows; may need channel restoration.
	Long-term Contamination and Legacy Pollutants	• Persistent contaminants leach into water over time, requiring monitoring and bioremediation to prevent degradation of water resources.
		•

9. MANAGEMENT AND MITIGATION

This sub-section presents mitigation measures and/or enhancement measures for the identified impacts to be implemented either at the construction phase or operational phase.

9.1. CONSTRUCTION PHASE

The following mitigation measures are recommended for the construction phase:

During the inception phase, the primary activities include exploration drilling, land clearing, and construction of infrastructure. To mitigate hydrological impacts:

During the construction phase, coal mining activities can lead to soil and vegetation disturbance, changes to surface water flow, groundwater table alteration, and chemical leaching. Mitigation measures are essential to manage these impacts effectively:

Soil and Vegetation Disturbance:

- Install erosion control structures, such as silt fences, erosion blankets, and sediment traps.
- Conduct phased clearing by limiting vegetation removal to small, active areas and reseed cleared areas promptly with native plants to reduce exposed soil.

Changes to Surface Water Flow:

- Build diversion channels and ditches to direct runoff away from construction zones and prevent pooling.
- Use stormwater ponds to capture runoff, reduce peak flow rates, and allow sediment settling.

Groundwater Table Alteration:

- Practice controlled dewatering to avoid excessive water table changes and reinject water where feasible.
- Install groundwater monitoring wells around the construction site to detect any drops that may affect local water supplies or ecosystems.

Chemical Leaching Risks:

- Cover exposed rock with chemical sealants or protective layers to reduce oxidation and leaching. Set up early leachate monitoring stations around excavation areas to detect and respond to any chemical leaching promptly

9.2. OPERATIONAL PHASE

In the operational phase, when the mine is fully active, the focus is on managing groundwater extraction, surface water usage, tailings and waste, and controlling erosion and sedimentation:

Acid Mine Drainage (AMD):

- Establish water treatment facilities, such as lime treatment or constructed wetlands, to neutralize AMD and remove heavy metals.
- preventative barriers like impermeable liners or clay barriers in waste storage areas to prevent acid leachate from contaminating groundwater.

Increased Sediment Load:

- Construct settling ponds and silt fences to capture sediment from runoff and prevent it from entering nearby water bodies.
- Stabilize soil using riprap (rock material) and fast-growing vegetation to reduce erosion and sedimentation.

Lowering of Groundwater Levels:

- Minimize dewatering to avoid excessive lowering of the water table and reinject water where possible.
- Provide alternative water sources, such as drilled wells, for communities affected by water table changes and monitor levels continuously.

Discharge of Contaminated Water:

- Treat effluent from coal washing to remove solids, salts, and trace metals before environmental discharge.
- Use closed-loop water systems to recycle process water, reducing the likelihood of contaminated discharge leaving the site.

Loss of Wetlands and Riparian Areas:

- Establish buffer zones around wetlands to prevent disturbance from mining activities.
- Monitor water levels in nearby wetlands and supplement them as needed to mitigate dewatering impacts.

9.3. POST-OPERATIONAL PHASE

The following is recommended for the post-operational phase:

During the decommissioning phase, activities focus on site rehabilitation and environmental restoration to mitigate long-term hydrological impacts:

Water Table Recovery and Seepage Issues:

- Install seepage collection systems around reclaimed areas to capture and treat contaminated seepage.
- Implement long-term water quality monitoring near the rehabilitated site to detect contamination issues.

Residual Acid Mine Drainage:

- Use passive treatment systems like constructed wetlands, bioreactors, or limestone drains for ongoing AMD treatment.
- Plan for perpetual monitoring and treatment, as AMD can persist long after mining activities have ceased.

Erosion and Sediment Control Challenges:

- Replant native grasses, shrubs, and trees to stabilize soil and prevent erosion.
- Reshape land to natural contours and install riprap on slopes to control erosion effectively.

Altered Surface Flow Patterns and Drainage:

- Restore natural stream channels and wetlands to recreate pre-mining hydrology.
- Apply hydraulic engineering to manage post-rehabilitation water flow and prevent flooding.

Long-term Contamination and Legacy Pollutants:

- Conduct regular soil and water testing to monitor for slow-leaching contaminants and adapt remediation efforts as needed.
- Use phytoremediation and bioremediation methods, including plants and bacteria, to enhance ecological recovery by removing contaminants.

Additional Measures Across All Phases

Across all phases, certain ongoing measures help manage and respond to hydrological impacts:

- **Continuous Monitoring**: Regularly test water quality to detect potential contamination early and adjust mitigation measures accordingly.
- **Community Engagement**: Engage local communities on water quality and availability impacts and provide alternative water sources if required.
- **Adaptive Management**: Use real-time monitoring data to adjust mitigation efforts and respond to unforeseen hydrological impacts promptly.

Table 10: Impact Assessment Summary

Mining Phase	Hydrological Impact	Mitigation Measures
Construction Phase	*Soil and Vegetation Disturbance*	• **Erosion Control Structures**: Install silt fences, erosion blankets, and sediment traps to prevent soil erosion. • **Phased Clearing**: Limit vegetation clearing to small, active areas to reduce exposed soil and reseed cleared areas with native plants as soon as possible.
	Changes to Surface Water Flow	• **Diversion Channels and Ditches**: Construct channels and ditches around the site to redirect runoff away from construction areas and minimize pooling. • **Stormwater Ponds**: Set up stormwater ponds to capture runoff, reduce peak flow rates, and allow sediment to settle before release.
	Groundwater Table Alteration	• **Controlled Dewatering**: Plan and time dewatering carefully to avoid excessive water table lowering; consider reinjection of water where possible to maintain groundwater levels. • **Groundwater Monitoring Wells**: Install wells around the construction site to monitor changes in groundwater levels and identify any significant drops that may affect local wells or ecosystems.
	Chemical Leaching Risks	• **Covering Exposed Rock**: Apply chemical sealants or covers to sulfide-rich materials to reduce oxidation and leaching into groundwater. • **Early Leachate Monitoring**: Install monitoring stations around excavated areas to detect any initial chemical leaching and respond quickly if detected.

Operational Phase	*Acid Mine Drainage (AMD)*	• **Water Treatment Facilities**: Set up active treatment plants (e.g., lime treatment) or passive treatment systems (e.g., wetlands) to neutralize AMD and remove heavy metals before water is discharged. • **Preventative Barriers**: Use impermeable liners or clay barriers in waste storage areas to prevent acid leachate from seeping into groundwater.
	Increased Sediment Load	• **Settling Ponds and Silt Fences**: Construct settling ponds or silt fences to capture sediment runoff from the mine site and prevent it from entering streams. • **Riprap and Vegetation Stabilization**: Use riprap (rock material) and fast-growing vegetation to stabilize disturbed soil and prevent erosion and sedimentation.
	Lowering of Groundwater Levels	• **Reduced Dewatering**: Minimize dewatering to avoid excessive lowering of the water table and reinject extracted water where feasible. • **Alternative Water Supplies**: Provide alternative water sources (e.g., drilled wells) for affected communities, with continuous monitoring of local water levels.
	Discharge of Contaminated Water	• **Effluent Treatment**: Ensure all discharge from coal washing and processing is treated to remove suspended solids, salts, and trace metals before entering the environment. • **Closed-Loop Water Systems**: Utilize closed-loop systems to recycle process water, reducing the risk of contaminated discharge leaving the site.
	Loss of Wetlands and Riparian Areas	• **Protective Buffers**: Establish buffer zones around wetlands to minimize disturbance from mining activities. • **Water Level Management**: Monitor water levels in nearby wetlands and supplement water as needed to offset dewatering impacts.

Rehabilitation Phase	*Water Table Recovery and Seepage Issues*	• **Seepage Collection**: Install collection systems around reclaimed areas to capture and treat contaminated seepage before it can reach surface water bodies. • **Water Quality Monitoring**: Implement long-term monitoring of surface and groundwater near the rehabilitated site to detect any contamination issues.
	Residual Acid Mine Drainage	• **Passive Treatment Systems**: Use constructed wetlands, bioreactors, or limestone drains for ongoing passive treatment of AMD. • **Perpetual Monitoring and Treatment**: Maintain treatment and monitoring for decades, as AMD can persist long after mining ceases.
	Erosion and Sediment Control Challenges	• **Revegetation with Native Species**: Plant native grasses, shrubs, and trees to stabilize soil and prevent erosion. • **Contour Land Shaping and Riprap Installation**: Reshape land to natural contours and install riprap to stabilize slopes and prevent erosion.
	Altered Surface Flow Patterns and Drainage	• **Stream and Wetland Restoration**: Recreate natural stream channels and wetlands to restore hydrology and improve water quality. • **Hydraulic Engineering**: Use hydraulic models and engineered drainage structures to manage post-rehabilitation water flow effectively.
	Long-term Contamination and Legacy Pollutants	• **Ongoing Soil and Water Testing**: Conduct regular testing to monitor for slow-leaching contaminants, adapting remediation efforts as needed. • **Phytoremediation and Bioremediation**: Use plants and bacteria to help remove contaminants, enhancing ecological recovery.
Additional Measures Across All Phases	*Continuous Monitoring*	• Conduct regular water quality testing to detect potential contamination early and adjust mitigation measures accordingly.

	Community Engagement	• Engage with local communities on water quality and availability impacts, providing alternative water sources if required.
	Adaptive Management	• Use real-time monitoring data to adjust mitigation efforts and address unforeseen hydrological impacts promptly.

10. FLOODLINE DELINEATION

Flood calculations were conducted for the catchment area to quantify the discharging volumes.

10.1. METHODOLOGY

The following section outlines the methodology that was implemented for flood line delineation, specifically:

- A desktop study which was conducted to gather catchment physiographic and the climatic data of the proposed area.
- The deterministic methods to be employed, The Rational Method was the most appropriate for this size of catchment.
- Using the design flood peak flows, the flood lines were modelled in HECRAS.

10.2. Rational Method

The Rational Method is a widely used approach for estimating peak stormwater runoff rates and designing drainage systems. QGIS is a Geographic Information System (GIS) software, and HEC-RAS is a hydraulic modeling software used for river and floodplain analysis. Here's a general methodology for using QGIS and HEC-RAS in conjunction with the Rational Method for flood determination:

Data Collection and Preparation:

- Obtain a Digital Elevation Model (DEM) for the study area, which provides elevation data.
- Acquire land use/land cover data, soil data, and rainfall intensity data for the area.
- Import the DEM and other necessary spatial data into QGIS.

Rainfall Intensity and Time of Concentration:

- Determine the design rainfall intensity for the desired return period (e.g., 25-year, 50-year, 100-year storm).
- Calculate the time of concentration (Tc) for each sub-catchment in the study area. Tc represents the time it takes for runoff to travel from the farthest point in a drainage area to the outlet.

Runoff Coefficient:

- Assign runoff coefficients to different land use/land cover classes using available literature or local standards. These coefficients represent the portion of rainfall that becomes runoff.
- Calculate the area-weighted average runoff coefficient for each sub-catchment.

Calculation of Peak Runoff Rate (Q):

- Use the Rational Method equation: Q = Ci * A, where Ci is the runoff coefficient and A is the drainage area.
- Calculate the peak runoff rate for each sub-catchment.

Sub-catchment Delineation:

- Use QGIS to delineate the study area into sub-catchments based on natural drainage divides. Divide the area into smaller units with similar characteristics.

Hydraulic Modeling with HEC-RAS:

- Set up a hydraulic model in HEC-RAS to represent the river or channel network within the study area.
- Define cross sections and river reaches in HEC-RAS based on available data or field surveys.

Importing Rational Method Results to HEC-RAS:

- In QGIS, associate each sub-catchment with the corresponding HEC-RAS river reach or node.
- Export the Rational Method results (peak runoff rates) from QGIS and import them into HEC-RAS.

Hydraulic Analysis and Flood Modeling:

Run the HEC-RAS hydraulic model using the Rational Method peak runoff rates.

- Simulate the flow conditions for the selected return period and analyze the resulting flood extent, water depths, velocities, etc.

Model Calibration and Validation:

- Calibrate the HEC-RAS model by comparing the simulated results with observed data (if available) to ensure the model accurately represents the actual flood conditions.

Results and Design:

- Analyze the flood modeling results to assess potential flood risks and impacts.
- Use the hydraulic model to design and evaluate flood mitigation measures, such as channel improvements, levees, or stormwater management practices.

10.3. CONTRIBUTING CATCHMENT DETAILS

The characteristics of a catchment play an important role in the determination of flood peaks. Steep slopes cause water to move faster and to shorten the critical time of the flood causing storm, thus increasing rainfall intensities in the runoff formulae.

The South African Weather Service was consulted to retrieve hydrologic and climatic data of the primary catchment. Historic data for SAWS Station which is in PLOOYSBURG I was used for this assessment. The details of the South African Weather Service station that provided Rainfall and Evaporation information are given below.

Table 11: Weather Station

Station Name SAWS Distance Record	Lat	itude	Long	itude	MAP A	ltitude	Durati	on	Return	Period (y	ears)			
Number (km) (Years)	(−)	(')	(−)	(')	(mm)	(m)	(m/h/	d)	50	50L	50U	100	100L	100U
PLOOYSBURG **0257391_W**	28	34	30	4	665	1070	1	d	132.1	131.0	133.2	147.0	145.4	148.5

Table 12: Catchment Characteristics.

Catchment Area	167.364 km²
Longest Watercourse	31.78 km
Average Slope	0.00449 mm
Time of Concentration	0.11853 hours
Q100	22 486.04 m³/s
Mean annual precipitation	665 mm

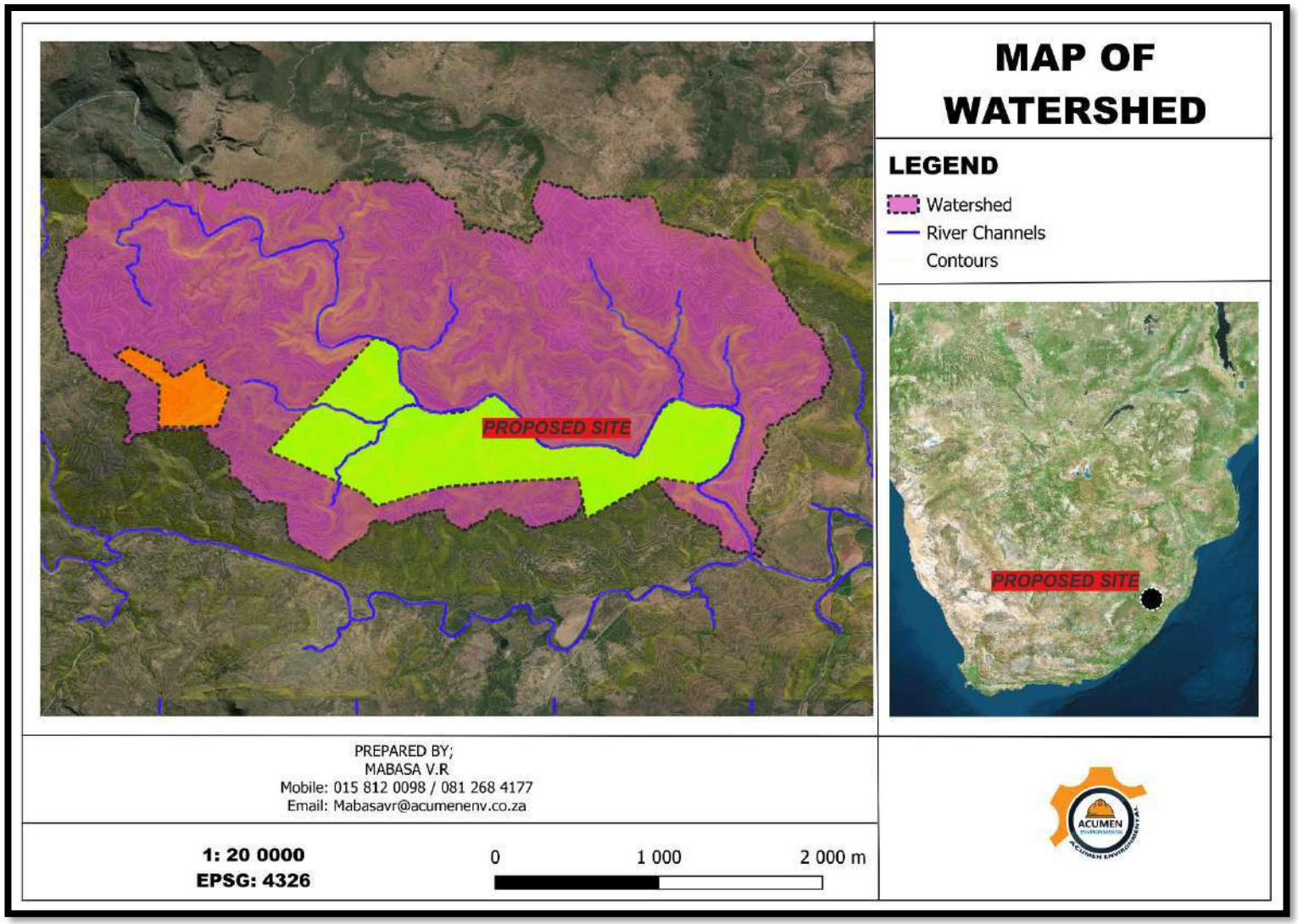


Figure 11: Catchment Delineation

10.4. RESULTS

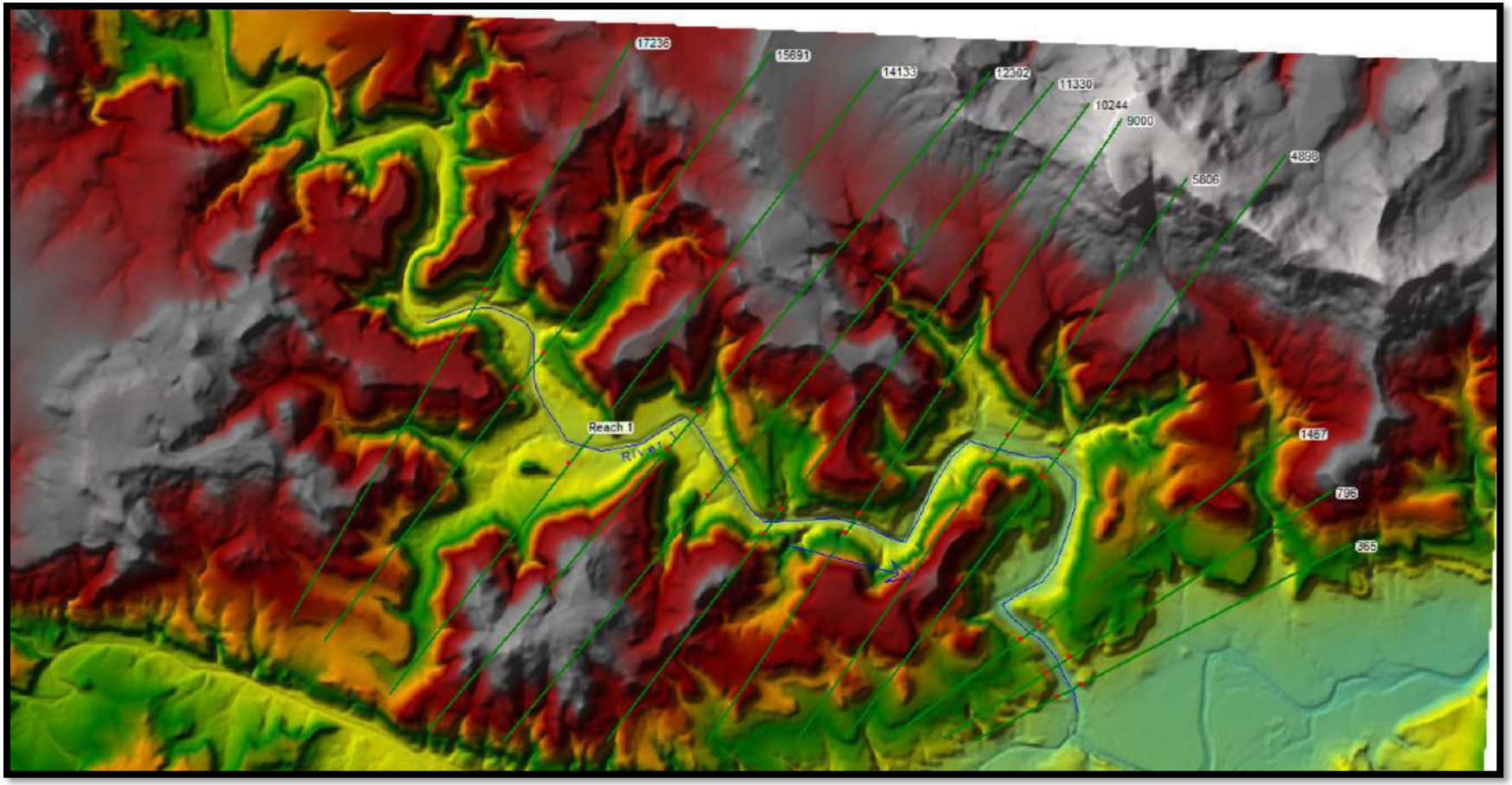


Figure 12: River Geometry

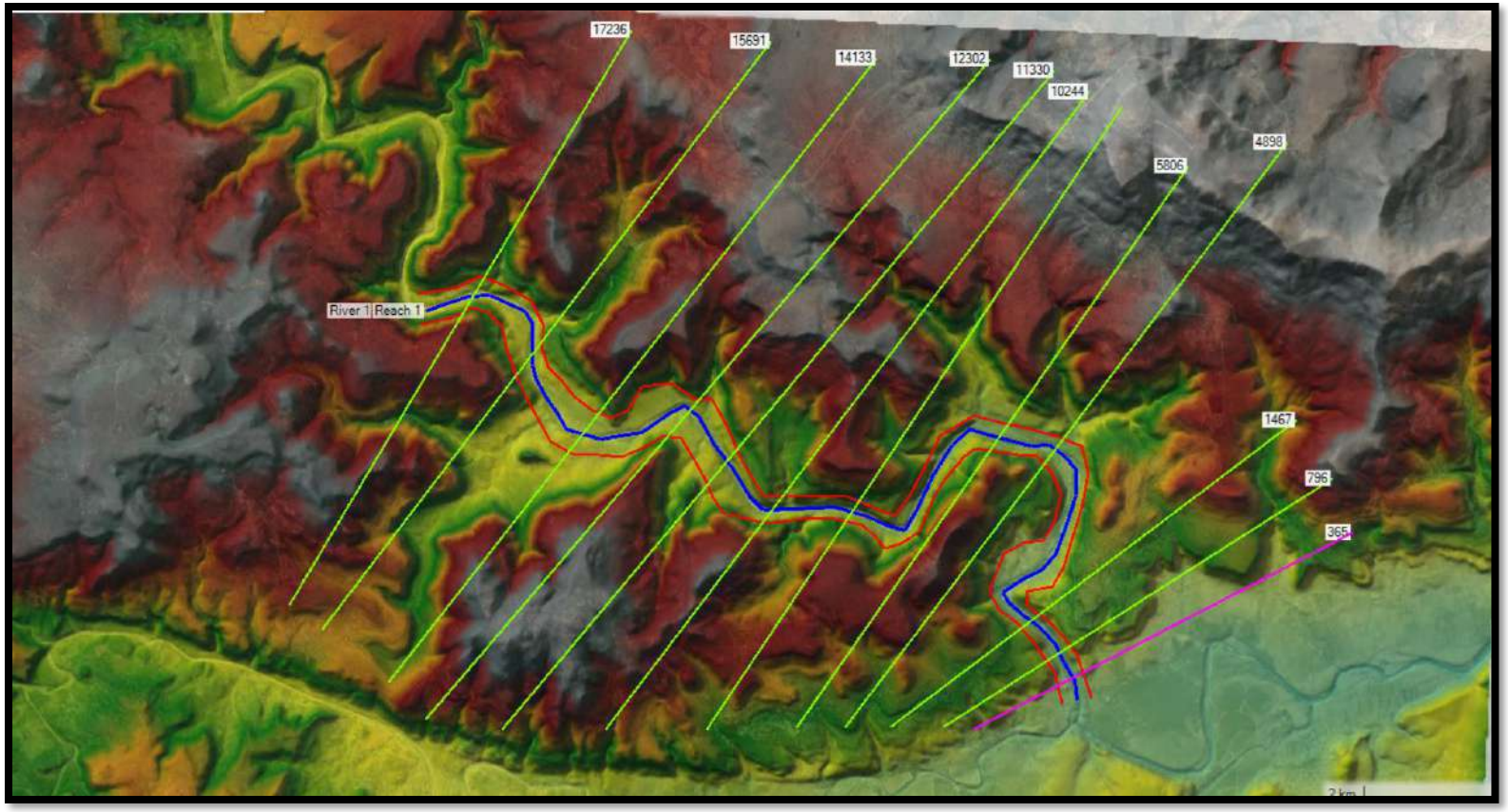


Figure 13: River Cross section.

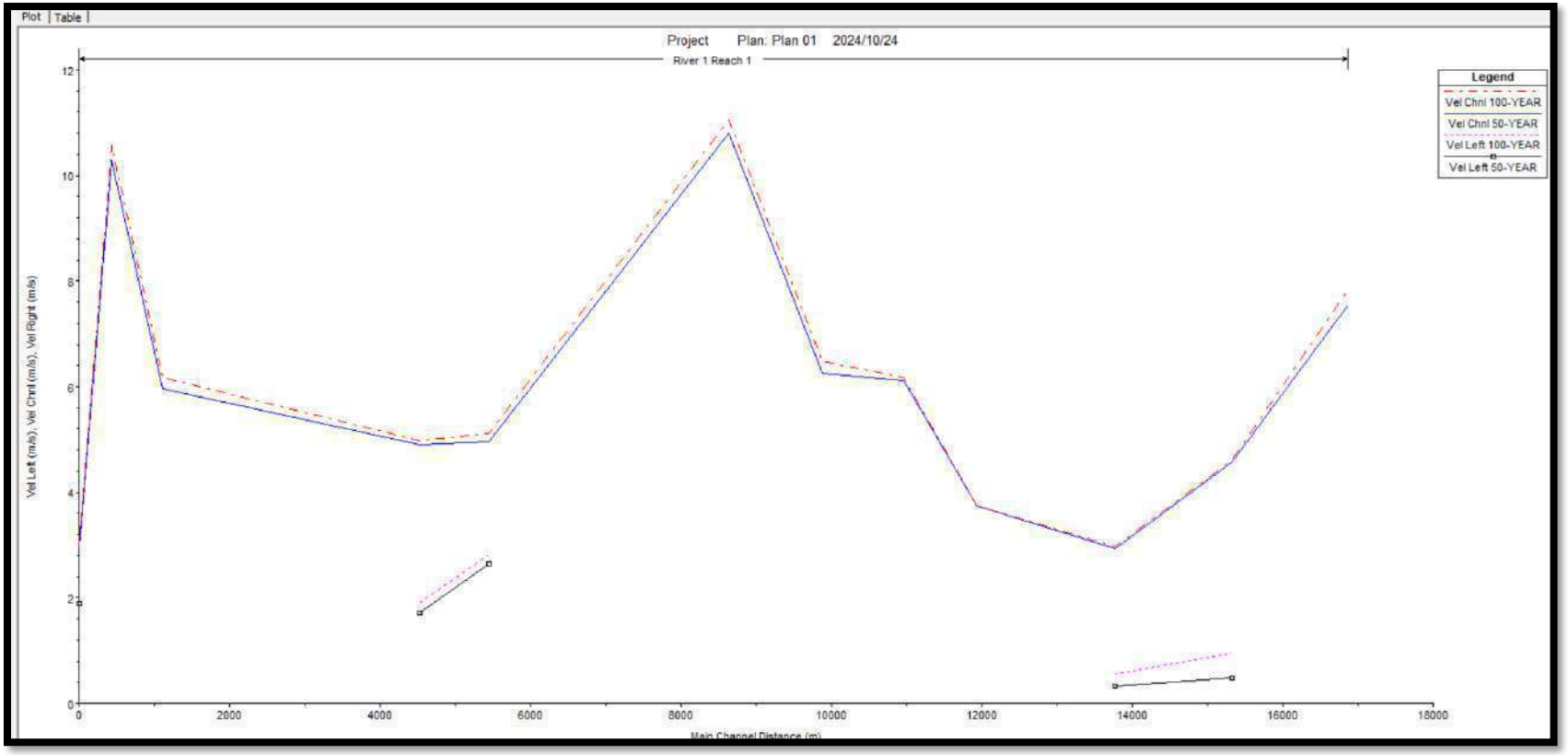


***Figure 14**: River Cross Section*

Cross Section Output

File Type Options Help

River: River 1 Profile: 50-YEAR

Reach Reach 1 RS: 17236 Plan: flow

Plan: flow River 1 Reach 1 RS: 17236 Profile: 50-YEAR

		Element	Left OB	Channel	Right OB
E.G. Elev (m)	713.00				
Vel Head (m)	2.90	Wt. n-Val.		0.050	
W.S. Elev (m)	710.11	Reach Len. (m)	1545.50	1545.50	1545.50
Crit W.S. (m)		Flow Area (m2)		2680.49	
E.G. Slope (m/m)	0.005516	Area (m2)		2680.49	
Q Total (m3/s)	20206.00	Flow (m3/s)		20206.00	
Top Width (m)	230.62	Top Width (m)		230.62	
Vel Total (m/s)	7.54	Avg. Vel. (m/s)		7.54	
Max Chl Dpth (m)	16.27	Hydr. Depth (m)		11.62	
Conv. Total (m3/s)	272061.2	Conv. (m3/s)		272061.2	
Length Wtd. (m)	1545.50	Wetted Per. (m)		234.47	
Min Ch El (m)	693.84	Shear (N/m2)		618.41	
Alpha	1.00	Stream Power (N/m s)		4661.64	
Frctn Loss (m)	4.89	Cum Volume (1000 m3)	2209.94	65082.38	
C & E Loss (m)	0.55	Cum SA (1000 m2)	581.74	5261.55	

Figure 15: Output Table

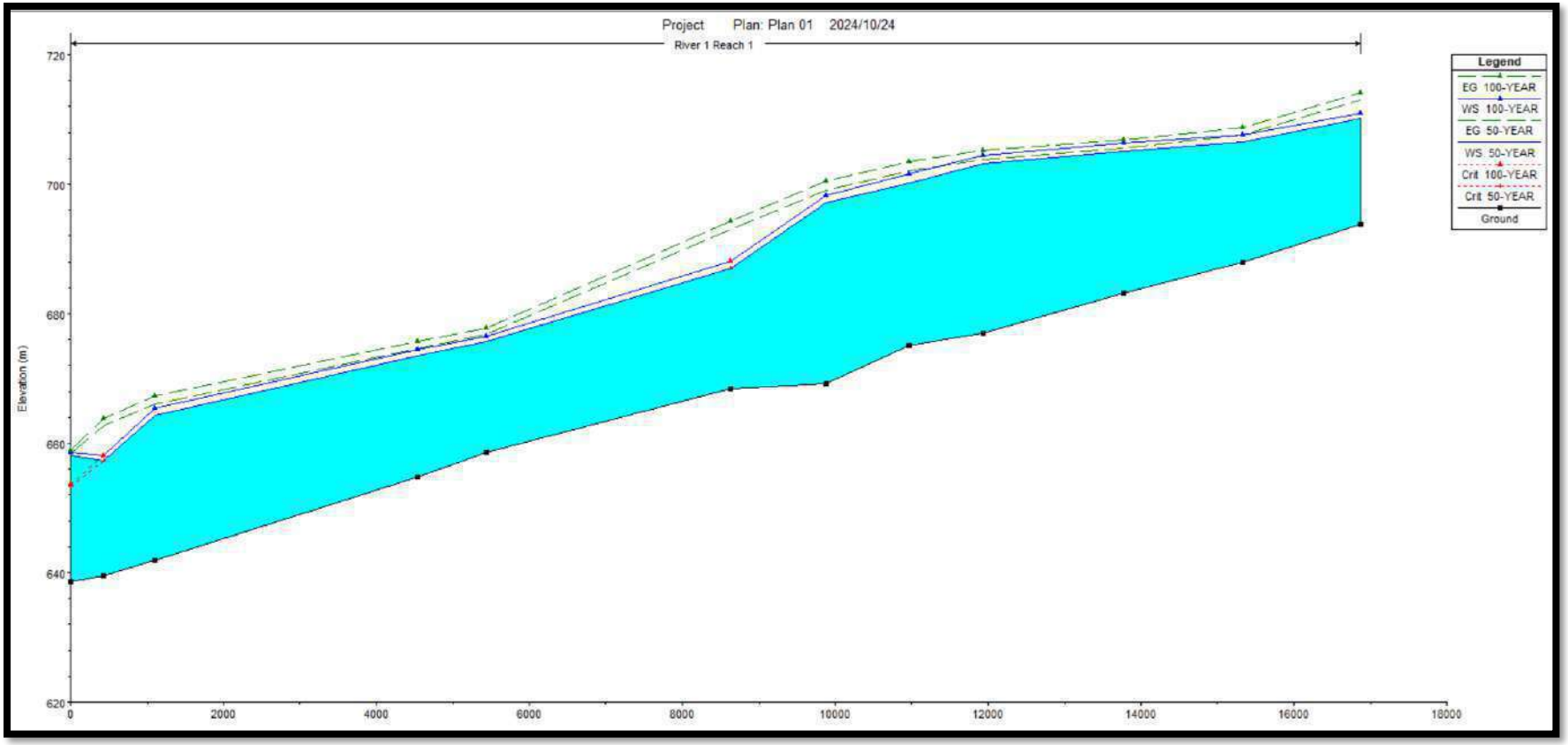


Figure 16: Results Table

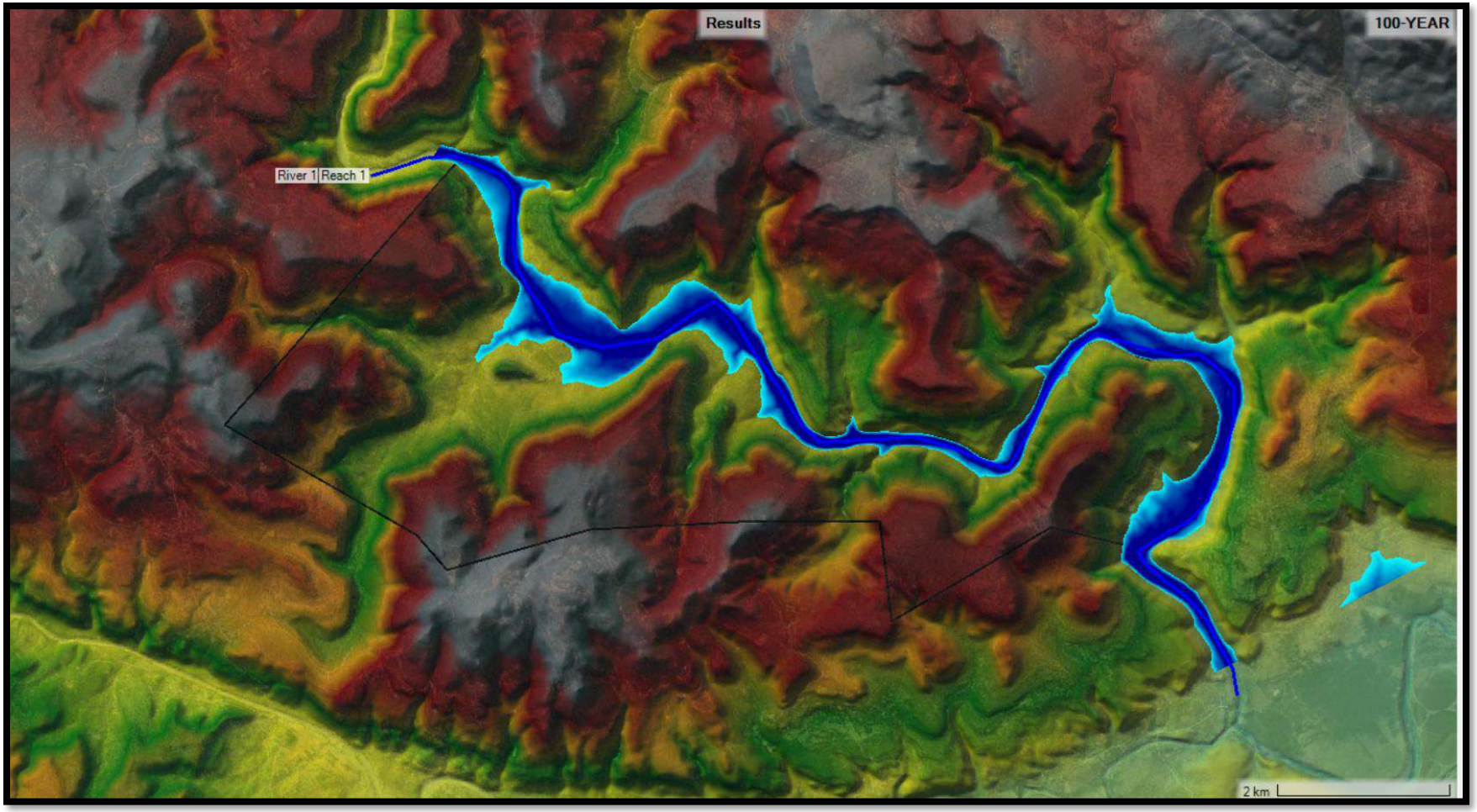
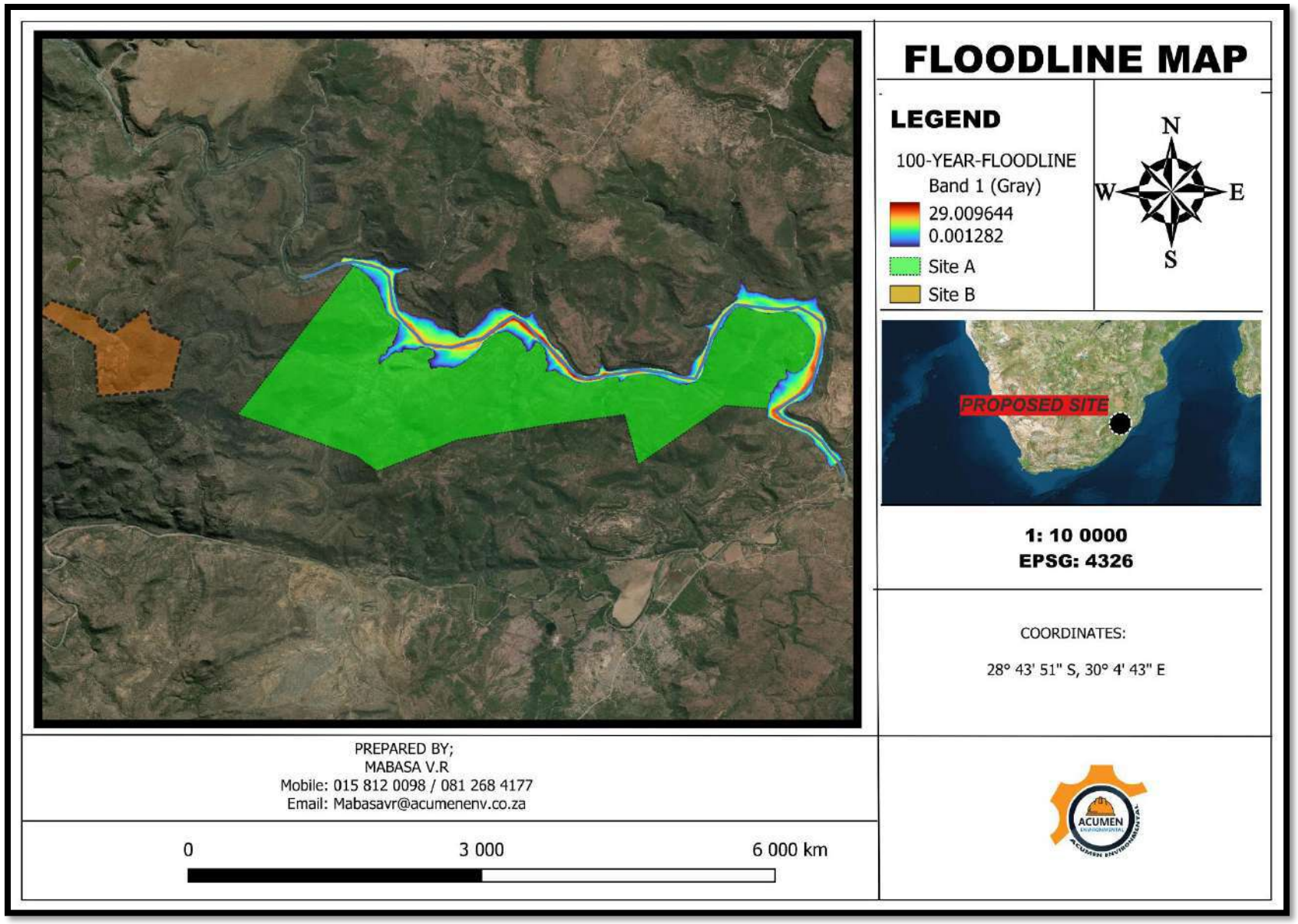


Figure 17: Floodline


FLOODLINE MAP
LEGEND
100-YEAR-FLOODLINE
Band 1 (Gray)
29.009644
0.001282
Site A
Site B
N
W
E
S
PROPOSED SITE
1: 10 0000
EPSG: 4326
COORDINATES:
28° 43' 51" S, 30° 4' 43" E
PREPARED BY;
MABASA V.R
Mobile: 015 812 0098 / 081 268 4177
Email: Mabasavr@acumenenv.co.za
0
3 000
6 000 km

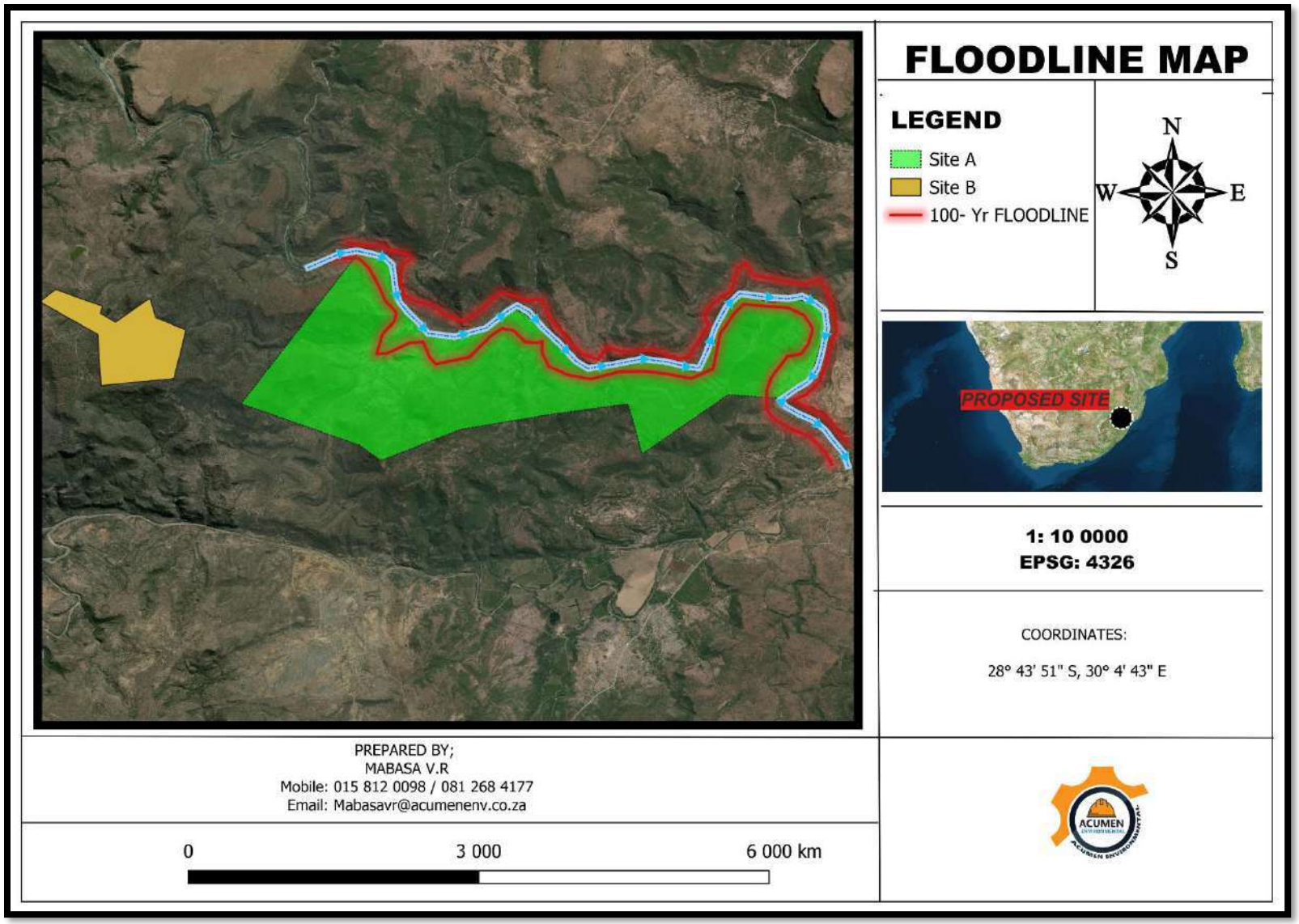


Figure 18: Floodline Map

11. CONCLUSIONS AND RECOMMENDATIONS

By September 2024 Acumen Environmental (Pty) Ltd was appointed by Vahlengwe Advisory to conduct a hydrological investigation for the proposed prospecting right application for Coal in respect of Farm Lotmga 8761 Gt, Farm Kaisha 14719 Gt, Farm Osaka 12977 Gt, Farm Krompoort 2155 Gt and Farm Ravine 9201 Gt in the Estcourt Magisterial District, Kwazulu-Natal Province.

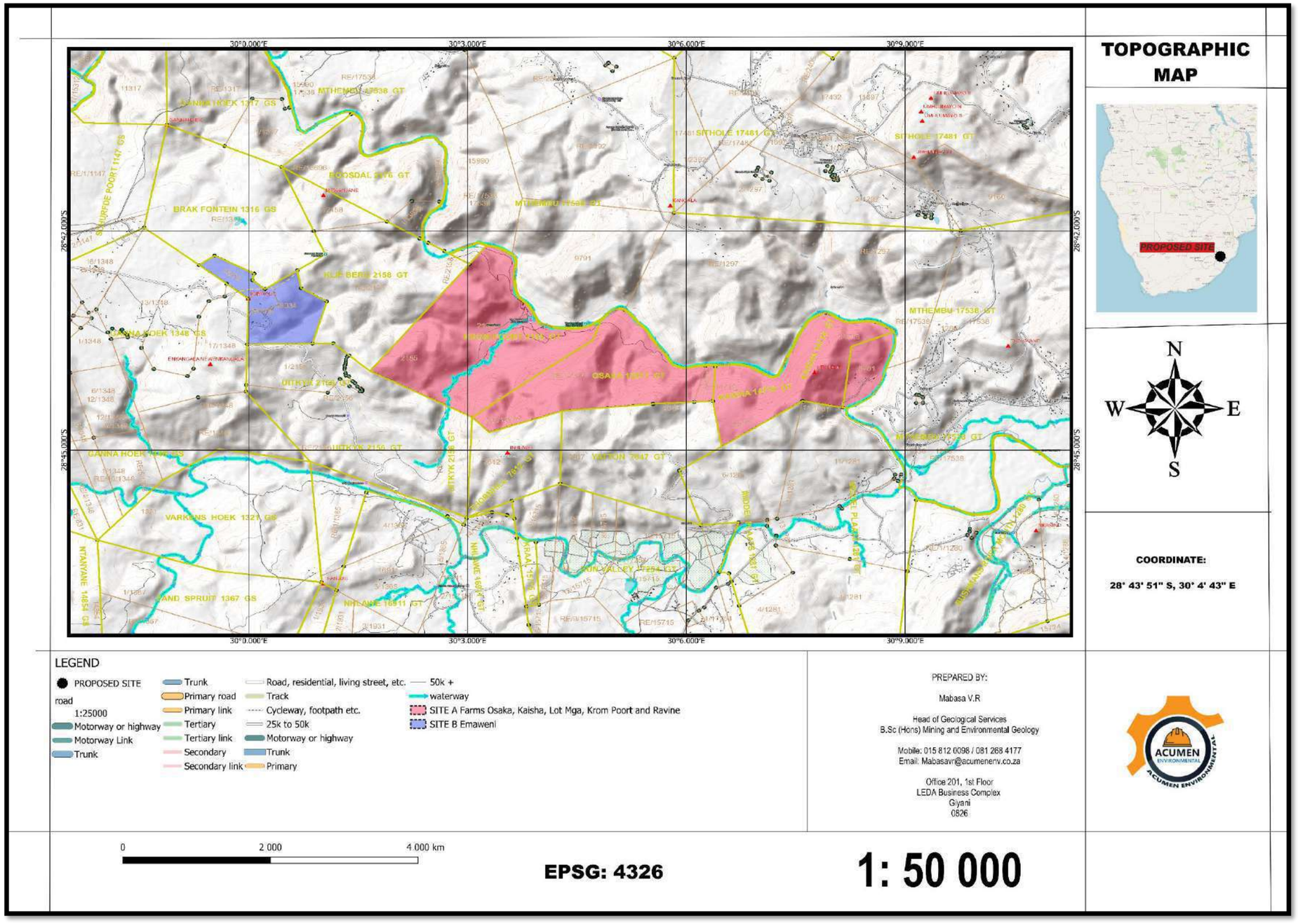
The floodlines represent the calculated conditions possible during the 1:100-year return period floods as it assumed that the storm would occur over the full catchment and the stream will convey a peak flood. The nearest river systems that could cause a potential 1: 100-Year flood ***do not encroach on the floodline on the majority of the site except where "solid Red lines" are indicated, and development should be avoided in such areas. Development should proceed as intended.***

12. REFERENCES

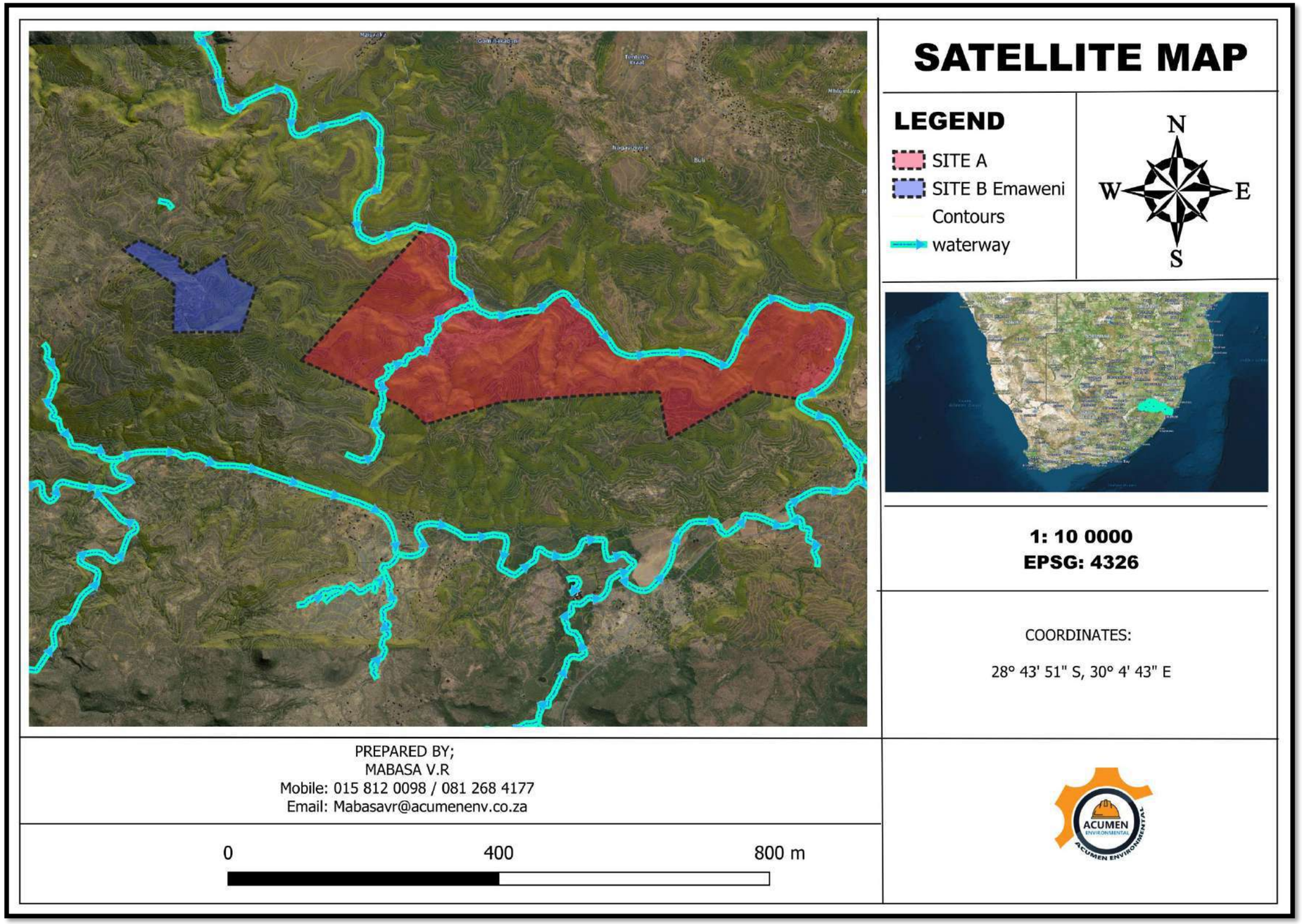
1) BUSH RA (1989) A Geohydrological Assessment of the Swartwater and Beauty Areas, Northern Western Transvaal. Report No. GH 3577. Directorate of Geohydrology, Department of Water Affairs and Forestry, Pretoria, South Africa.
2) Department of Water Affairs (2012): Aquifer classification map of South Africa.
3) Department of Water Affairs (2013): Aquifer Vulnerability of South Africa.
4) The South African Bureau of Standards, SABS-089-3 (1999): Part 3: The installation of underground storage tanks, pumps/dispensers and pipework at service stations and consumer installations.
5) Vegter JR (2000) Groundwater Development in South Africa and an Introduction to the Hydrogeology of Groundwater Regions. WRC Report No. TT 134/00. Water Research Commission, Pretoria, South Africa.
6) Water research Commission, Manual on Quantitative Estimation of Groundwater Recharge and Aquifer Storativity, (DB Bredenkamp et al), June 1995.
7) Barton, J.M., Du Toit, M.C., Van Reenen, D.D., and Ryan, B. 1983. Geochronologic studies in the southern marginal zone of the Limpopo Mobile Belt, Southern Africa.
8) Du Toit, W.H. 1984. Grondwater ondersoek: Letsitele. Report No GH3377, Directorate Geohydrology, Department of Water Affairs and Forestry

APPENDIX

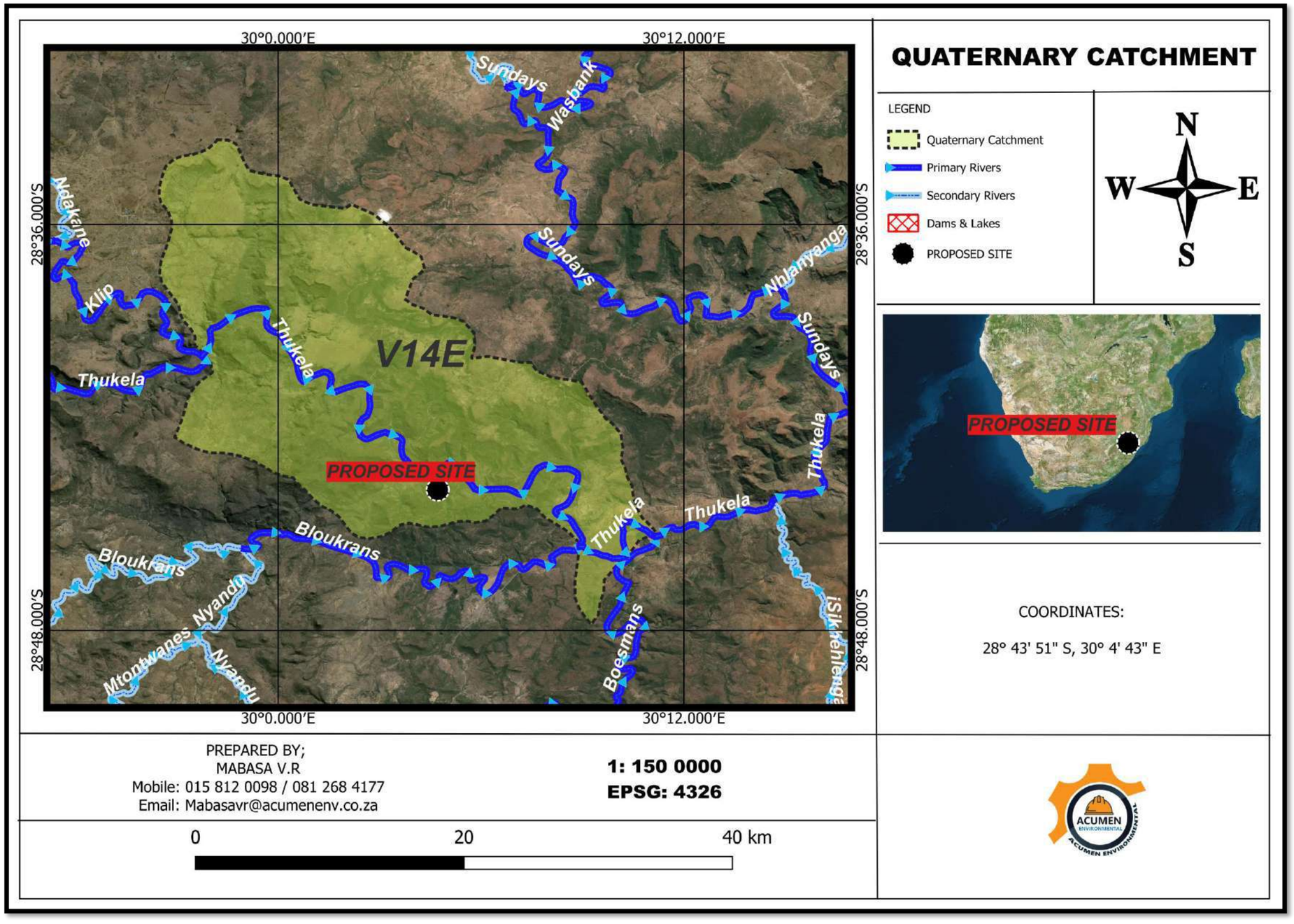
APPENDIX A: TOPOGRAPHIC MAP



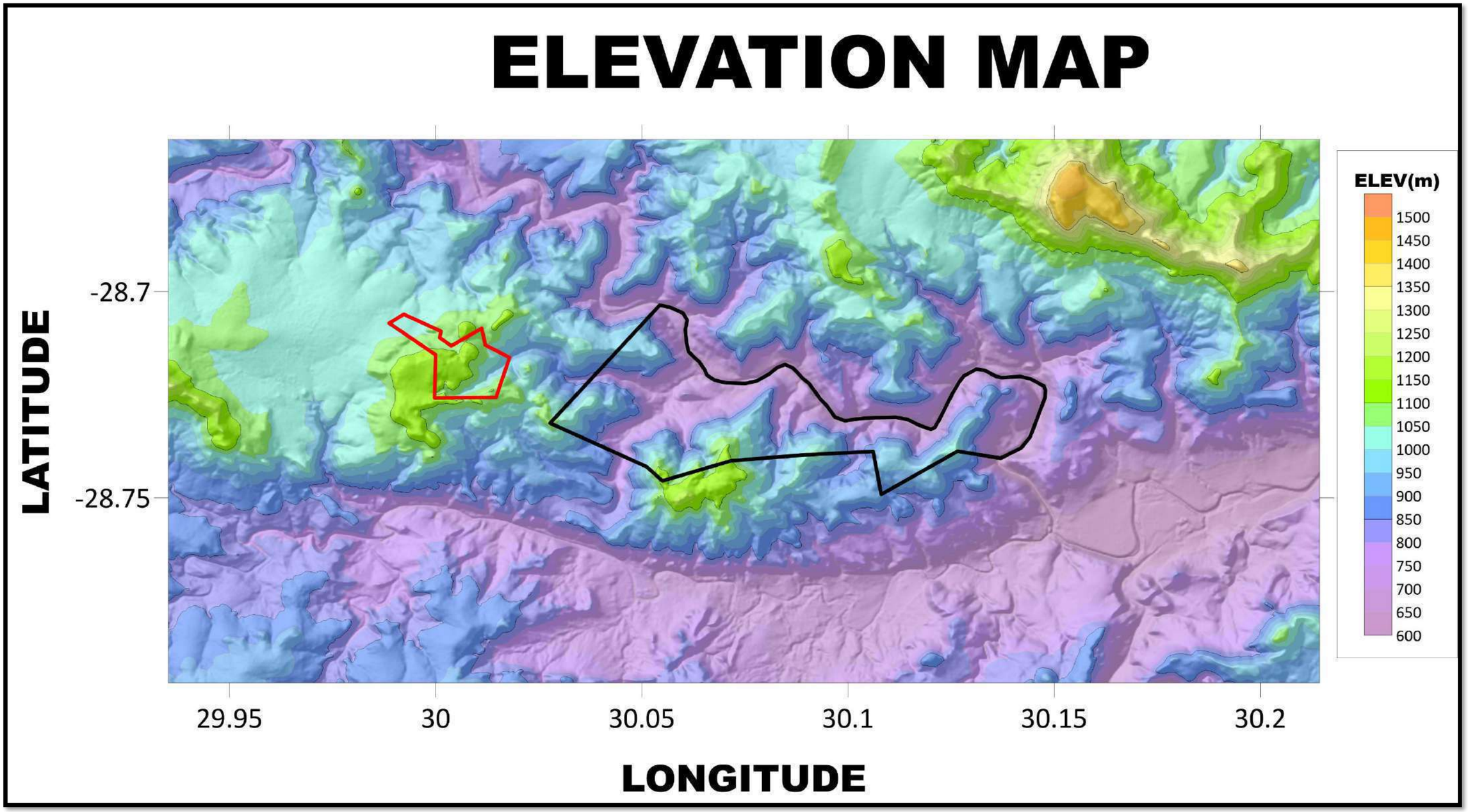
APPENDIX B: SATELLITE MAP

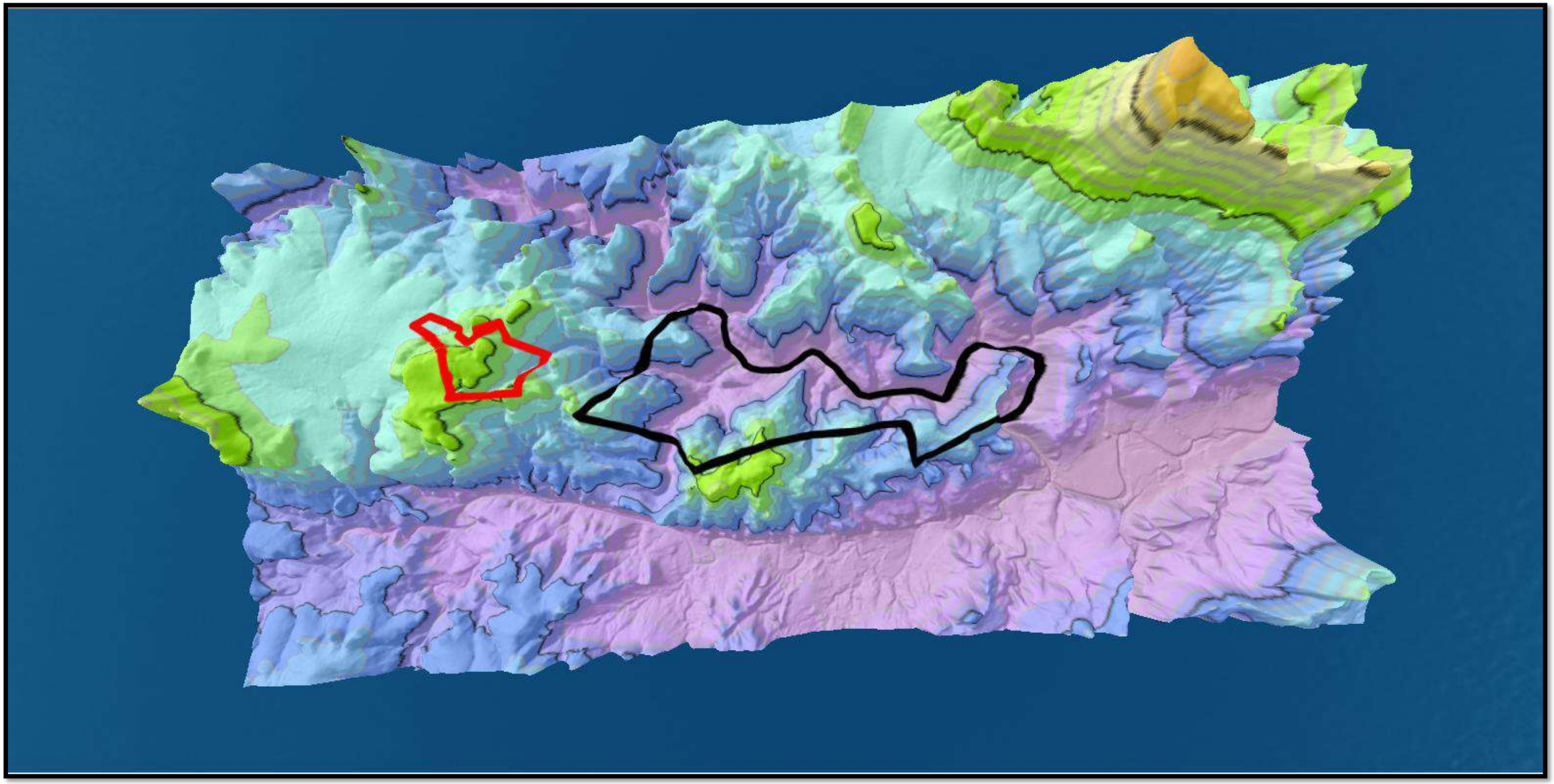


APPENDIX C: QUATENARY CATCHMENT

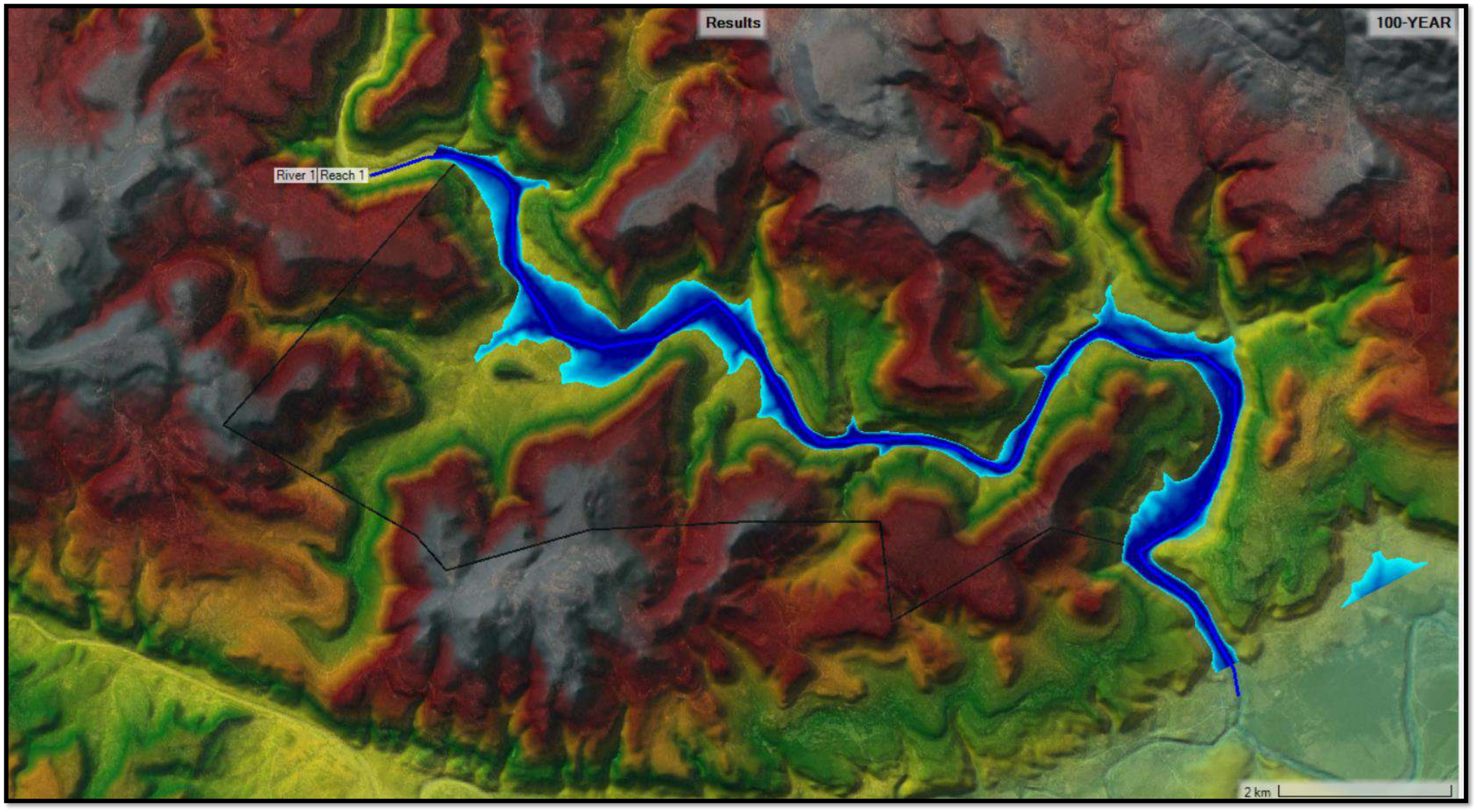


APPENDIX D: 3D MAP

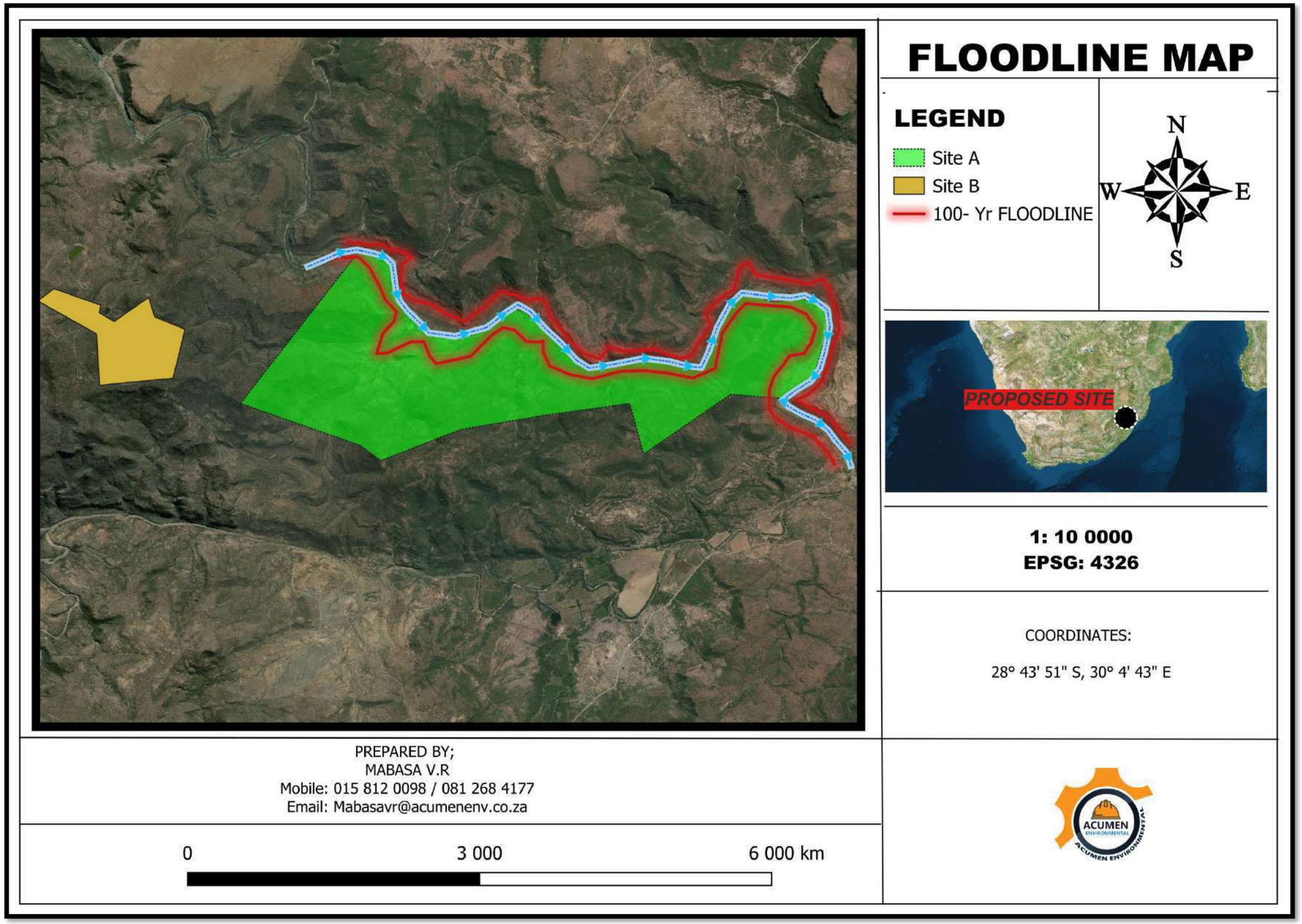




APPENDIX: FLOODLINE MAP



APPENDIX E POST PROCESSING FLOODLINE MAP



APPENDIX F HYDROLOGY SENSITIVITY MAP