Basic Assessment Report and Environmental Management Plan for Africa Gulf International Mining (Pty) Ltd for the prospecting of Chrome ore, Gold ore, Monazite (Heavy Mineral), Platinum Group Metals (PGM), Rare Earths and Uranium Ore

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

Prepared for

Africa Gulf International Mining (Pty) Ltd

File Reference Number: NW30/5/1/1/2/14237 PR

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

And

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

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Document Detail

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Report Title:	Basic Assessment Report and Environmental Management Plan for Africa Gulf International Mining (Pty) Ltd for the prospecting of Chrome ore, Gold ore, Monazite (Heavy Mineral), Platinum Group Metals (PGM), Rare Earths and Uranium Ore		
Client Name:	Africa Gulf International Mining (Pty) Ltd		
EAP:	Niara Environmental Consultants (Pty) Ltd		

Document History

Revision	EAP/Author	Reviewed By	Date of Issue	Comments
1	Orlinda Mafika	Vumile Ribeiro	22 August 2024	

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Independence

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Declaration of Independence

I Vumile Ribeiro, as duly authorised representative of Niara Environmental Consultants (Pty) Ltd., hereby confirm my independence and declare that I:

- I act as the independent Environmental Assessment Practitioner in this application;
- I will perform 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 Environmental Impact Assessments, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply 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 form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 48 and is punishable in terms of Section 24F of the Act.

Signature of the EAP:	V. Ribeiro
Designation:	Senior Environmental Consultant
Qualifications:	BSocSc Honours Environmental Analysis and Management
Name of Company:	Niara Environmental Consultants (Pty) Ltd
Experience (Years):	Seventeen (17) +
EAPASA Registration Number:	2019/1183

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 a Basic Assessment Report and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

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

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

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

Objective of the Basic Assessment Process

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

- determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- determine the—-
    - nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
    - degree to which these impacts—
        - can be reversed;
        - may cause irreplaceable loss of resources, and
        - can be avoided, managed or mitigated;
- identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- identify suitable measures to manage, avoid or mitigate identified impacts; and
- identify residual risks that need to be managed and monitored.

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List of Abbreviations and Acronyms

Acronym / Abbreviation	Definition
˚C	Degrees Celsius
BID	Background Information Document
CARA	Conservation of Agricultural Resources Act, 1993
COGTA	Cooperative Governance and Traditional Affairs
CRR	Comment and Response Report
CV	Curriculum Vitae
DAFF	Department of Agriculture, Forestry and Fisheries
DMRE	Department of Mineral Resources and Energy
DWS/DWAF	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMP	Environmental Management Programme
GIS	Geographic Information Systems
GN	Government Notice
GNR	Government Notice Regulation
GPS	Global Positioning System
ha	Hectares
I&APs	Interested and/or affected parties
kg	Kilogram
km	Kilometer
LoM	Life-of-Mine
m	Meter
MAP	Mean Annual Precipitation
mm	Millimetres
MPRDA	Mineral and Petroleum Resources Development Act, 2002
Mt	Million tonnes
MWP	Mining Works Programme
NEM: AQA	National Environmental Management: Air Quality Act, 2004
NEMA	National Environmental Management Act, 1998
NEM: BA	National Environmental Management: Biodiversity Act, 2004
NEM: WA	National Environmental Management: Waste Management Act, 2008
NRA	National Heritage Resource Act, 1999
NWA	National Water Act, 1998
NGO	Non-government organisation
PPP	Public Participation Plan/Process

ROM	Run-of-mine
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards
SAWS	South African Weather Services
SMS	Short Message Service
SPR	Source-Pathway-Receptor
SR	Scoping Report
SPLUMA	Spatial Planning and Land Use Management Act, 2013
t	Tonnes
t/hour	Tonnes per hour
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WMA	Water Management Agency / Area
WML	Waste Management Licence
WULA	Water Use License Application

Section A: Basic Assessment Report

1 Details of the Applicant and EAP

1.1 Project Applicant

The Applicant, Africa Gulf international Mining (Pty) Ltd is a private mining company that operates within the mineral-rich regions of South Africa. The company focuses on the exploration, development, and production of a variety of mineral resources, including precious metals, base metals, and other industrial minerals.

Table 1-1: Applicants Details

Name of Applicant:	Africa Gulf international Mining (Pty) Ltd
Registration No:	2022 / 737194 / 07
Responsible Person:	SW van der Merwe
Physical Address:	264 Sidney Street, Waterkloof Pretoria 0181
Postal Address:	264 Sidney Street Waterkloof, Pretoria Gauteng 0181
Telephone No:	+27 82 859 6349
Email:	sw@swmlaw.co.za

1.2 Details of the EAP

Founded by Vumile Ribeiro, Niara Environmental Consultants (Pty) Ltd is a 100% black female owned organisation. Our focus is environmental management services, integrated water resources management, biophysical studies as well as social issues and processes. Our key management personnel have accumulated vast experience in environmental management, integrated water resources management, mine closure and rehabilitation, and related fields. We assist our clients and communities they operate within in recognising that a healthy natural resource base is essential for economic self-sufficiency and that it provides opportunities for future livelihood options. Integral to this approach, is the need to educate our clients about the impact of their activities on their environment.

The details of the EAP are captured in the table below.

Table 1-2: EAPs Details

Name of Practitioner:	Mrs Vumile Ribero
Registration No:	2019/1183
Responsible Person:	Mr Ferdie Nieman
Physical Address:	Office 1 Palm Place Office Park, 22 Bram Fischer Drive, Linden, Johannesburg, 2195
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1.3 Expertise of the EAP

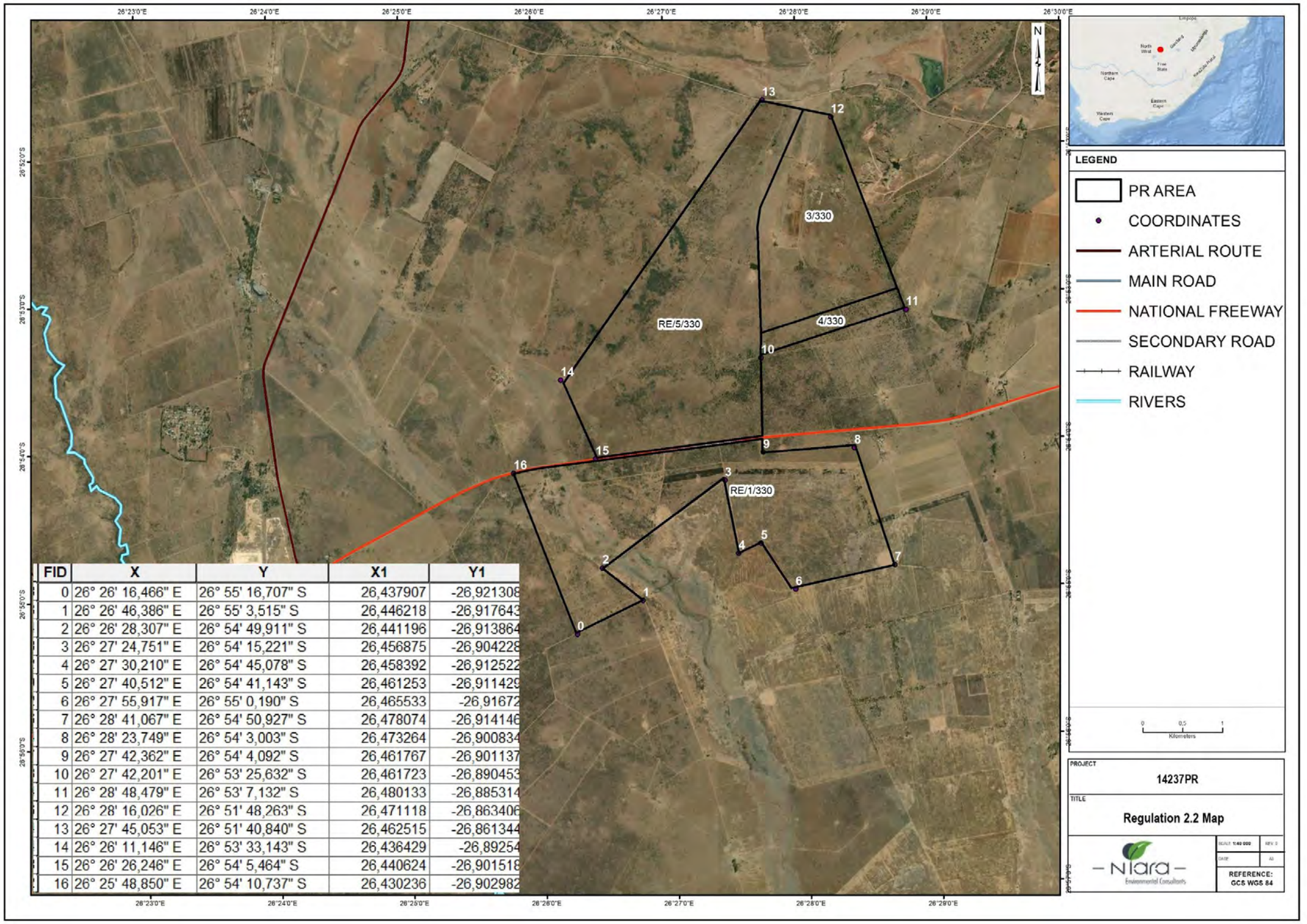
Proof of the EAP and Specialist experience and qualifications can be found in Appendix A.

2 Location of Overall Activity

Table 2-1: Activity Location

Farm Name:	Elandslaagte Ptn 1,3 4 & 5
Application Area (Ha)	~ 1054 Ha
Magisterial District:	Klerksdorp Magesterial District, North West Province
Distance and Direction from Nearest Town:	30km West of Klerksdorp
21 Digit Surveyor General Code for each Farm Portion	T0IP00000000033000001 T0IP00000000033000003 T0IP00000000033000004 T0IP00000000033000005

2.1 Locality Map



FID	X	Y	X1	Y1
0	26° 26' 16,466" E	26° 55' 16,707" S	26,437907	-26,921308
1	26° 26' 46,386" E	26° 55' 3,515" S	26,446218	-26,917643
2	26° 26' 28,307" E	26° 54' 49,911" S	26,441196	-26,913864
3	26° 27' 24,751" E	26° 54' 15,221" S	26,456875	-26,904228
4	26° 27' 30,210" E	26° 54' 45,078" S	26,458392	-26,912522
5	26° 27' 40,512" E	26° 54' 41,143" S	26,461253	-26,911429
6	26° 27' 55,917" E	26° 55' 0,190" S	26,465533	-26,91672
7	26° 28' 41,067" E	26° 54' 50,927" S	26,478074	-26,914146
8	26° 28' 23,749" E	26° 54' 3,003" S	26,473264	-26,900834
9	26° 27' 42,362" E	26° 54' 4,092" S	26,461767	-26,901137
10	26° 27' 42,201" E	26° 53' 25,632" S	26,461723	-26,890453
11	26° 28' 48,479" E	26° 53' 7,132" S	26,480133	-26,885314
12	26° 28' 16,026" E	26° 51' 48,263" S	26,471118	-26,863406
13	26° 27' 45,053" E	26° 51' 40,840" S	26,462515	-26,861344
14	26° 26' 11,146" E	26° 53' 33,143" S	26,436429	-26,89254
15	26° 26' 26,246" E	26° 54' 5,464" S	26,440624	-26,901518
16	26° 25' 48,850" E	26° 54' 10,737" S	26,430236	-26,902982

Figure 2-1: Regulation 2.2 Map of 14237PR

3 Description of the Scope of the Proposed Overall Activity

The applicant proposes to prospect for Chrome ore, Gold ore, Monazite (Heavy Mineral), Platinum Group Metals (PGM), Rare Earths and Uranium Ore on portions 1, 3, 4 and 5 of the farm Elandslaagte 330; Registration Division IP near the town of Klerksdorp in the North West Province. The overall application area covers approximately 1054 hectares.

The proposed activities that are planned to achieve optimal prospecting include the following:

- Non-Invasive Prospecting
  - Geophysical Survey,
  - Field surveys,
  - Literature Studies,
  - Obtaining historical borehole and trenching data and
  - Resource information
- Invasive Prospecting
  - Infill Drilling and
  - Lab Analysis of cores/samples.
- Non-Invasive Prospecting
  - Analytical Desktop and
  - Feasibility Studies

3.1.1 Listed and Specified Activities

Table 3-1: Listed Activities

Name of Activity	Aerial Extent of the Activity	Listed Activity	Applicable Listing Notice
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), as well as any other applicable activity as contained in this Listing Notice or in Listing	324 Ha	X	GN R 327, Activity 20

Name of Activity	Aerial Extent of the Activity	Listed Activity	Applicable Listing Notice
Notice 3 of 2014, required to exercise the prospecting right.			
Infrastructure including drilling sites, office areas, access routes etc.	<5Ha		
The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	<20Ha	X	GN R 327, Activity 27

3.1.2 Description of the Activities to be Undertaken

Description Of Planned Non-Invasive Activities:

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

1. Desktop Study

   A full desktop study on historical exploration and information of the application and adjacent properties will be compiled.

2. Geochemical Surveys

   No geochemical surveys will be conducted in the prospecting area.

3. Geophysical Surveys

   3.1 Geophysical Exploration Techniques

   Geophysical prospecting and exploration is the geophysics applied to the location of mineral deposits or geological structures concealed beneath the surface of the earth. In general, a hidden ore body or geological structure associated with it must possess one (or more) physical property that is different from surroundings in order to cause a measurable effect or anomaly in a geophysical survey. The main physical properties exploited during geophysical prospecting are:

   - Electrical Properties;
   - Magnetic Properties;
   - Nuclear Properties; and

- Gravity Properties.

The main instrument types used for geophysical exploration are:

- Magnetic methods;
- Electro-magnetic methods;
- Electrical methods;
- Other geophysical techniques;

a) *Magnetic Methods*

Certain types of ore, especially magnetite, ilmenite and pyrrhotite bearing sulphide deposits, produce distortions in the earth's magnetic field. Some iron-rich manganese and chromium ore may also yield magnetic anomalies. The ferro-magnetic minerals have two distinct magnetic properties. One is that the earth's magnetic field effectively turns the orebody into a large magnet, which in turn warps the normal field, thus producing anomaly. The other is that the ferro-magnetic materials often have a residual magnetism due to their original formation and this residual magnetism may act at an angle to the earth's magnetic field, thus strengthening or weakening the original field and thus forming anomalies. A magnetic survey may be established from the air or at ground level.

b) *Electro-Magnetic Methods*

When a transmitted electro-magnetic field is propagated through the ground it induces an electrical current in any conductor in its path. These secondary currents in turn produce their own alternating secondary electro-magnetic field, which opposes the primary field. The lower the resistance of the conductor, then the stronger the opposing current will be. Thus, if the induced field is passed through a good conductor such as an ore body containing graphite, phyrotite, pyrite, chalcopyrite or magnetite, a strong secondary field is set up.

c) *Electrical Methods*

Three forms of electrical geophysical prospecting methods are used: self-potential, resistivity and induced polarization. The self-potential method is useful as an indicator of near surface anomalies because it is cheap and simple to operate. If two non-polarizable electrodes are driven anywhere into the ground and connected to the terminals of a sensitive voltmeter, a small voltage is found to exist between terminals.

In the resistivity method, an electric current is sent into the ground and a pair of electrodes and a sensitive voltmeter measures the resulting distribution of potentials. When an electrical current is passed into the earth, its theoretical paths through homogenous ground are known.

d) *Other Geophysical Techniques*

Several other techniques are available for geophysical prospecting such as seismic and gravity techniques. Such methods are suitable for structural mapping although they have some application to specific types of ore body.

Gravity techniques are based on small changes in the earth's surface gravitational effect caused by a pool of rocks lying up to several thousand meters below surface. It is used to locate faults, anticlines and other structures and may also .be used to detect high density orebodies.

Seismic methods are based upon physical characteristics by which large differences occur in the velocity of sound waves in geological strata.

Description Of Planned Invasive Activities:

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

1. Diamond Drilling

Diamond drilling is the most common method of exploratory drilling and is frequently used for holes greater than 20 meters in depth. Large sample is required for geological and a geotechnical purpose, the diameter of the core is kept small to minimize drilling costs. The core is removed in the core barrel and carefully laid in the special box. The beginning and the end of the core is carefully marked with the depth of the hole. The core is then cleaned and logged. If the core is mineralized it is normally split and one half is retained for geological purposes and then sent for assay.

2. Hole Depth and Spacing

To minimize the drilling requirements, an orebody is frequently drilled in stages:

a) *Phase 1*

Location of the holes will depend on the results of the desktop study. All holes will be logged by the Geologist and samples sent for analysis.

b) *Phase 2*

If the results of the phase 1 drilling indicate potential economically mineable resources a further 15 holes will be drilled and the cores analysed.

Description of Pre-/Feasibility Studies

(Activities in this section includes but are not limited to: initial, geological modelling, resource determination, possible future funding models, etc).

1. Geology and resources assessment

This is the step where drilling and sampling works are performed. Various methods are available for drilling based on the soil and mineral properties. The drilled samples are prepared for the assay to determine the minimum, maximum and average ore grade and

these figures are used to make the reserve estimation. The drilling and sampling procedure based on the certain guidelines developed by Africa Gulf International Mining (AGIM)

2. Mine design and mineral reserve determination

This step involves developing the most economical way of mining. Mine planning, model development, operation models and cost analysis are performed and thus the mineable reserve is estimated based on the economy. The major steps for mine development are mine access (surface / underground (UG)), conveying system (especially in UG mines), backfill requirement, ore haulage, ventilation, material top size, etc. Then the mining equipment selection is preformed and justified against the performance and economy. The next major stage in mine development is the disposal of overburden generated. Results of the prospecting drilling are used to determine the optimal methods by which the mineral can be exploited (if any) and inform the mine design. This information in turn informs developers decisions on whether to pursue a mining project or not.

3. Metallurgy and process facility design

This is the major backbone of the project development structure. Sampling must be carefully carried out to ensure that the samples used in the metallurgical test work are representative of the whole ore body, some major characteristics of the ore body is determined prior to development of the plant design which includes grinding work, indices, feed size, settling characteristics, filtration characteristics etc. Metallurgical test work are performed to determine the amenability of the given ore to different concentration technologies. The major processes that are looked at:

- Crushing and grinding;
- Concentration (sizing, gravity or flotation);
- Dewatering (mechanical or filtering); and
- Chemical extraction (especially for gold and rare earth minerals).

When these tests are completed, based on the test results the basic material flowsheet is developed. Once this is complete, equipment selection and plant layout figures are generated. This data is used to estimate the amount and grade of concentrate, middle and tailings that are used to search potential customers and revenue earned. This information in turn informs the economic viability of mining projects.

4. Tailings disposal planning

In the case when tailings can't be sold, the tailing disposal system plays a crucial role in obtaining the permissions necessary to mine. If the tailings have hazardous or toxic materials like cyanide, mercury, etc. in it then the disposal system must be effective in order to reduce the harmful effect on the environment and society. No tailings are generated during the prospecting activities apart from generation of limited quantities of drilling muds, however the evaluation of mining projects must consider the potential nature of tailings and disposal options, as these could significantly impact on the viability of project development.

5. Infrastructure design

This section includes the civil and major earthworks required to start the production. The office, labs, storage units, plant buildings, mining equipment shelters, etc. are included in the infrastructure.

6. Power supply planning

Determining the power source, power line distribution, total power required and the power cost to potential future mining operations are the major things to be looked into in this step. During prospecting, mobile power sources are typically used for emergency lighting and security lighting at night, with equipment being largely diesel driven.

7. Water

Most of the plant processes in mining projects are water based, so estimation of water requirement plays an important role in the feasibility studies, when planning mining projects. Then based on the water demand water, the costs are evaluated. During prospecting, water is required to address drinking water requirements for on-site personnel.

4 Policy and Legislative Context

Table 4-1: Applicable Legislation and Guidelines

Applicable Legislation and Guidelines used to Compile the Report	Reference was applied	How does this Development comply with and respond to the Policy and Legislative Context
The South African Constitution (Act 108 of 1996) constitutes the supreme law of the country and guarantee the right of all people in South Africa. Furthermore, the Bill of Rights (Chapter 2- Section 24 (a) (b) under the South African Constitution (Act 108 of 1996) emphasize that "Everyone has the right (b) to have the environment protected,	Applied at potential impacts identification as well as mitigation measures and public participation	Rights of all I & AP's who are directly or indirectly involved in the project has been respected and their concerns attended to during public consultation
The NEMA (Act No.107 of 1998) (as amended) is regarded as one of the important pieces of general environmental legislation as it provides a framework for environmental law reform. The main objective of this act is to ensure that ecosystem services and biodiversity are protected and maintained for sustainable development.	This Basic Assessment and the EMP	An Environmental Authorisation application was submitted to the North West DMRE. The BAR and EMP is yet to be submitted to DMRE for approval and acceptance. Mitigation measures and recommendations will be provided according to best practice standards.
National Water Act, 1998	Prospecting within 500m of a wetland	A preliminary assessment of the site has shown that there are wetlands on the farm

Applicable Legislation and Guidelines used to Compile the Report	Reference was applied	How does this Development comply with and respond to the Policy and Legislative Context
		portions affected by the application. Clarification is required from DWS whether a Section 21 (c) and (i) Water Use License will be required. Apart from this, any other proposed water uses will be identified during consultations with DWS.
Mineral and Petroleum Resources Development Act, 2002	Application for Prospecting in terms of Section 16	A Prosecting Right Application was submitted to DMRE by the applicant. The acceptance letter for this application was issued on 30/04/2024 with reference NW30/5/1/1/2/14237PR.

An overview of the key legislative requirements applicable to the proposed mining operations followed in the Basic Assessment process is provided in the Final Basic Assessment Report. In summary, the proposed prospecting activities require authorisation in terms of the National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA), as amended, and a Prospecting Right has to be obtained in terms of the MPRDA. As noted above, a Basic Assessment process must be undertaken in order for DMRE to consider an application for Environmental Authorisation for prospecting.

5 Need and Desirability of the Proposed Activities

Mining of uranium and gold, along with additional minerals such as monazite, PGMs (Platinum Group Metals), chrome, and rare earth elements, is crucial on a global scale. These minerals are essential for various industrial, technological, and energy applications. The demand for these minerals is driven by their unique properties and the increasing need for sustainable energy solutions, advanced electronics, and industrial processes. Prospecting for these minerals is needed to identify viable mineral reserves for potential exploitation.

Uranium:

Uranium is a key component in nuclear energy production, which is a low-carbon alternative to fossil fuels. The global shift towards reducing greenhouse gas emissions has led to increased demand for nuclear energy. South Africa, with its substantial uranium reserves, is well-positioned to contribute to this demand.

Gold:

Gold remains a valuable commodity for investment, jewellery, and various industrial applications. It is also crucial in the financial sector as a hedge against inflation and economic uncertainties. The mining of gold provides significant revenue and employment opportunities in South Africa.

Monazite and Rare Earths:

Monazite is a source of rare earth elements, which are critical in manufacturing high-tech devices, renewable energy technologies, and defence applications. The global market for rare earth elements is expanding due to their indispensable role in modern technology.

PGMs (Platinum Group Metals):

PGMs, including platinum, palladium, and rhodium, are vital for catalytic converters in the automotive industry, reducing harmful emissions. They are also used in electronics, jewellery, and as investment assets. South Africa is the world's largest producer of PGMs, and their continued mining is essential for maintaining supply chains.

Chrome:

Chrome is used in stainless steel production, which is fundamental for various industries, including construction, automotive, and manufacturing. South Africa holds a significant share of the world's chrome reserves, making it a key player in the global market.

5.1 Economic Impact of Mining in South Africa

5.1.1 Employment and Revenue:

The mining industry remains one of South Africa's largest employers, providing jobs to approximately 460,000 individuals in 2023. This sector also supports numerous parallel industries, contributing significantly to local and national economies.

The total revenue generated by the mining sector was substantial, with platinum group metals (PGMs) seeing record industrial demand. South Africa’s abundant PGM reserves position the country to potentially benefit significantly from this sustained demand. Prospecting is not associated with significant employment opportunities (like mining is) but is an essential step in the identification of minerals that could be mined, and thus the employment opportunities and revenue generated from mining, would not be possible without prospecting activities being undertaken to inform mining projects.

5.1.2 Investment and Exports

PGM and gold exports play a vital role in bolstering South Africa's foreign exchange reserves, serving as significant sources of export revenue that help stabilize and strengthen the nation's currency. Investment in PGM and gold mining fuels economic growth by increasing national income and fostering regional development. This investment frequently results in the enhancement of infrastructure, such as roads, power supplies, and facilities, which not only supports the mining sector but also benefits other areas of the economy. Investment and exports from the Mining of various minerals is made possible by prospecting activities that inform development of mining projects.

5.1.3 Challenges and Opportunities

The mining industry in South Africa confronts substantial challenges, including high levels of criminal activity, illegal mining, escalating labour costs, community activism, and bureaucratic inefficiencies. Infrastructure limitations, particularly in water, electricity, roads, and ports, further hinder operational efficiency. Despite these obstacles, the growing demand for minerals like PGMs—vital for hydrogen technology and renewable energy—presents significant opportunities. The adoption of new technologies and increased automation could enhance cost-efficiency, safety, and sustainability, though this must be weighed against potential job losses.

Prospecting Projects are often challenged by perception and expectation that Mining development will necessarily ensue. This cannot be guaranteed at this stage and will only be informed by the results of prospecting. Prospecting results will inform the Holder of the Prospecting Right whether a mining project could be developed, and what the nature of such a mining project could be (small or large-scale operation, short or long-term, open pit or underground, mineral processing requirements etc.). Prospecting applications are therefore associated with significant uncertainty as the Applicant and EAP are not able to clearly define future plans for a site, beyond the intent of the Applicant to undertake prospecting activities. This uncertainty often leads to fear and frustration for landowners, and unrealistic expectations of job-seekers (and the unavoidable disappointment if prospecting results indicate that jobs may not be realized).

5.1.4 Environmental and Social Considerations

- Mining and prospecting operations must comply with stringent environmental regulations to minimize ecological impact. Sustainable practices and rehabilitation plans are essential to mitigate adverse effects.
- Social development initiatives, including the implementation of Social and Labor Plans (SLPs) and Broad-Based Black Economic Empowerment (B-BBEE) programs, ensure that mining activities benefit local communities through job creation, training, and infrastructure development. Prospecting projects are not associated with SLPs, but benefits arising from SLPs associated with mining projects will not be realised if prospecting was not undertaken to inform the development of mining projects.

5.1.5 Future Outlook

The future of South Africa's mining sector depends on effectively navigating a landscape marked by both challenges and opportunities. Key to overcoming current obstacles will be collaboration among stakeholders, the adoption of technological advancements, and a commitment to sustainable practices. The mining sector remains a cornerstone of South Africa’s economy, with the potential to drive significant positive change and contribute to national growth in the years ahead. The extraction of uranium, gold, monazite, PGMs, chrome, and rare earth elements is essential for economic growth, job creation, and maintaining global competitiveness. These minerals are integral to various industries, and their responsible extraction will yield long-term benefits for both the country and its people. The proposed Project aims to investigate the Application Area for the feasibility of mining project development.

6 Motivation for the Overall Preferred Site, Activities and Technology Alternatives

The activities associated with prospecting and exploration are commonly defined in the market and are quite straight forward without too much technical issues. This is an age-old practice and is used to summarize an area of interests' mineral potential. The preferred site has been identified due to the nature of the area and the mineral reserves believed to be found in this area. This is done by making use of the geological maps as well as some verified information.

The other determining factor is the availability of areas that is not yet covered by an existing mining right, prospecting right or mining permit. There are well defined access roads and sufficient space to establish a site office and work from there.

The technology used for prospecting has been developed over years and is currently effectively being used. The drilling rigs have been purpose build and the drills themselves have also been made purposefully for core abstraction. The software that is used for modelling of the resources are very well developed and effectively models resources as such that a resource and reserve statement can be depicted from it.

Specific drill sites will be informed by the desktop investigations and on-site circumstances, including discussions with the surface rights holders.

6.1 Full Description of the Process followed to reach the Proposed Preferred Alternatives within the Site

Consideration was given primarily to the landscape and sensitive areas as well as the no-go areas. That will determine the space available for drilling and site establishment while great care is taken to minimize the disturbance footprint.

6.2 Details of the development footprint alternatives considered

With reference to the proposed site layout plan, the proposed layout is clearly defined and may be refined based on results of the non-invasive prospecting activities and discussion with landowners and occupants of the application site. The alternatives considered are detailed as per the table below:

Aspect	Alternative	Reasoned Discussion
Properties included	No property alternative was considered due to the nature of the activity. The Diamond mining market is quite competitive and due to the process in which one applies for a right, the area is pre-determined to the application. This means that no alternative in terms of properties can be assessed	
Type of Activity	Prospecting – Core Drilling	Prospecting is conducted by means of core drilling. This is best suited for this environment and for the minerals to be prospected for due to the depth at which the resources might be found. The alternative would be trenching, or even bulk sampling. However, a small 5 ha bulk sample will not be indicative of the whole property and thus not be beneficial to this process of determining feasibility. Trenching also

Aspect	Alternative	Reasoned Discussion
		provides only limited geological data at relatively shallow depths. Diamond drilling is the most common form of prospecting drilling. The technology is well understood and proven and presents minimal risk.
Layout Design	Site Layout	Various factors are taken into consideration when the layout was developed. Firstly, there is the no-go area, such as watercourses, wetlands, etc. Then you have infrastructure restrictions like houses, buildings, fences, roads, powerlines etc. Lastly, there is the physical characteristics of the property like the contours and slopes etc. The vegetation is also an important factor as the restriction would be to have a minimal and if possible, no impact on the natural vegetation.
Technology	Diamond Core Drilling	For the purpose of this project no alternatives were considered in terms of technology due to the nature of the prospecting to be conducted. Diamond Core Drilling was selected considering that there is a need to develop a resource and reserve model and there needs to be cores collected in order to analyse the quality for the same model.
No-Go	The no-go option considered included that no invasive drilling be conducted and only desktop analysis be done. This will not render the project to be successful as there would be no actual, proved data available and there would be no qualities available. This would render any form of feasibility to be unsuccessful as the quality and quantity of the resource is of utmost importance to determine.	

7 Details of the Public Participation Process followed

Public participation is the cornerstone of any EIA process. The principles of the NEMA govern many aspects of EIA's, including public participation. The general objectives of integrated environmental management laid down in the NEMA include to "ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment". The National Environmental Management Principles include the principle that "The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary to achieve equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured", which basically means that the person responsible for the application (EAP) must ensure that provision of sufficient and transparent information on an ongoing basis to stakeholders are made to allow them to comment, and to ensure that the participation of previously disadvantaged people, women and the youth are facilitated.

In terms of the amended NEMA EIA Regulations, 2014, when applying for environmental authorisation, the Environmental Assessment Practitioner managing the application must conduct at least a public participation process where all potential or

registered interested and affected parties, including the competent authority, are given a period of at least 30 days to submit comments on the basic assessment report and EMPr.

This section of the BAR and EMPr will explain the public participation process to be taken to comply with the abovementioned requirements.

Public participation will be undertaken in accordance with Chapter 6 of the EIA Regulations, as amended, and will include the following:

- Develop a stakeholder database for the Prospecting Right Application area.
- Placement of one advertisement (one local newspaper in English) and four on-site notices (in English) at appropriate locations on site and nearby.
- Written notification (in English) to owners and occupiers on or adjacent to the proposed project site; municipality ward councillor, local and district municipality; and relevant state departments.
- General communication with stakeholders (public and authorities).
- Dissemination of the Draft BA Report and EMPr for stakeholder comment online and at public areas.
- Notification of availability of Draft and Final Reports and review period will be made via email and bulk SMS.
- Once the database has been drafted, all I&AP's will be notified of a public meeting via an online platform upon registration of stakeholders.
- Stakeholder notification of authority decision on EA Application.

The stakeholder engagement comment period will be in accordance with the timeframes indicated in the EIA Regulations (30 days).

The following are and will be conducted in undertaking of the public participation process for the proposed area.

7.1 Identification of Interested and Affected Parties

The NEMA Regulations require identification of and consultation with I&APs. The term I&AP generically refers to persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively. Niara approach recognizes that Interested and Affected Parties (I&APs) are diverse in character and in their project interest. The following criteria were used to identify I&APs:

- Zone of influence: physical location relative to the project site and potential impacts. Generally, the closer stakeholders live to a project site, the higher their interest and the potential impacts of the project;
- Stakeholder values: the value stakeholders attach to the area that might be affected by the project. This includes aspects such as livelihoods, land use, ownership, heritage, and sense of place; and

- Jurisdiction: the mandate/influence of institutions over the regulatory process and public opinion.

In addition to the above criteria, the following aspects refined the I&AP identification process: Settlements were identified using the 1:50 000 topographical map, aerial imagery, title deed searches and through consultation. All the affected properties belong to private farmers and some portions are state owned land. Other I&APs identified, include Organs of State, who have jurisdiction over, or might have an interest in the proposed protecting activities, adjacent and other landowners, non-governmental organisations, and other organisations and/ private persons, and the Ward Councillors. Adjacent and non-adjacent landowners were identified through the review of property databases and deed searches, natural person (s) contact databases, and expanded through queries and recommendations made by identified stakeholders and general internet-based searches.

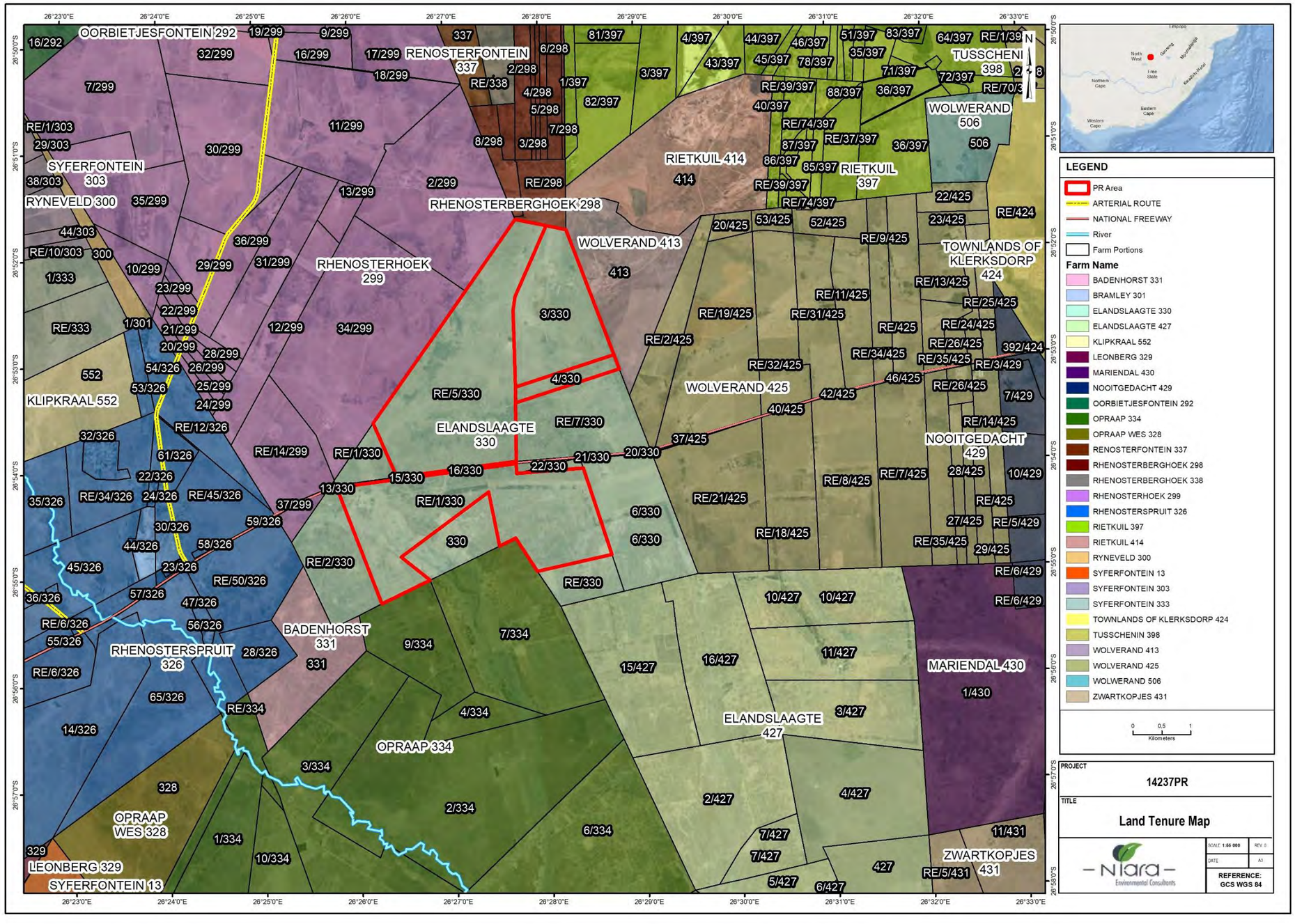


Figure 7-1: Land Tenure Map

7.2 Registration and BAR Phase

The public participation process has commenced by providing potential interested and affected parties (I&AP's) 30 days to register as interested and affected parties and to comment on the draft BAR and EMPR. The registration and commenting process will start on the 22 August 2024 and will end on the 22 September 2024. However, an extension will be provided to all I&AP's to ensure that all parties will be provides enough time (at least 30 days) to comment on the reports.

7.3 Notification of potential and affected parties

The following methods of notification will be used to notify the potential interested and affected parties of the opportunity to register during the public participation process of the proposed area:

- Notices inviting potential interested and affected parties to register and comment on the draft BAR and EMPr for the proposed prospecting site were fixed at four sites. The notices were compiled to comply with the requirements of Regulation 41(3) of the amended NEMA EIA Regulations, 2014.
- Written notices will be sent to all surface owners and lawful occupiers of the land subject to the Prospecting Right Application (the site), owners/lawful occupiers of land immediately adjacent to the proposed site area, the municipal councillors of the ward in which the site is situated, representatives of the municipalities which has jurisdiction over the proposed site. These notices will be used to invite the parties to comments on the draft BAR and EMPR.
- The draft BAR and EMPr is submitted to all the commenting authorities for their comments.
- Once the database has been drafted, all I&AP's will be notified of a public meeting via an online platform upon registration of stakeholders.

7.4 Registration Interested and Affected Parties

The public participation process has commenced by providing potential interested and affected parties (I&AP's) 30 days to register as interested and affected parties and to comment on the draft BAR and EMPR. The registration and commenting process will start on the 22 August 2024 and will end on the 22 September 2024. However, an extension will be provided to all I&AP's to ensure that all parties will be provides enough time (at least 30 days) to comment on the reports.

All registered I&AP's will be put into a data base for the project. Once the database has been drafted, all I&AP's will be notified of a public meeting via an online platform as well BID and DBAR for commenting.

7.5 Summary of Issues Raised by I&APs

N/A as consultation with I& Aps is currently on going. These will be inserted in table 7-1 below and included in the final BAR.

Table 7-1: I&AP Listed Issues

Interested and Affected Parties		Date Comments Received	Issues Raised	EAPs Response to Issues as mandated by the Applicant	Section and Paragraph Reference in this Report where the Issues and or Response were Incorporated
Affected Parties					
Landowner/s	X				
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties					
Municipal councillor					
Municipality					
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e)					
Communities					
Dept. Land Affairs					
Traditional Leaders					

Interested and Affected Parties		Date Comments Received	Issues Raised	EAPs Response to Issues as mandated by the Applicant	Section and Paragraph Reference in this Report where the Issues and or Response were Incorporated
Dept. Environmental Affairs					
Other Competent Authorities affected					
Other Affected Parties					
Interested Parties					

8 The Environmental Attributes associated with the Alternatives

8.1 Baseline Environment

8.1.1 Climate

The project site is characterized by warm summers and mild winters. January and December are the warmest months, with average high temperatures of 29.5°C. The coldest months are June and July, with average highs of 18.3°C and average lows around 5.6°C. The wettest month is December, with 73 mm of rainfall over 16.7 days. The driest months are July and August. Humidity is lowest in September at 29%, and the most sunshine occurs in October and November (Weather Atlas).

Table 8-1: Climate data for the area associated with the proposed activity

Month	Mean Monthly Temperature (°C)	Average Daily Temperature	Average Monthly Rainfall (mm)	A-pan Evaporation (mm)
			Distribution %	Monthly rain
Jan	29.5	29.5	18	77
Feb	28.8	28.8	14.8	71
Mar	27.8	27.8	13.3	65
Apr	24.3	24.3	8.8	42
May	21.8	21.8	3.7	13
Jun	18.3	18.3	2.2	6
Jul	18.3	18.3	1.8	5
Aug	22.1	22.1	1.9	6
Sep	26.9	26.9	3.8	15
Oct	28.5	28.5	8.6	40
Nov	29	29	13.2	56
Dec	29.5	29.5	16.7	73

8.1.2 Precipitation/ Rainfall

The project site experiences a semi-arid climate with an annual average rainfall of approximately 300-400 mm. The majority of precipitation occurs during the summer months, from November to March, while the winter months, from April to September, are relatively dry with minimal rainfall. This seasonal distribution results in a pronounced wet and dry period, affecting local water resources and agricultural practices (Weatherbase, 2024).

8.1.3 Evaporation

The project site experiences high evaporation rates, particularly during the warmer months. The region's evaporation rates often exceed the amount of precipitation received, contributing to its overall aridity. Average annual evaporation can be around 1 500-2 000 mm, depending on specific local conditions and seasonal variations. This high evaporation rate significantly impacts water resource management and agricultural productivity in the area

8.1.4 Topography and drainage

The project site is situated in a relatively flat to gently undulating landscape typical of the North West Province. The topography is characterized by low-lying areas with occasional ridges and shallow valleys. The region's drainage system includes ephemeral streams and small rivers that flow primarily during the wet season. Due to the semi-arid climate and high evaporation rates, surface water is often minimal and does not persist year-round. The local drainage patterns are influenced by the limited rainfall and the generally low gradient of the terrain, resulting in slow runoff and infrequent flooding.

8.1.5 Surface Hydrology

8.1.5.1 Catchment Description

The project area lies within the quaternary catchments C24H and C24J, which are part of the revised Vaal-Orange Water Management Area 4 (formerly Middle Vaal). Catchment C24H covers 84,015.62 hectares, while C24J spans 207,306.03 hectares. Both catchments are subsets of the broader tertiary catchment C24, which is marked by diverse landscapes, including variations in elevation, soil types, and land use practices. The hydrology of C24H and C24J is influenced by both natural conditions and human activities, with streams, rivers, and wetlands playing essential roles in the water cycle of the region.

Geologically, these catchments feature a range of lithostratigraphic units, including the Hospital Hill Subgroup, known for its fine- to medium-grained quartzite and shale, and the Rietgat Formation, which consists of andesite to dacitic volcanic rocks. These geological formations affect the hydrological characteristics of the area, impacting infiltration, surface runoff, and groundwater recharge.

and use in C24H and C24J includes agricultural activities, urban developments, and natural vegetation, each impacting the catchment's hydrological dynamics. Agricultural practices can influence soil erosion and sediment transport, while urban areas may increase surface runoff and reduce infiltration. Natural vegetation areas help in maintaining soil stability and promoting groundwater recharge.

8.1.5.2 Water Management Area

The project area is situated within the Vaal-Orange Water Management Area (Previously subdivided into the Lower, Middle, Upper Vaal and Orange), which is a critical region for water management in South Africa. The Vaal-Orange Catchment Management Area (CMA) encompasses a vast geographical area extending from Ermelo in Mpumalanga to Kuruman in the Northern Cape, and from the Botswana border and Crocodile (West) and Olifants Catchments in the northwest to Lesotho in the southeast. It includes parts of the Orange river basin and the Lesotho Highlands Water Project (LHWP).

The Vaal-Orange WMA is split into two sub-regional areas: the Vaal River system, which is the main tributary of the Orange River, and the Orange River system itself. The management strategy involves integrating these previously separate catchment areas into a single entity for better coordination and resource management. According to the Department of Water and Sanitation (2023), the integrated Vaal-Orange CMA will operate under a regionalized model due to the area's size and diverse characteristics, ensuring effective management of water resources and addressing specific regional needs.

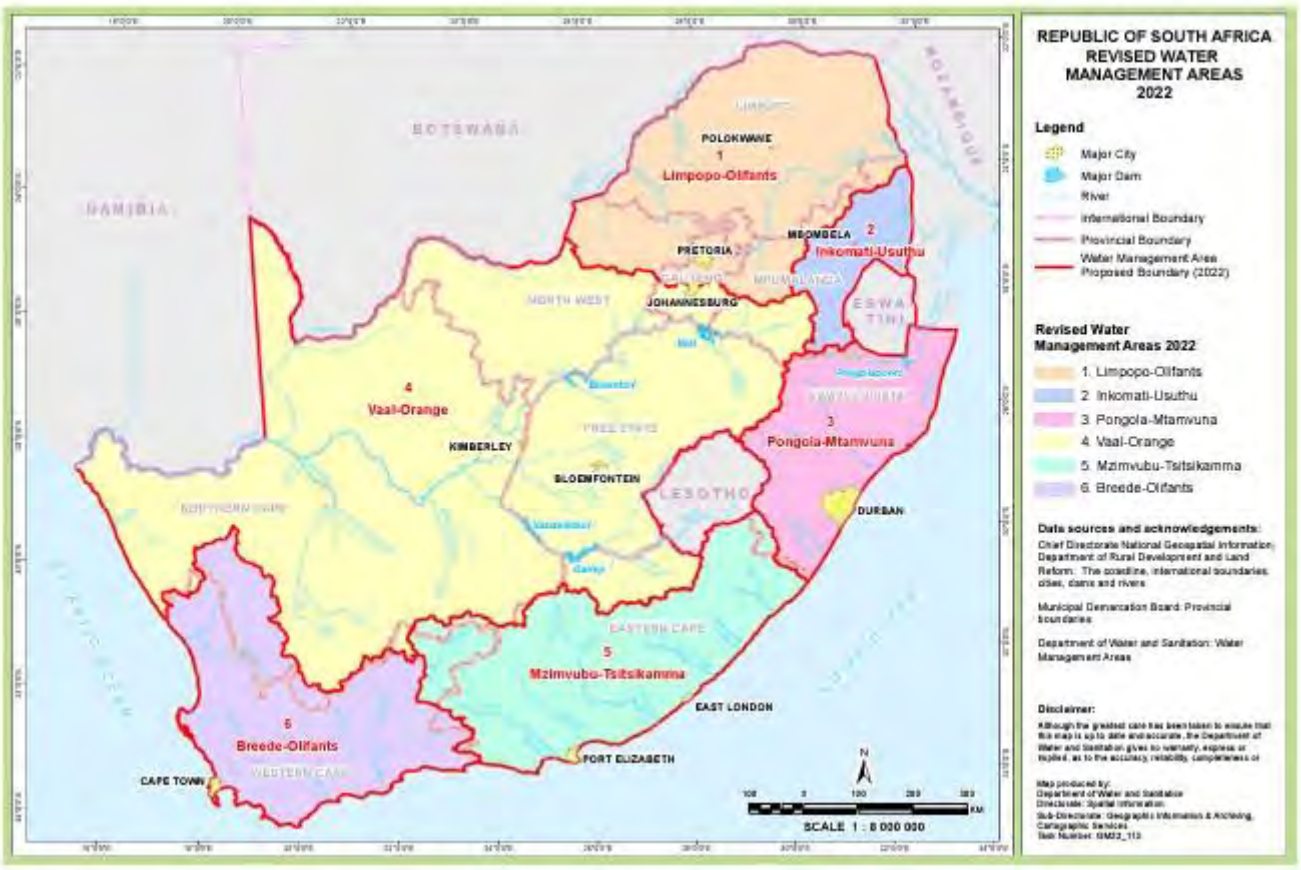


Figure 8-1: The Vaal-Orange WMA (DWS, 2023)

8.1.5.2.1 The Vaal Catchment Area

The Vaal River system, covering an area of 240,128 km², spans from central South Africa through the Free State to the confluence of the Mooi and Vaal Rivers. It crosses the southeastern part of Mpumalanga and the southwestern part of Gauteng, with its southern boundary adjacent to Lesotho. This system comprises the Vaal, Klip, Wilge, Liebenbergsvlei, and Mooi rivers, and includes major dams such as the Vaal, Grootdraai, and Sterkfontein. It supports economic activities, particularly industrial and mining operations in the greater Gauteng region.

Further downstream, the system extends from the confluence of the Vaal and Rietspruit rivers towards Bloemhof Dam, covering parts of the Free State and Northwest Province, including the Schoonspruit River in the north and the Vet River in the south. The Schoonspruit, Rhenoster, and Valsch rivers are also part of this system. From the Bloemhof Dam to the confluence of the Vaal and Douglas Rivers, the system includes areas of the Northwest Province, Northern Cape, and the southwest of the Free State, with its northern border adjoining Botswana. The Harts River is the only significant tributary to the Vaal River in this region.

8.1.5.2.2 The Orange Catchment Area

The Orange River, South Africa's longest river at 2,200 km, originates in the highlands of Lesotho and flows westward to the Atlantic Ocean at Alexander Bay. Draining a catchment area of approximately 1 million km², it serves as a crucial water resource for the country. Several water transfer systems stem from the Orange River, including the Lesotho Highlands Transfer Scheme, the Caledon/Modder transfer, the Orange/Fish transfer to the Eastern Cape, the Orange/Riet transfer, and the Orange/Vaal transfer scheme. These transfers highlight the importance of integrated management of the Vaal-Orange catchment for sustainable water supply.

The Orange River system spans mainly across the Free State and Northern Cape, with parts extending into the Eastern Cape. The catchment area features savannah grassland in the east and opens into wide plains from the foothills of the Maluti Mountains. The region's geology, primarily composed of sedimentary rocks of the Karoo Supergroup, has limited water-bearing capacity. The Upper Orange, including the Lesotho Highlands Water Project (LHWP), is a strategic component of the system and one of the world's largest water projects.

The lower part of the Orange River flows through Namaqualand and includes the Ai Ais-Richtersveld Transfrontier Park. This area covers much of the Northern Cape and parts of the Western Cape. Combined with the Vaal River system, the Orange River drains nearly two-thirds of South Africa's interior plateau. Major tributaries include the Modder, Riet, Kraai, and Caledon rivers. Additionally, the Orange River is an international resource shared by Lesotho, South Africa, Botswana, and Namibia, requiring cooperative management to ensure water availability and quality.

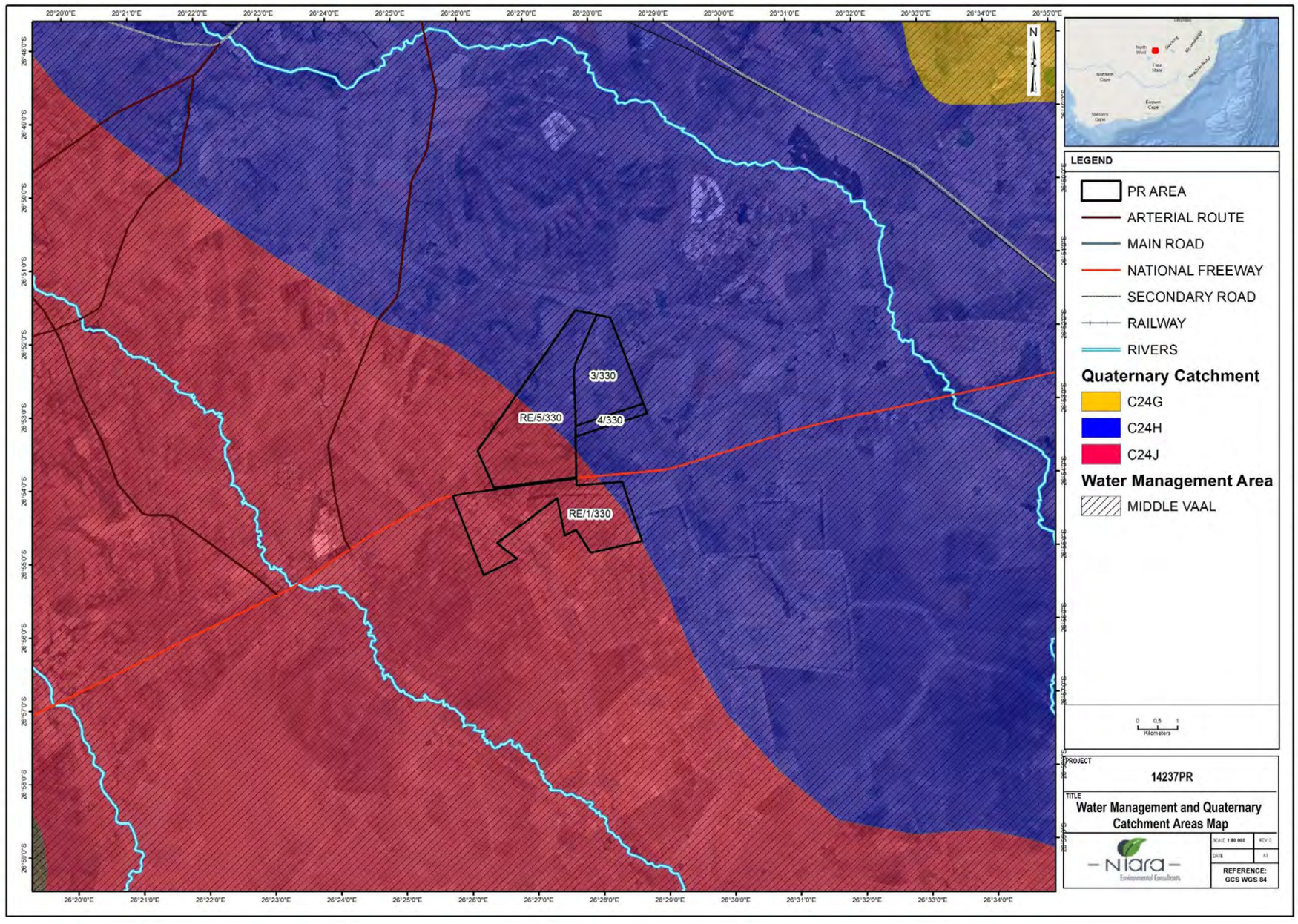


Figure 8-2: WMA and Quaternary Catchment Area Map

8.1.5.3 Mean Annual Runoff

The mean annual runoff in the region is 14.63 mm/year for quaternary catchment C24H and 5.77 mm/year for quaternary catchment C24J. This indicates that most precipitation in these areas is either infiltrating into the soil or evaporating, with relatively little contributing to surface runoff.

8.1.6 Landcover and Vegetation

The project site land cover is predominantly characterized by semi-arid vegetation, primarily consisting of natural grasslands. The area is classified into several land cover categories, including:

- Land Cover 9-Class: Includes broad categories like grassland, agriculture, and built-up areas.
- Land Cover 73-Class: Provides more detailed classifications, distinguishing between various types of vegetation, including natural grasslands, cultivated lands, and other land uses.
- Land Cover 24-Class: Offers a finer resolution with specific categories such as natural grassland, shrubland, and sparse vegetation.

In terms of detailed classification, the project site falls under:

- Class: Natural Grassland
- Classification Level 1: Grassland
- Classification Level 2: Natural Grassland

These classifications reflect the region's predominantly grassland landscape, which is adapted to the semi-arid conditions with limited vegetation diversity (DFFE, 2022).

The region's vegetation is adapted to the low rainfall and high evaporation rates, with dominant plant species including xerophytic grasses and drought-resistant shrubs. Agricultural activities, particularly livestock grazing and dryland farming, are also common, influencing land cover patterns. The presence of natural vegetation and agricultural use contributes to the region's overall landscape, with minimal forested areas or extensive water bodies (Jones, 2023).

8.1.7 Soils

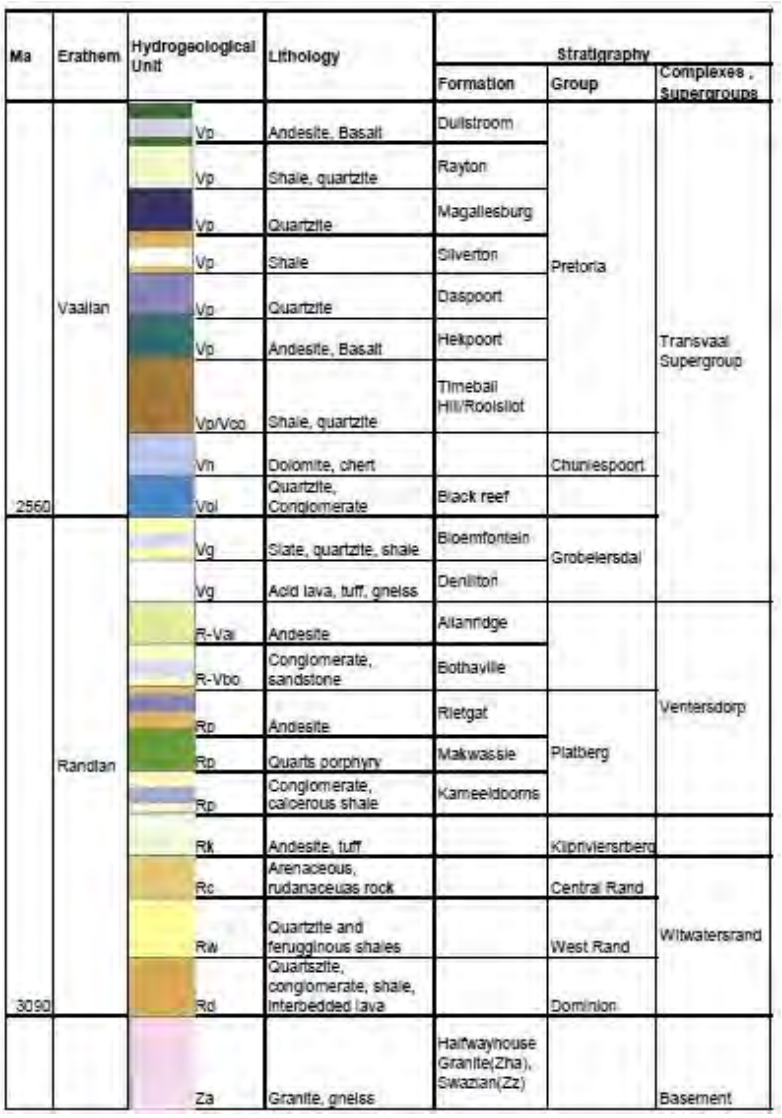
The soils in the project area are predominantly sandy to sandy loams, typical of semi-arid regions. These soils are often characterized by low organic matter content and limited water-holding capacity, which is consistent with the area's high evaporation rates and low precipitation. Soil profiles in the region generally include shallow horizons with a limited depth of fertile topsoil. The soil types support the sparse vegetation and are used for grazing and dryland agriculture (Department of Agriculture, 2022).

8.1.8 Geology

8.1.8.1 Regional geology

The regional (Klerksdorp–Orkney–Stilfontein-Hartbeesfontein (KOSH)) geological composition of the study area is predominantly influenced by several major formations. The primary lithologies include those from the Pretoria and Chuniespoort Formations within the Transvaal Supergroup, as well as those from the Witwatersrand and Ventersdorp Supergroups. Additionally, substantial regions are underlain by Swazian-age basement rocks, primarily consisting of granites and gneisses. More recent geological deposits are less prevalent but include some Karoo rocks from the Ecca Group, particularly to the north of Klerksdorp. Quaternary alluviums along the principal rivers and streams in the area cover a small portion of the total land (Veltman, 2004).

Structurally, the area exhibits significant faulting, especially within the Witwatersrand sequences, where faults are predominantly oriented north-east/south-west. These are mostly normal faults with downthrows directed either towards the north-west or the south-east. Faulting that occurred after the Ventersdorp and Transvaal periods is notable, although faulting from the Post-Karoo period is relatively limited. Major dyke intrusions in the region include those that occurred after the Klipriviersberg, Transvaal, and Karoo periods. These intrusions include quartz diabase, ilmenite diabase, carbonatite, lamprophyres, and finally Pilanesberg and Karoo dolerites (Veltman, 2004).



Ma	Erathem	Hydrogeological Unit	Lithology	Stratigraphy		
				Formation	Group	Complexes , Supergroups
	Vaalian	Vp	Andesite, Basalt	Duitstroom	Pretoria	Transvaal Supergroup
		Vp	Shale, quartzite	Rayton		
		Vp	Quartzite	Magaliesburg		
		Vp	Shale	Silverton		
		Vp	Quartzite	Daspoort		
		Vp	Andesite, Basalt	Hekpoort		
		Vp/Vco	Shale, quartzite	Timeball Hill/Rooisloot		
		Vh	Dolomite, chert		Chuniespoort	
2560		Vbl	Quartzite, Conglomerate	Black reef		
	Randian	Vg	Slate, quartzite, shale	Bloemfontein	Grobelersdal	Ventersdorp
		Vg	Acid lava, tuff, gneiss	Denliton		
		R-Va	Andesite	Allanridge	Platberg	
		R-Vbo	Conglomerate, sandstone	Bothaville		
		Rp	Andesite	Rietgat		
		Rp	Quarts porphyry	Makwassie		
		Rp	Conglomerate, calcerous shale	Kameeldoorns		
		Rk	Andesite, tuff		Klipriviersrberg	
		Rc	Arenaceous, rudanaceuas rock		Central Rand	Witwatersrand
		Rw	Quartzite and ferrugginous shales		West Rand	
3090		Rd	Quartszite, conglomerate, shale, interbedded lava		Dominion	
		Za	Granite, gneiss	Halfwayhouse Granite(Zha), Swazian(Zz)		Basement

Figure 8-3: General geology in the KOSH area (Veltman, 2004).

8.1.8.2 Site specific geology

The project site is situated in a region with a diverse geological composition, reflecting a complex history of sedimentation, volcanic activity, and metamorphism. The geological units and formations described for the project site fall within several distinct geological basins. The site geology can be classified into several distinct lithostratigraphic units, each characterized by specific lithologies:

- Undifferentiated Tonalite, Granite, and Gneiss
- Hospital Hill Subgroup
- Government Subgroup

- Dominion Group
- Klipriviersberg Group
- Rietgat Formation
- Alluvium, Colluvium, Eluvium, Gravel, Scree, Sand, Soil, Debris

8.1.8.2.1 Undifferentiated Tonalite, Granite, and Gneiss

These units are generally part of the Archean cratonic basement, specifically the Kaapvaal Craton. This craton forms the stable geological core of southern Africa and underlies several younger sedimentary basins. The undifferentiated tonalite, granite, and gneiss) comprises potassic gneiss and migmatite, which are notably porphyroblastic. This classification indicates high-grade metamorphic processes where original igneous or sedimentary rocks have been transformed under intense pressure and temperature conditions. The presence of porphyroblastic textures signifies significant metamorphism, reflecting a stable and long-lasting geological environment.

8.1.8.2.2 Hospital Hill Subgroup

The Hospital Hill Subgroup is part of the Witwatersrand Basin. The Hospital Hill Subgroup, is predominantly composed of fine- to medium-grained quartzite, shale, and magnetic shale. This subgroup represents a significant sedimentary sequence where quartzite indicates the historical processes of sediment compression and cementation. Shales in this unit suggest periods of slower sedimentation, with the presence of magnetic shale indicating mineralogical changes influenced by volcanic or tectonic activities. These rock types typically form in ancient sedimentary environments where fine particles settle and accumulate over time.

8.1.8.2.3 Government Subgroup

The Government Subgroup is also part of the Witwatersrand Basin. This subgroup represents sedimentary sequences deposited during the Archean period. The Government Subgroup includes quartzite, shale, and minor conglomerate. This subgroup reflects a sedimentary sequence characterized by the dominance of quartzite, indicative of ancient sand deposits that have undergone significant geological compression. The inclusion of shale suggests quieter depositional environments where fine sediments accumulated, while the minor conglomerate represents periods of higher sedimentary energy.

8.1.8.2.4 Dominion Group

The Dominion Group is associated with the Dominion Basin, which is an early Proterozoic sedimentary and volcanic sequence overlying the Archean basement rocks. This group is significant for its volcanic and sedimentary interactions. The Dominion Group includes a diverse range of volcanic and sedimentary rocks such as basaltic andesite, quartz-feldspar porphyry, amygdaloidal andesite, tuff, conglomerate, and quartzite. This group reflects a dynamic geological history with extensive volcanic activity, as indicated by the various volcanic rock types, and sedimentary processes represented by conglomerate and quartzite. This diversity highlights the complex interplay between volcanic eruptions and sedimentation in shaping the region's geology.

8.1.8.2.5 Klipriviersberg Group

The Klipriviersberg Group is part of the Ventersdorp Supergroup within the Ventersdorp Basin. This group represents a series of volcanic rocks deposited during extensive volcanic activity in the late Archean to early Proterozoic periods. The Klipriviersberg Group is characterized by tholeiitic basalt, andesite, basalt, tuff, and agglomerate. This group represents significant volcanic activity, with tholeiitic basalt and andesite indicating various phases of volcanic eruptions. The presence of tuff and agglomerate points to explosive volcanic events and the deposition of volcanic fragments, illustrating a dynamic volcanic history

8.1.8.2.6 Rietgat Formation

The Rietgat Formation is associated with the Ventersdorp Supergroup, which forms part of the Ventersdorp Basin. This basin is characterized by extensive volcanic and sedimentary sequences resulting from volcanic activity in the Archean era. The Rietgat Formation, is characterized by a mix of andesite to dacitic volcanic rocks, with minor occurrences of conglomerate, greywacke, and shale. This formation indicates a period of significant volcanic activity, with andesite and dacite suggesting varied volcanic eruptions. The presence of conglomerate and greywacke points to periods of high-energy sedimentation, where volcanic and sedimentary processes interacted to form a complex geological environment.

8.1.8.2.7 Alluvium, Colluvium, Eluvium, Gravel, Scree, Sand, Soil, Debris

These unconsolidated surface deposits are not confined to a specific geological basin but are widespread across various regions, including those influenced by recent geological processes. They are found in river valleys, floodplains, and regions undergoing active erosion and deposition. The classification consists a range of surface deposits including alluvium, colluvium, and eluvium, along with gravel, scree, sand, soil, and debris. These materials are products of erosional and depositional processes that have accumulated over time. Alluvium and colluvium are transported by water and gravity, respectively, while eluvium refers to materials weathered in situ. The presence of gravel, scree, and sand reflects varying degrees of weathering and sediment transport, providing insight into recent geological activity and landscape evolution.

According to the geological map, the underlying rock types present within the prospecting area include:

Qs - Soil Cover: The most superficial unit in the area is the Qs, which represents unconsolidated soil cover. This layer consists of loose, uncemented material that typically results from weathering processes acting on underlying rock formations. It does not belong to any specific geological formation or group and is generally indicative of the most recent geological processes in the area, such as erosion, sediment deposition, and soil formation. This layer may contain a mix of organic material, clay, silt, sand, and gravel, depending on local environmental conditions.

Rg - Quartzite, Greywacke, Conglomerate, Shale, Tillite, Hornfels: The Rg unit is composed of a variety of sedimentary and metamorphic rocks, indicating a complex geological history. Quartzite is a hard, metamorphosed sandstone, known for its durability and resistance to weathering. Greywacke is a type of sandstone containing a mix of sand-sized grains and finer materials, often formed in turbidity currents in deep marine settings. Conglomerate consists of rounded clasts cemented together, often indicating deposition in high-energy environments such as river channels. Shale is a fine-grained sedimentary rock formed from mud or clay, typically deposited in calm, low-energy environments such as deep water basins. Tillite is a type of sedimentary rock formed from glacial till, indicating past glaciation events. Hornfels is a fine-grained metamorphic rock formed by contact metamorphism, typically resulting from the intrusion of hot magma into cooler surrounding rock. The presence of these

rocks suggests a history of significant sedimentation, tectonic activity, and metamorphism in the area, likely associated with the Ventersdorp or Witwatersrand Supergroups.

R-Vr - Amygdaloidal Lava, Agglomerate, Tuff: The R-Vr unit is dominated by volcanic rocks, including amygdaloidal lava, agglomerate, and tuff. Amygdaloidal lava is a type of volcanic rock that contains rounded, almond-shaped cavities (amygdules) filled with secondary minerals such as quartz or calcite. Agglomerate is a coarse-grained volcanic rock composed of volcanic fragments cemented together, indicating explosive volcanic activity. Tuff is a pyroclastic rock formed from volcanic ash, which has been compacted and lithified. The presence of these volcanic rocks suggests that the area experienced significant volcanic activity during its geological history, possibly related to the Ventersdorp Supergroup, which is known for its extensive volcanic sequences.

Va - Basaltic Amygdaloidal Lava: The Va unit represents a type of basaltic lava characterized by the presence of amygdules. Basalt is a fine-grained, dark-colored volcanic rock rich in iron and magnesium. The amygdaloidal texture indicates that gas bubbles were trapped in the lava as it solidified, later becoming filled with secondary minerals. This type of lava is typically associated with extensive volcanic activity and is often found in large, ancient lava flows. The presence of basaltic lava in the area suggests a period of widespread volcanic activity, likely linked to the same tectonic processes that produced the volcanic rocks in the R-Vr unit.

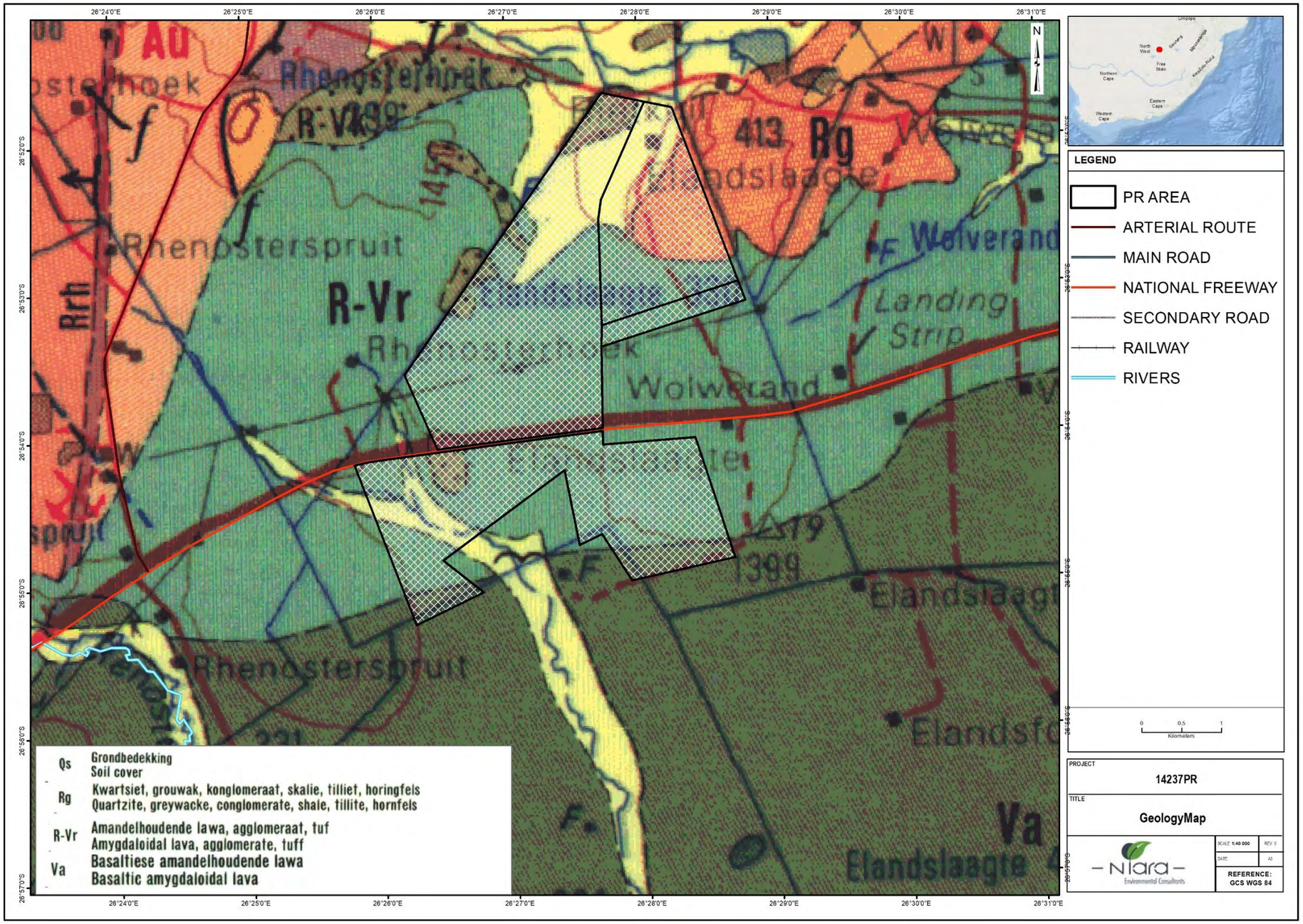


Figure 8-4: Geological map

8.1.9 Geohydrology

The study area comprises two distinct aquifer systems, each with unique characteristics that influence their hydrological behaviour and groundwater availability. These systems are categorized as follows:

- Fractured Aquifer System; and
- Intergranular and Fractured Aquifer System

8.1.9.1 Fractured Aquifer System

The fractured aquifer system typically features groundwater movement through fractures and joints within the host rock. This type of aquifer is generally associated with crystalline rocks or sedimentary formations that have undergone significant tectonic activity, leading to the development of secondary porosity. The fractured aquifer system in the study area exhibits a hydraulic conductivity range of 0.5 to 2.0 liters per second (l/s). This range reflects the variability in fracture density and connectivity, which can affect groundwater flow and storage.

The yield of this aquifer system is dependent on the extent and connectivity of the fractures. Wells tapping into fractured aquifers can have variable discharge rates, but typical yields in the study area fall within the 0.5 to 2.0 l/s range. The vulnerability of the fractured aquifer system is moderate due to the potential for rapid contamination transport through fractures, though natural processes can mitigate some risks. This system is more susceptible to contamination and over-extraction due to the presence of fractures which can act as conduits for pollutants.

8.1.9.2 Intergranular and Fractured Aquifer System

This aquifer system combines intergranular porosity, where groundwater is stored in the spaces between grains in unconsolidated sediments or sedimentary rocks, with fractured porosity. The presence of both types of porosity can enhance the overall groundwater storage and flow capacity. The hydraulic conductivity for this combined system also ranges between 0.5 to 2.0 l/s. The intergranular component provides a steady base flow, while the fractured component can contribute to higher, albeit less predictable, yields.

The combined intergranular and fractured aquifer system benefits from the contributions of both porosity types, leading to yields within the 0.5 to 2.0 l/s range. This system is typically more resilient to fluctuations in recharge and can provide a more consistent water supply compared to systems with a single porosity type. The intergranular and fractured aquifer system has a moderate vulnerability level, with both the intergranular and fractured components potentially being affected by contamination.

The susceptibility of this system is medium-high due to the combined effects of intergranular and fractured porosity, which can facilitate the transport of contaminants and impact groundwater quality.

8.1.10 Critical Biodiversity Areas

The Critical Biodiversity Areas (CBA) within the study region are categorized into three levels, each depicted with distinct colours on the map (see Figure 8-3):

- CBA 1 areas: Represent the highest conservation priority and are critical for maintaining ecosystem processes and species of high conservation concern. These areas are primarily located in the northern and southern parts of the study area.
- CBA 2 regions: Also of significant conservation value, though slightly less critical than CBA 1 areas. These regions are distributed more broadly across the central and southeastern parts of the mapped area.
- CBA 0 areas: Serve as supporting zones that complement the core biodiversity areas by maintaining ecological processes and providing habitat connectivity.

The identification and delineation of these critical biodiversity areas highlight their importance in biodiversity conservation and the necessity of strategic planning to protect these vital ecosystems. Large parts of the CBA1 area within the PRA has been affected by ploughing and development of pivot irrigation infrastructure.

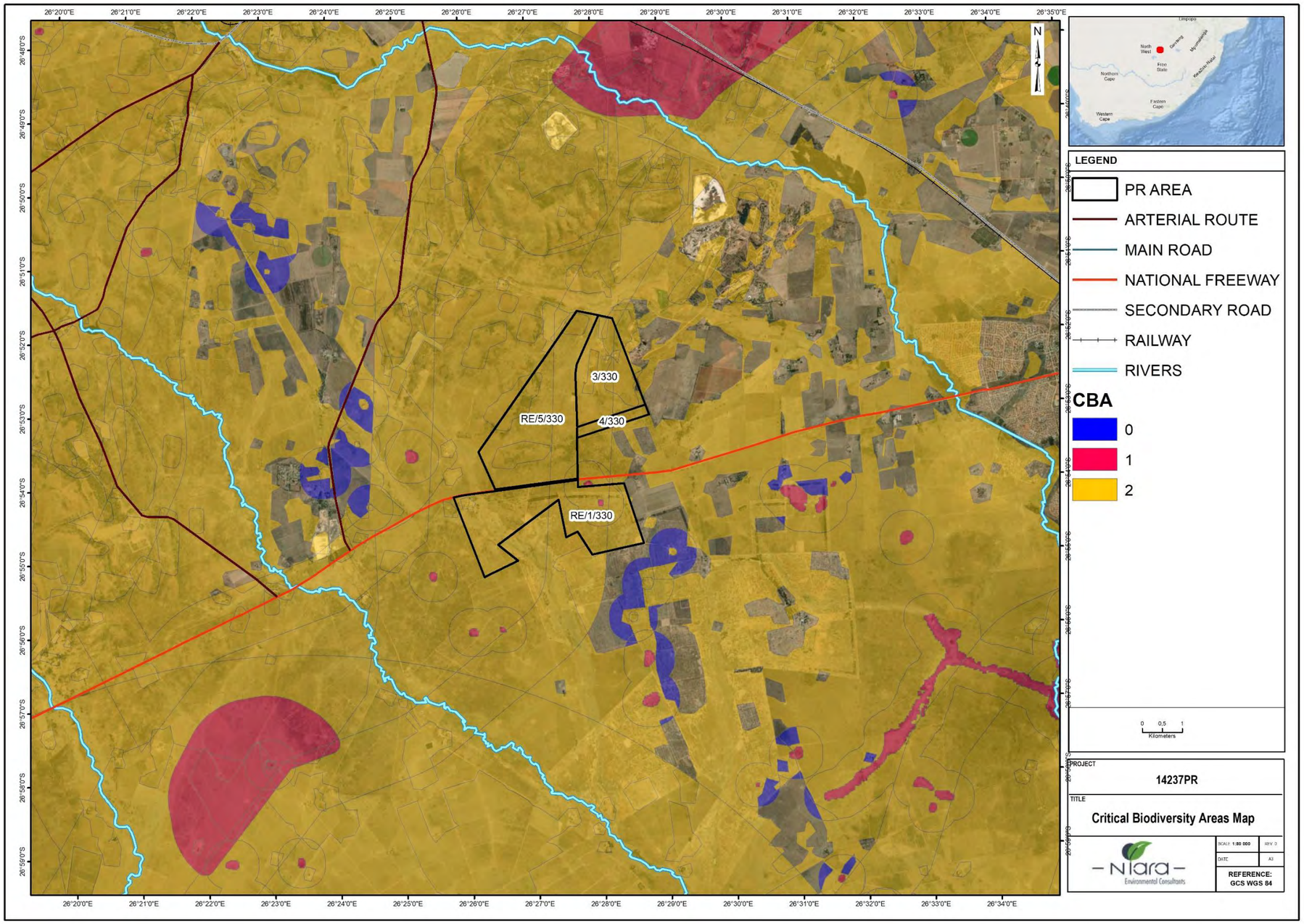


Figure 8-5: CBA Map

8.1.11 Wetland Classification and Distribution

For the purpose of the baseline assessment, we identified wetlands using the NFEPA wetland dataset. The study area contains a diverse array of wetland types, as identified on the NFEPA Wetland Area Map (see Figure Error! Reference source not found.8-3) although the dataset did not identify any NFEPA wetlands on the Application Site. These include:

- Channelled valley-bottom wetlands: Typically associated with fluvial processes.
- Depressions: Areas where water accumulates in low-lying regions.
- Flat wetlands: Level regions where water may stagnate.
- Floodplain wetlands: Occur alongside rivers and are influenced by periodic flooding.
- Seep wetlands: Areas where groundwater surfaces, often on hillslopes.
- Unchanneled valley-bottom wetlands: Differ from their channelled counterparts by lacking defined stream channels.
- Valley head seeps: Located at the heads of valleys where groundwater emerges.

This classification of NFEPA wetlands and rivers in the wider study area underscores the ecological variability within the study area, highlighting the importance of these wetland ecosystems in maintaining hydrological and ecological balance. No NFEPA wetlands or rivers affect the Application area directly.

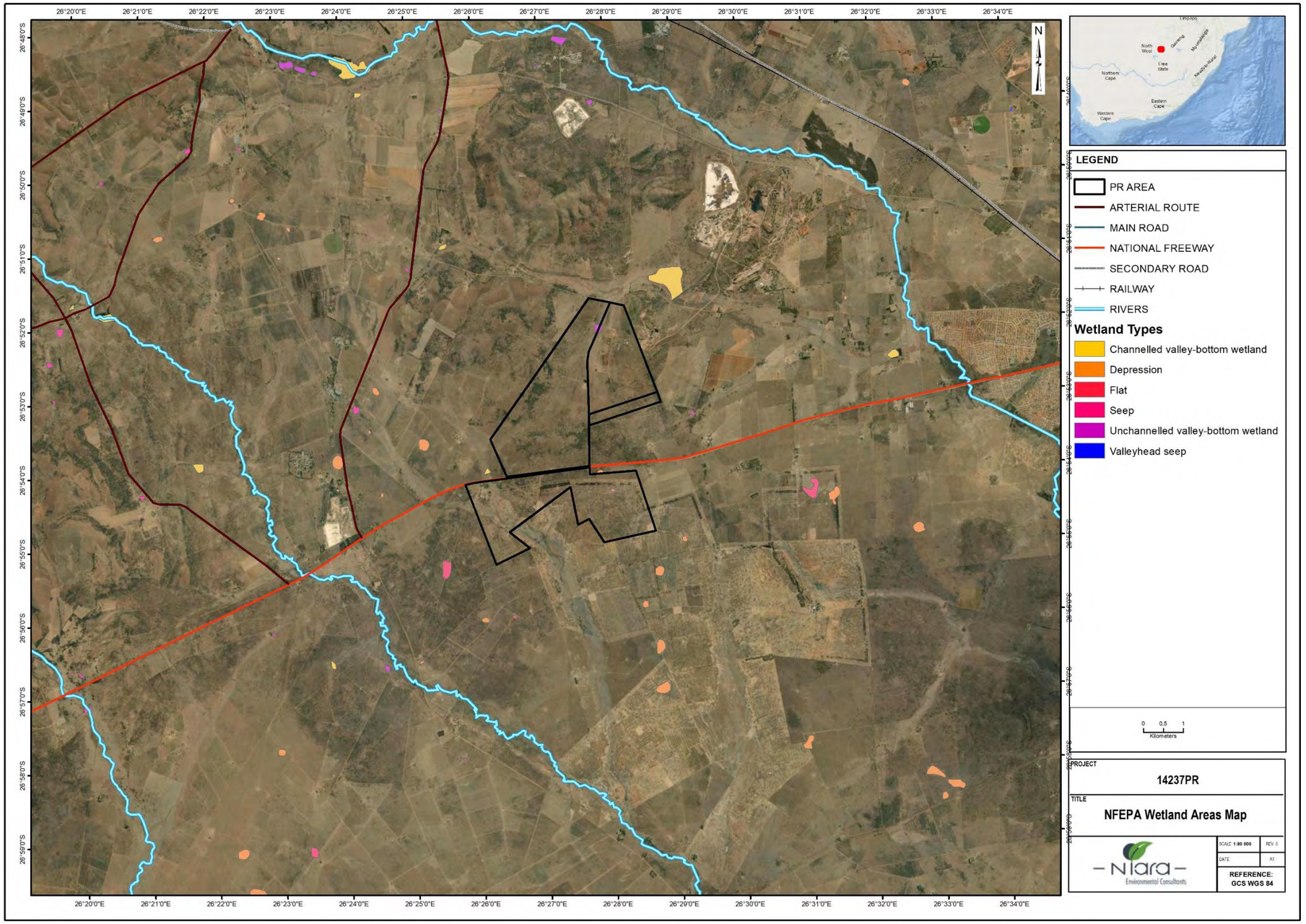


Figure 8-6: NFEPA Wetland Area

The National Water Act, Act 36 of 1998, defines wetlands as: "Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil."

The presence of wetlands in the landscape can be linked to surface water and perched groundwater tables. Wetland types are differentiated based on their hydro-geomorphic (HGM) characteristics; i.e. on the position of the wetland in the landscape, as well as the way in which water moves in, through and out of the wetland systems as indicated in Table 8- 2 below. A schematic diagram of how these wetland systems is positioned in the landscape is given in the Figure 8-7 below.

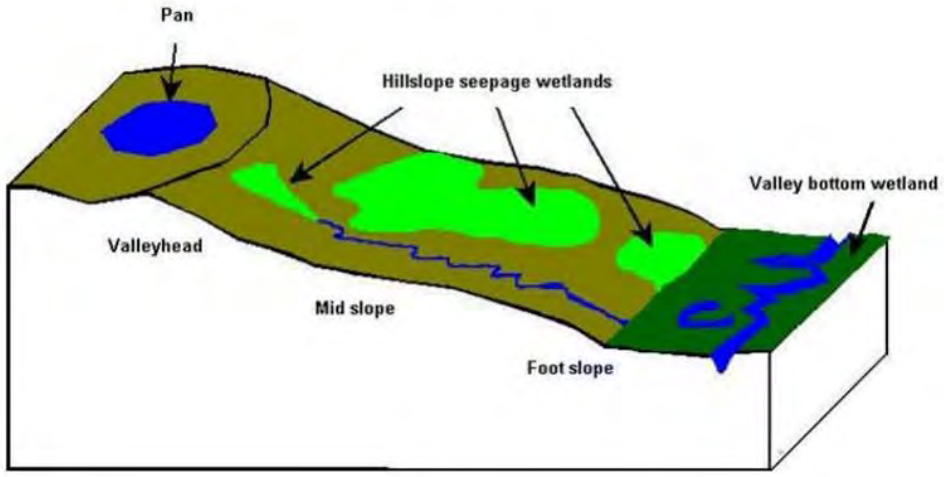


Figure 8-7: Diagram illustrating the position of the various wetland types within the landscape

Table 8-2: Wetland Hydrogeomorphic units (modified from Brinson 1993; Kotze 1999 and Marneweck and Batchelor 2002)

Wetland type	Position in the landscape	Description
Floodplain		Valley bottom areas with a well-defined stream channel, gently sloped and characterized by floodplain features such as oxbow depression 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 the main

Wetland type	Position in the landscape	Description
		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 the channel entering the wetland and also from adjacent slopes
Hillslope seepage linked to a stream channel.		Slopes on hillsides, which are characterized by colluvial (transported by gravity) movement of materials. Water inputs are mainly from subsurface 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 that are characterized by colluvial transport (transported by gravity) movement of materials. Water inputs are from subsurface flow and outflow either very limited or through diffuse sub-surface flow but with no direct link to a surface water channel.
Pan/Depression		A basin-shaped area with a closed elevation contour that allows for the accumulation of surface water (ie. It is inward draining). It may also receive subsurface water. An outlet is usually absent and so this type of wetland is usually isolated from the stream network.

8.1.12 Socio-economic

8.1.12.1 North West Province

The North West Province, located in the northwestern part of South Africa, is a region rich in mineral resources and agricultural potential. The province spans approximately 104,882 square kilometers and is home to a population of over 4 million people. The North West Province's economy is heavily reliant on mining, particularly platinum, gold, and uranium. The province hosts some of the largest mining operations in the world, with companies such as Anglo American and Impala Platinum operating extensively in the region. Much of the province consists of flat areas of scattered trees and grassland. The Vaal River flows along the southern border of the province. Mahikeng (previously Mafikeng) is the capital. The city lies near the Botswana border and forms a single urban area

with its neighbouring town, Mmabatho. Potchefstroom and Klerksdorp are the biggest cities in the province. Other main towns are Brits, Rustenburg, Klerksdorp and Lichtenburg.

Agriculture is another significant sector in the province, with activities ranging from maize and sunflower farming to cattle and poultry farming. Despite the economic contributions from mining and agriculture, the province faces challenges such as unemployment, poverty, and inequality. The provincial government has implemented various programs aimed at improving infrastructure, education, and healthcare to address these challenges. The province is also culturally diverse, with a rich heritage that includes the Tswana, Afrikaans, and English-speaking communities.

Most economic activity is concentrated in the southern region between Potchefstroom and Klerksdorp, as well as Rustenburg and the eastern region. Mining is the major contributor to the North West economy and represents almost a quarter of South Africa's mining industry as a whole. The Rustenburg and Brits districts produce more platinum than any other single area in the world. North West also produces a quarter of South Africa's gold, as well as granite, marble, fluorspar and diamonds. North West has a number of major tourist attractions, including the internationally famous Sun City, the Pilanesberg National Park, the Madikwe Game Reserve and the Rustenburg Nature Reserve. North West is well known for cattle farming, while the areas around Rustenburg and Brits are fertile, mixed-crop farming land. Maize and sunflowers are the most important crops, and the province is the major producer of white maize in the country.

North West is divided into four district municipalities, which are further subdivided into 18 local municipalities, namely:

- Bojanala Platinum District:
  - Kgetlengrivier Local Municipality.
  - Madibeng Local Municipality.
  - Moretele Local Municipality.
  - Moses Kotane Local Municipality.
  - Rustenburg Local Municipality.
- Dr Kenneth Kaunda District:
  - City of Matlosana Local Municipality.
  - JB Marks Local Municipality.
  - Maquassi Hills Local Municipality.
- Dr Ruth Segomotsi Mompati District:
  - Greater Taung Local Municipality.
  - Kagisano-Molopo Local Municipality.

- Lekwa-Teemane Local Municipality.
- Mamusa Local Municipality.
- Naledi Local Municipality.

- Ngaka Modiri Molema District:
  - Ditsobotla Local Municipality.
  - Mahikeng Local Municipality.
  - Ramotshere Moiloa Local Municipality.
  - Ratlou Local Municipality.
  - Tswaing Local Municipality.

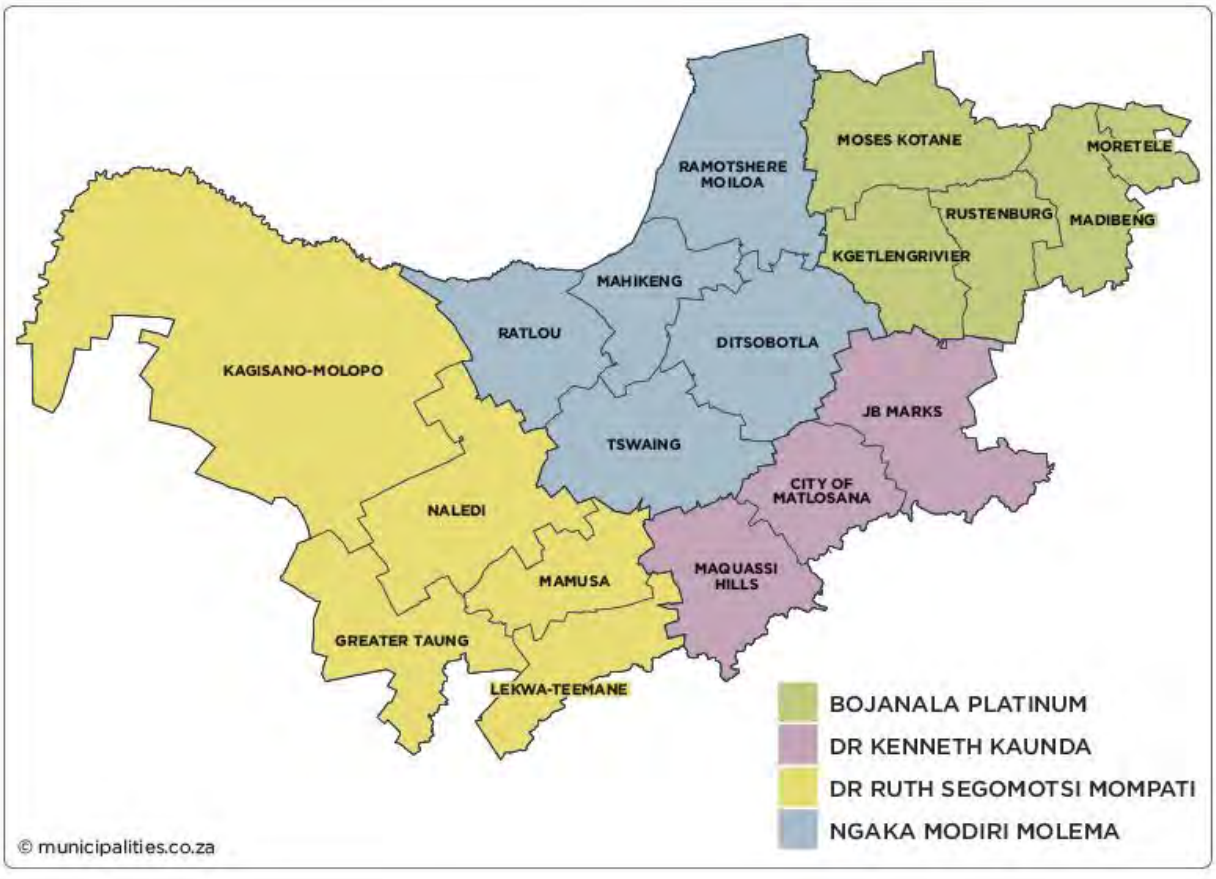


Figure 8-8: North West Province and its Municipalities

Table 8-3: North West Province Key Statistics

Name	2022	2011
Total population	3 804 548	3 509 953
Young children (0-14 years)	28.30%	29.60%
Working age population (15-64 years)	65.50%	64.70%
Elderly (65+ years)	6.20%	5.60%
Dependency ratio	52.7	54.5
Sex ratio	98.2	102.9
No schooling (20+ years)	7.90%	11.80%
Higher education (20+ years)	7.50%	7.40%
Number of households	1 141 291	1 061 998
Average household size	3.3	3.3
Formal dwellings	88.00%	76.20%
Flush toilets connected to sewerage	58.50%	45.40%
Weekly refuse disposal service	53.50%	48.70%
Access to piped water in the dwelling	43.30%	29.30%
Electricity for lighting	93.90%	84.00%

8.1.12.2 Dr Kenneth Kaunda District Municipality

The Dr Kenneth Kaunda District Municipality is one of the four district municipalities in the North West Province. It covers an area of approximately 14,767 square kilometers and includes three local municipalities: City of Matlosana, Tlokwe, and Maquassi Hills. The district is named in honor of Dr. Kenneth Kaunda, the first President of Zambia, recognizing his contributions to the liberation struggles in Southern Africa.

The district's economy is driven largely by mining, agriculture, and manufacturing. The mining sector, particularly gold and uranium, plays a crucial role in the district's economy, providing employment opportunities and contributing to the local GDP. Agriculture is also prominent, with maize, sunflowers, and livestock farming being the most common activities. The manufacturing sector, though smaller, includes the production of food products, beverages, and fabricated metal products.

It is a region with a rich and diverse natural and cultural heritage, with the potential for sustained economic growth. The region is home to some of the most prominent gold mines in the world and one of the oldest meteor impact sites in the world. The district is serviced by a number of primary roads, with the N12 Treasure Corridor forming the main development axis in the district and serving as a potential concentration point for future industrial, commercial and tourism development.

Despite its economic strengths, the district faces significant socio-economic challenges, including high levels of unemployment and poverty. The district government has been focusing on improving infrastructure, healthcare, and education to enhance the quality of life for its residents. Additionally, efforts have been made to diversify the economy and reduce its dependency on mining, which has been subject to global market fluctuations.

Figure 8-9: Dr Kenneth Kaunda DM

Table 8-4: Dr Kenneth Kaunda District Key Statistics

Dr Kenneth Kaunda District Key Statistics			
Name	2022	2016	2011
Population	734 203	742 821	695 933
Age Structure			
Population under 15	26.8%	29.3%	28.5%
Population 15 to 64	66.8%	65.8%	66.0%
Population over 65	6.5%	4.8%	5.5%
Dependency Ratio			
Per 100 (15-64)	49.7	51.9	51.5
Sex Ratio			
Males per 100 females	93.9	100.7	99.6
Population Growth			
Per annum	0.52%	1.48%	n/a
Labour Market			
Unemployment rate (official)	n/a	n/a	29.7%
Youth unemployment rate (official) 15-34	n/a	n/a	39.2%
Education (aged 20 +)			
No schooling	6.9%	8.9%	10.0%
Matric	n/a	30.7%	26.8%
Higher education	9.2%	9.6%	9.1%
Household Dynamics			

Dr Kenneth Kaunda District Key Statistics			
Name	2022	2016	2011
Households	220 146	240 543	208 045
Average household size	3.3	3.1	3.3
Female headed households	n/a	37.0%	36.6%
Formal dwellings	89.3%	86.4%	81.4%
Housing owned	n/a	56.6%	56.0%
Household Services			
Flush toilet connected to sewerage	88.3%	87.7%	86.7%
Weekly refuse removal	78.7%	79.9%	75.3%
Piped water inside dwelling	58.4%	45.9%	47.9%
Electricity for lighting	92.1%	91.1%	88.6%

The Main Economic Sectors include community services (28.7%), trade, (23.2%), finance (13.1%), construction (8.3%), manufacturing (8.2%), agriculture (7.6%), mining (6.1%), transport and communications (4.3%).

Dr Kenneth Kaunda District Municipality comprises:

- City of Matlosana Local Municipality.
- JB Marks Local Municipality.
- Maquassi Local Municipality.

8.1.12.3 City of Matlosana

The City of Matlosana, formerly known as Klerksdorp, is the largest urban center within the Dr Kenneth Kaunda District Municipality. It encompasses the towns of Klerksdorp, Orkney, Stilfontein, and Hartebeesfontein. The city is historically significant as one of the oldest mining towns in South Africa, with its gold mines dating back to the late 19th century. The mining industry remains a cornerstone of Matlosana's economy, although many mines have closed or scaled down operations in recent years due to resource depletion and economic shifts.

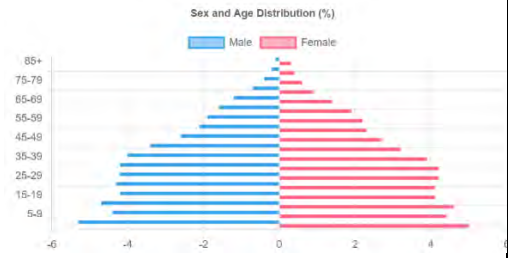
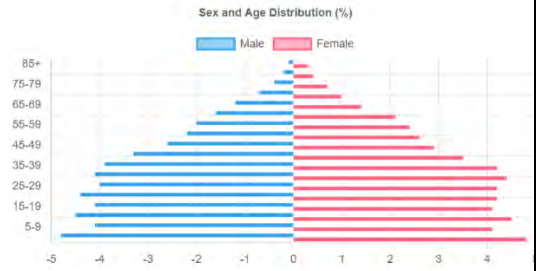
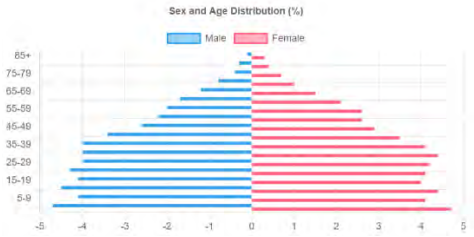
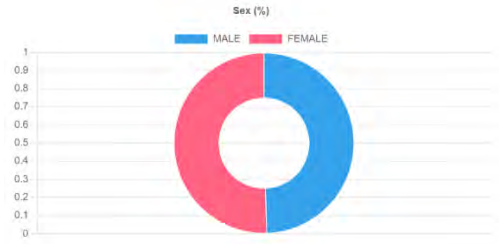
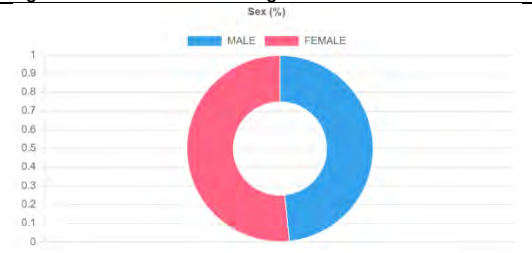
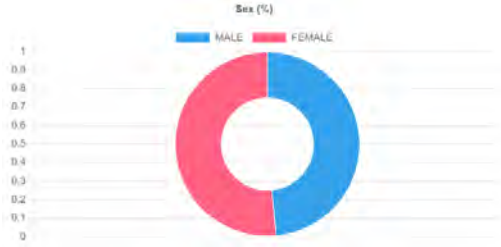
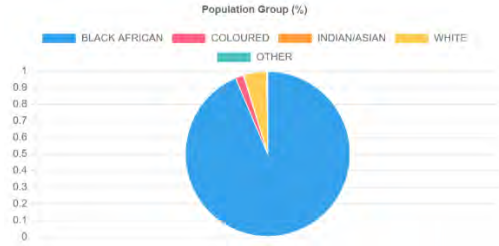
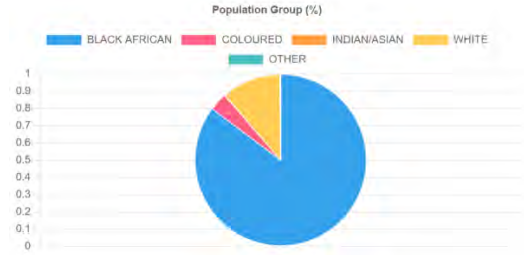
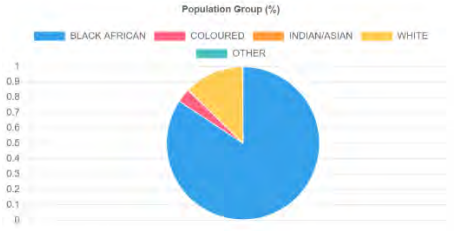
The population of Matlosana is diverse, with a mixture of urban and rural communities. The city is home to over 400,000 residents, many of whom are employed in the mining, manufacturing, and service sectors. The local economy has faced challenges due to the decline in gold mining, leading to job losses and economic contraction. However, the municipality has been working on revitalizing the local economy through initiatives aimed at developing small and medium enterprises (SMEs), promoting tourism, and attracting new industries.

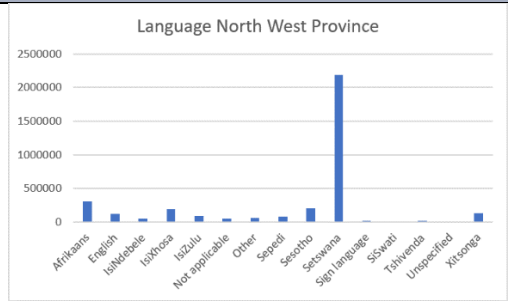
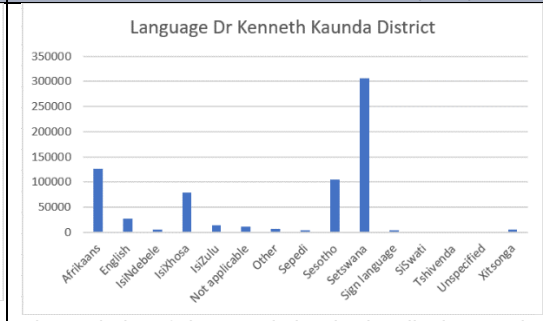
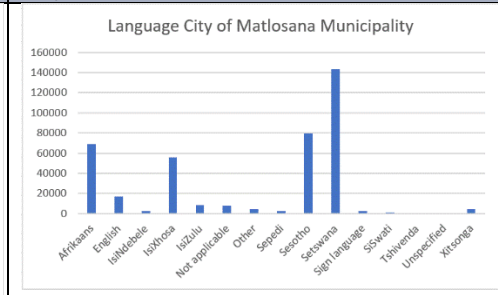
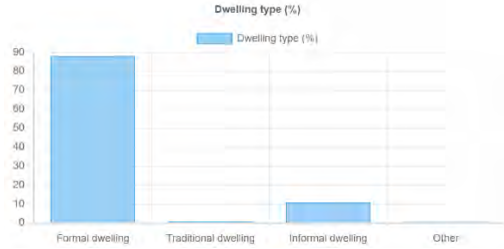
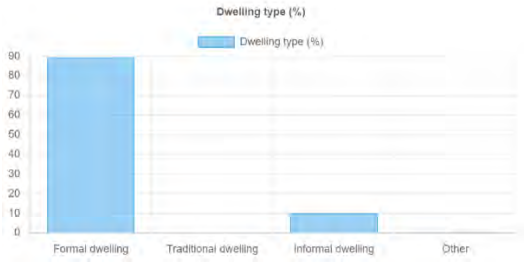
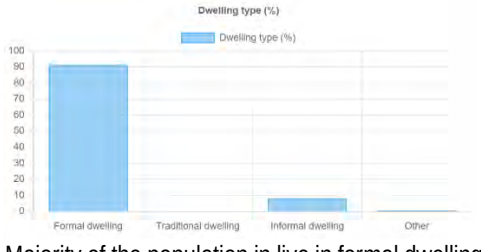
Socially, the City of Matlosana faces issues such as poverty, crime, and a shortage of housing. The municipality has prioritized social development programs, including upgrading informal settlements, improving access to basic services like water and electricity, and enhancing educational facilities. The healthcare system in Matlosana is also a focal point for improvement, with efforts being made to expand healthcare access and address public health challenges, including HIV/AIDS and tuberculosis.

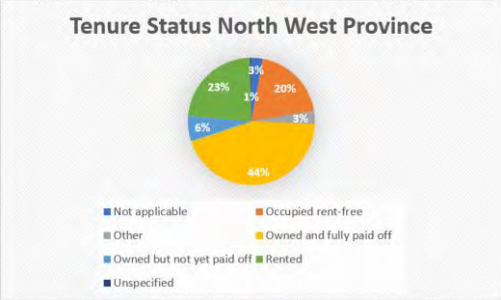
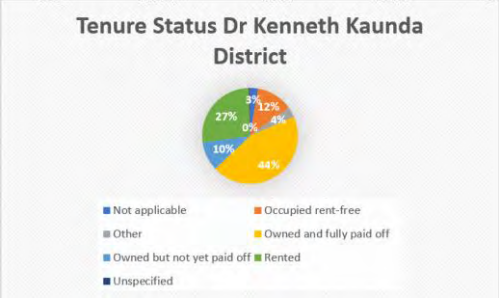
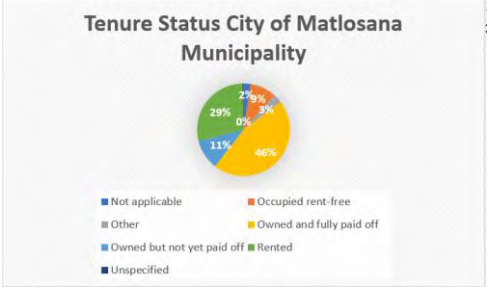
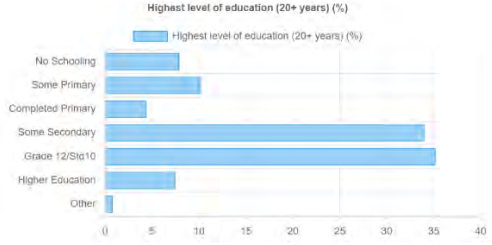
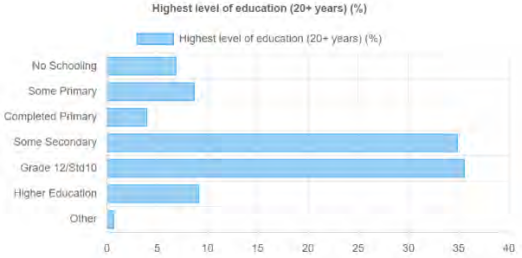
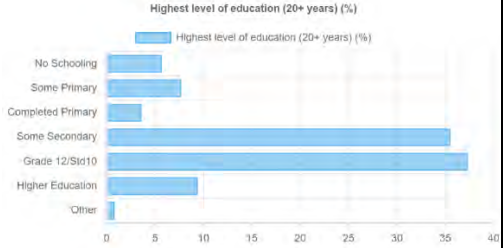
Overall, while the City of Matlosana has experienced economic hardships, it remains a vital part of the North West Province's economic landscape. The city is gradually transitioning from its reliance on mining to a more diversified economy, with a focus on sustainable development and improving the living conditions of its residents.

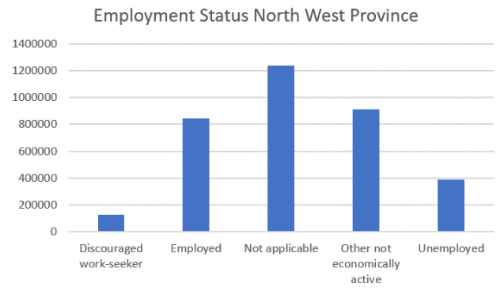
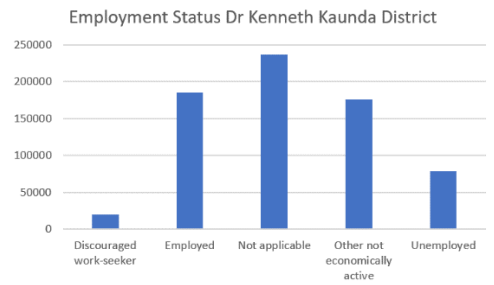
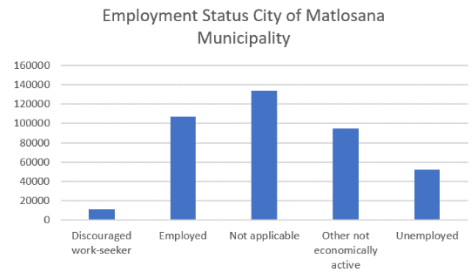
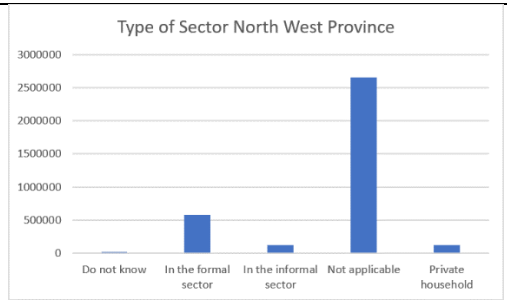
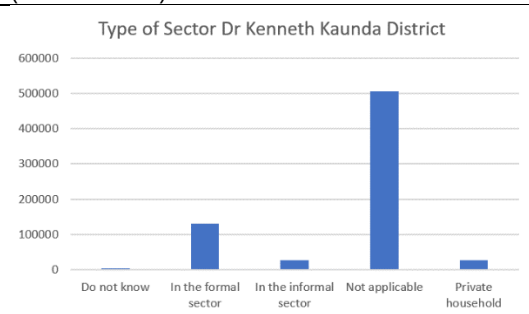
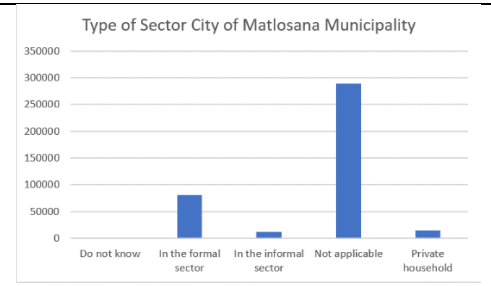
Table 8-5: City of Matlosana Local Municipality Key Statistics

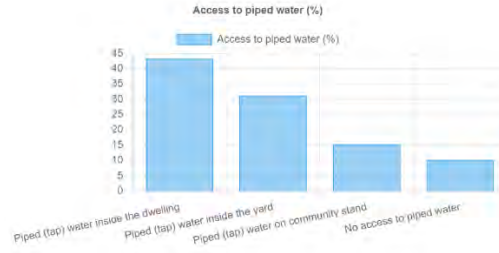
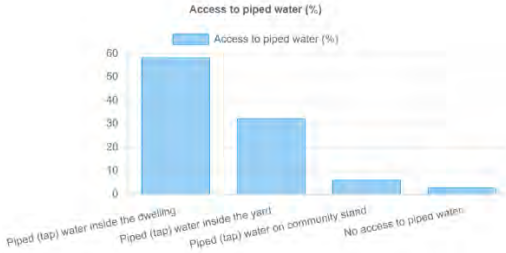
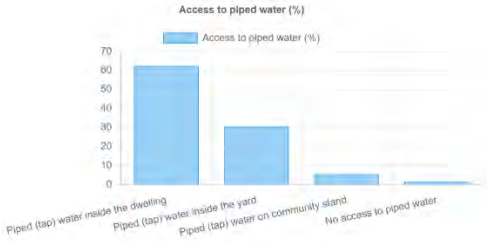
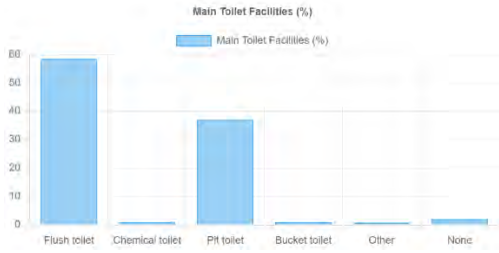
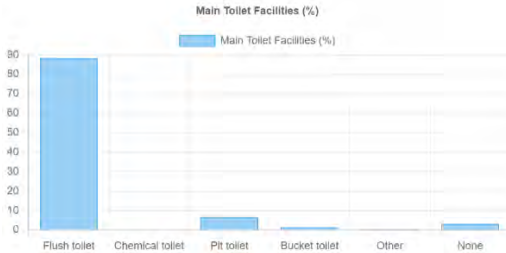
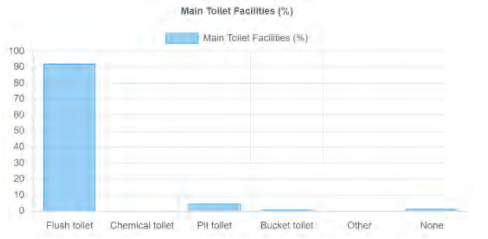
City of Matlosana Local Municipality Key Statistics			
Name	2022	2016	2011
Population	431 231	417 282	398 676
Age Structure			
Population under 15	26.5%	29.1%	28.2%
Population 15 to 64	66.8%	66.0%	66.4%
Population over 65	6.7%	4.9%	5.4%
Dependency Ratio			
Per 100 (15-64)	49.7	51.5	50.7
Sex Ratio			
Males per 100 females	94.1	100.2	100.0
Population Growth			
Per annum	0.76%	1.04%	n/a
Labour Market			
Unemployment rate (official)	n/a	n/a	32.7%
Youth unemployment rate (official) 15-34	n/a	n/a	43.1%
Education (aged 20 +)			
No schooling	5.7%	7.9%	7.9%
Matric	n/a	32.1%	28.2%
Higher education	9.4%	8.9%	8.6%
Household Dynamics			
Households	128 359	135 894	120 441
Average household size	3.4	3.1	3.3
Female headed households	n/a	37.6%	36.7%
Formal dwellings	91.2%	89.2%	82.9%
Housing owned	n/a	58.3%	57.9%
Household Services			
Flush toilet connected to sewerage	92.3%	95.1%	94.2%
Weekly refuse removal	86.4%	91.6%	89.3%
Piped water inside dwelling	62.4%	48.7%	50.1%
Electricity for lighting	92.9%	94.3%	90.3%

SECONDARY ZONE			
Demographic Aspect	North West Province	Dr Kenneth Kaunda District Municipality	City of Matlosana
Age 	 The populous age group in the province is between ages 00 to 04. Followed Ages between 15 to 19.	 The populous age group in the district is between ages 00 to 04. Followed Ages between 15 to 19.	 The populous age group is between ages 00 to 04. Followed Ages between 15 to 19.
Gender 	 There are slightly more females (50,5%) than males (49,5%).	 There are slightly more females (51,6%) than males (48,4%).	 There are slightly more females (51,5%) than males (48,5%).
Population 	 The majority of the population consists of Black African followed by Whites.	 The majority of the population consists of Black African followed by Whites.	 The majority of the population consists of Black African followed by Whites.

SECONDARY ZONE			
Demographic Aspect	North West Province	Dr Kenneth Kaunda District Municipality	City of Matlosana
Language 	 The majority of the population in the province speak Setswana (above 2 000 000).	 The majority of the population in the district speak Setswana (above 300 00), followed by Afrikaans and Sesotho (both above 100 000), then isiXhosa (below 100 000).	 The majority of the population in the district speak Setswana (above 140 00), followed by Sesotho (80 000), then Afrikaans (below 80 000) and isiXhosa (below 60 000).
Households 	 Majority of the population in the province live in formal dwelling.	 Majority of the population in the district live in formal dwelling.	 Majority of the population in live in formal dwelling.

SECONDARY ZONE			
Demographic Aspect	North West Province	Dr Kenneth Kaunda District Municipality	City of Matlosana
Household Ownership	 44% of the total population of the province have owned and fully paid off tenure status. While 23% have a rented status.	 44% of the total population of the district have owned and fully paid off tenure status. While 27% have a rented status.	 46% of the total population have owned and fully paid off tenure status. While 29% have a rented from private individuals.
Education Level 	 The population in the province have the highest education level at Grade 12.	 The population in the province have the highest education level at Grade 12.	 The population in the province have the highest education level at Grade 12.

SECONDARY ZONE			
Demographic Aspect	North West Province	Dr Kenneth Kaunda District Municipality	City of Matlosana
Employment 	 Majority of the people are not economically active (below 1 000 000), while employed (above 800 000) and unemployed (400 000).	 Most of the workforce in the district are employed (below 200 000) followed by the other not economically active (above 150 000) the unemployed (below 100 000).	 Most of the workforce in the municipality are employed (below 120 000) followed by the other not economically active (below 100 000) the unemployed (below 60 000).
	 The majority of the people are not applicable followed by people in the formal sector.	 The majority of the people are not applicable followed by people in the formal sector.	 The majority of the people are not applicable followed by people in the formal sector.

SECONDARY ZONE			
Demographic Aspect	North West Province	Dr Kenneth Kaunda District Municipality	City of Matlosana
Water 	 Regional/local water scheme are the main source of water supply in the province.	 Regional/local water scheme are the main source of water supply in the district.	 Regional/local authority water scheme are the main source of water supply.
Toilet Facilities 	 Out of all the residents of the province, the majority of them have flush toilets that are connected to the sewerage system (below 60%). Less than 40% have pit latrines toilets.	 Out of all the residents of the district, the majority of them have flush toilets that are connected to the sewerage system (above 90%). Below 10% have pit latrines toilets.	 Above 90% have flush toilets that are connected to the sewerage system.

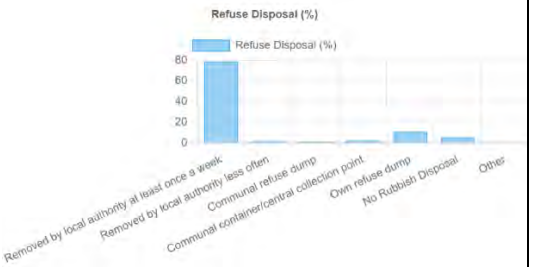
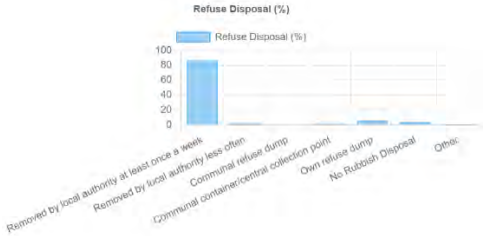
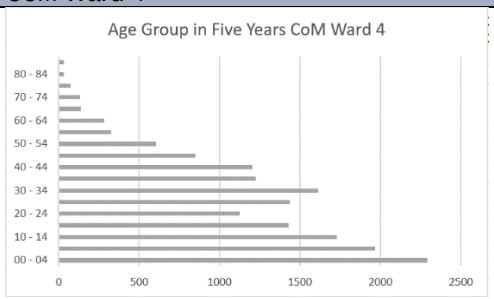
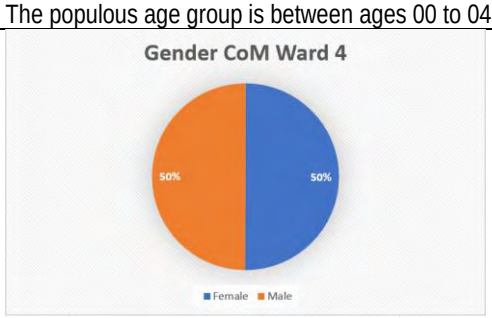
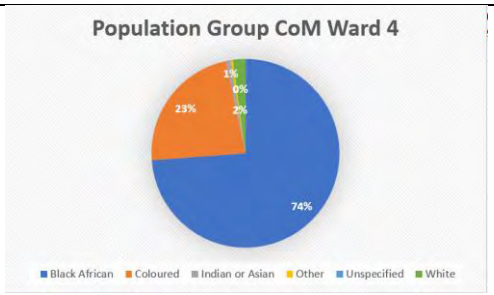
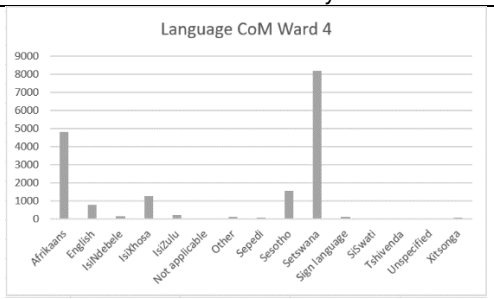
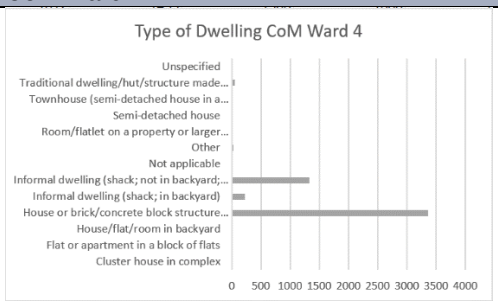
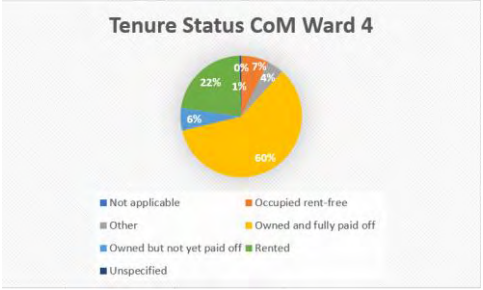
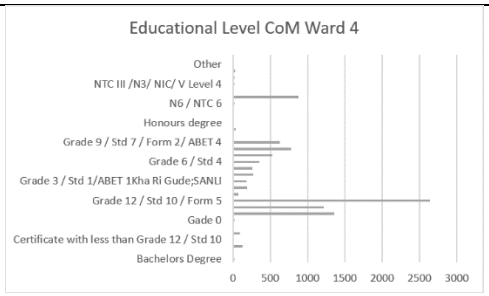
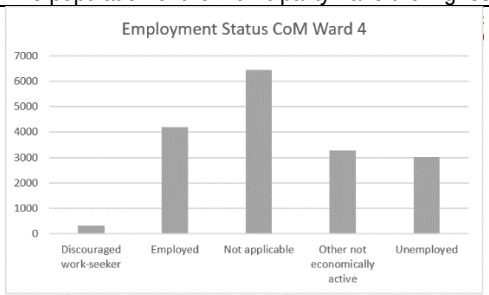
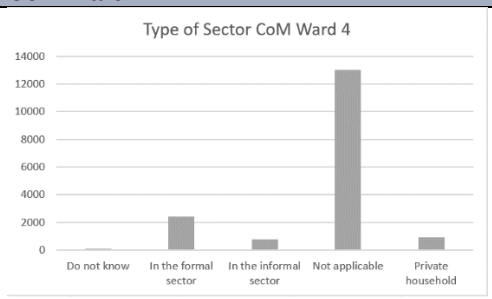
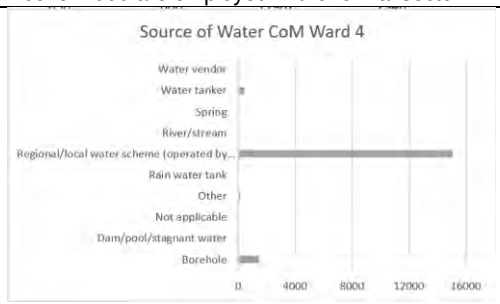
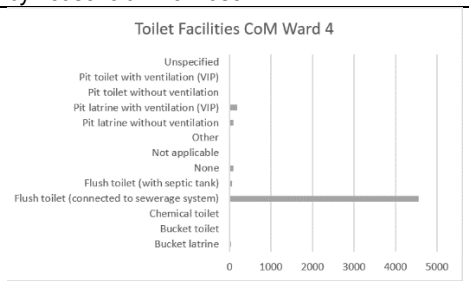
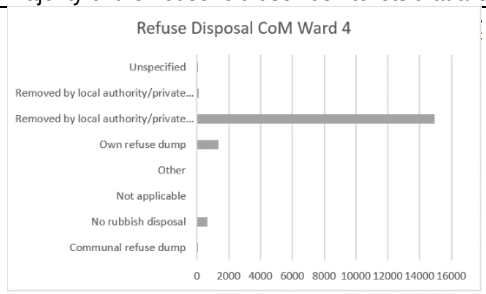
SECONDARY ZONE			
Demographic Aspect	North West Province	Dr Kenneth Kaunda District Municipality	City of Matlosana
Refuse Disposal/ Removal 	 Less than 60% households have their waste collected by the local authority at least once a week followed by households whom dispose their own refuse below 40%.	 80% households have their waste collected by the local authority at least once a week.	 Above 80% of the refuse that is generated by the community is collected by the local authority at least once a week.

Figure 8-10 Socio - Economic Baseline: Secondary Zones

Demographic Aspect	CoM Ward 4
Age 	 The populous age group is between ages 00 to 04. Followed Ages between 05 to 09.
Gender 	 There is 50% females and 50% males.
Population 	 74% are Black African followed by Coloured at 23%.
Language 	 The majority of the population speak Setswane (above 8 000), followed by Afrikaans (below 5 000), then Sesotho and isiXhosa (above 1 000).

Demographic Aspect	CoM Ward 4
Households 	 Majority of the population in live household made of bricks followed by informal dwelling.
Household Ownership	 60% of the total population have owned and fully paid off tenure status. While 22% have a rented tenure status.
Education Level 	 The population of the Municipality have the highest education level is Grade 12.
Employment 	 Above 4 000 are employed. 3 000 are unemployed. Above 3 000 are not economically active.

Demographic Aspect	CoM Ward 4
Type of Sector	 Above 2 000 are employed in the formal sector.
Water 	 Majority of the household depend on local authority as the main source of water supply. Followed by household whom use.
Toilet Facilities 	 Majority of the household use flush toilets that are connected to the sewerage system.
Refuse Disposal/ Removal 	 Majority of the household have their waste removed by the local authority.

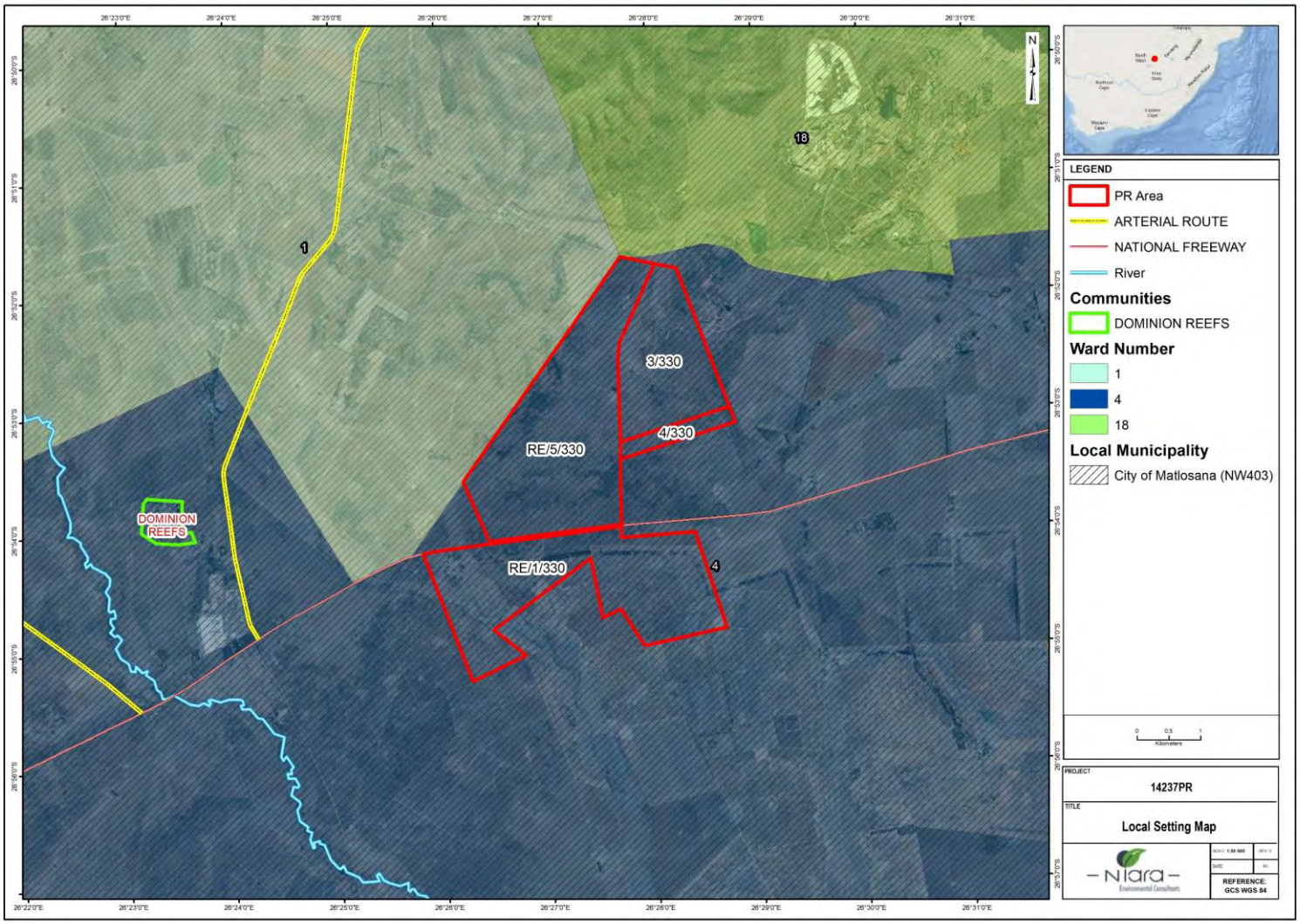


Figure 8-11: Locality Map with ward delineation

9 Impacts and Risks Identified including the Nature, Significance, Consequence, Extent, Duration and Probability

9.1 Identified Potential Impacts

Table 9-1 identified Potential impacts

Aspect	Activity	Significance	Mitigation Measures
Fauna and Flora	The removal of vegetation induced by prospecting activities will allow for an increase in surface water runoff, which may alter the topographical characteristics of the area;	Negligible </=20	Removal of vegetation must be undertaken in a phased approach to limit the number of exposed areas at a time;
	The land clearing essential for drilling sites and will alter the normal sequence of soil layers, altering the soil and land capabilities		Regular roads maintenance of eroded shoulders;
	The movement of heavy vehicles in the Prospecting area will result in compaction of soil, water runoff and soil erosion especially during the rainy season;		A clean-up of any accidental hydro-carbons spills on soil must be undertaken by trained personnel using commercially available emergency clean-up kits; Concurrent rehabilitation must be implemented to remedy the impacts;
	The equipment and vehicles may contaminate the soil due to accidental hydro-carbons spillages;		A clean-up of any accidental hydro-carbons spills on soil must be undertaken by trained personnel using commercially available emergency clean-up kits; Concurrent rehabilitation must be implemented to remedy the impacts;
	Loss of soil and land capability due to reduction in nutrient status because of de-nitrification and leaching due to stripping and stockpiling on the affected footprint.		Erosion control measures shall be implemented in instances where it is deemed necessary;

Aspect	Activity	Significance	Mitigation Measures
	Alteration of ecological life cycle due to site clearance and establishment of access roads		Site for temporary infrastructure establishment will be selected with the aim of minimising disturbance on the indigenous vegetation
	Employees and drilling contractors poaching and hunting animals;		Killing of animals on site will be strictly prohibited and if animal is found must be safely removed from the prospecting area
Environmental	Change in natural topography because of site establishment and pegging of a drilling site.		Stockpile the soils removed for rehabilitation; and Removal of vegetation must be undertaken in a phased approach to limit the number of plain areas at a time
Hydrological	Contamination of water resources and deterioration of water quality because of soil erosion from wind and water on the exposed surfaces. Consequently, the soil erosion may increase turbidity and sedimentation of nearby watercourses;	Negligible </=20	Implement soil pollution prevention methods. All construction activities must be undertaken outside of the 1 in 50-year flood line or 100 m from the edge of a watercourse;
	Potential deterioration in water quality due to the accidental spillages of hazardous substances;		All hydrocarbons must be stored on protected storage areas away from the watercourses and the riparian areas. All the accidental spillages must be remediated using commercially available emergency clean up kits; and Contractors may only use designated toilets and waste disposal facilities.
	Increased silt load in runoff as a result of site clearing, and grubbing of topsoil from the footprint area associated with drill sites and infrastructure; and Disturbance of free drainage and runoff.		Removal of vegetation must be undertaken in a phased approach to limit the number of exposed areas at a time; & Concurrent rehabilitation must be implemented to remedy the impacts;

Aspect	Activity	Significance	Mitigation Measures
Noise	Ambient noise levels increase during the construction phase because of movement of vehicles and machinery; and Disturbances to faunal species and the communities within the proximity of the site.	Negligible </=20	Maintain the vehicles and equipment. All engines should have silencers; Switching off equipment whilst it is not in use; Develop effective complaints register that can be maintained on a regular basis and is accessible to interested and affected parties, drilling activities must be restricted to the following hours: Monday to Friday – 07h00 to 17h00. Saturday – 07h00 to 14h00; and implement both environmental noise monitoring whenever activities are within 1km of receptors at night, or within 500m of receptors during the day, or if a noise-related complaint is received, and occupational noise monitoring.
Air Quality	High dust deposition can have a detrimental effect on the plants if leaves are smothered to the extent that transpiration and photosynthesis are impeded; Emissions of fine particulate matter carbon emissions and ambient air pollutants from diesel and petrol fumes from movement of vehicles and equipment could have adverse health effects on wildlife and people within the proximity of the project site.		Vehicle maintenance must be conducted regularly to avoid excessive diesel fumes; Dust suppression must be conducted should excessive dust be generated; Correct speed will be maintained at the proposed area site; and Implementation of concurrent rehabilitation activities to minimise the number and extent of exposed surfaces that would result in dust generation
Environmental	Visual intrusion as a result of machinery movement and the operation of vehicles and drill rig on site; Dust and View disturbance due to activities on site.		Ensure that all exposed surfaces are subjected to dust suppression where necessary; Clearing of vegetation must be undertaken within the demarcated boundaries of the designated area only; The number of vehicles and machinery to be used must be limited to a bare minimum.

Aspect	Activity	Significance	Mitigation Measures
Social	Transfer of skills and training to local people; Creation of temporary employment Opportunities to local people; The effect of this prospecting activities on employment and socio-economic regime will be positive, but very limited in extent and duration.	Negligible </=20	Skills development and transfer; Maximise procurement of goods and services from local providers; Opportunities for indigenous employment and economic development; 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 must be collected in designated areas prior to removal from site for recycling
Heritage	There are no known heritage resources on the site as per Department of Forestry and Fisheries and the Environment (DFFE) Web- based Environmental Screening Tool.		If any heritage resources, including fossils, graves, or human remains, are encountered, activity in the vicinity of the find must stop and these must be reported to the relevant authorities.
Environmental	Waste Generation including general, scrap and hazardous waste; and 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; Waste shall not be buried or burned on site; and No dumping shall be allowed in or near the site
Community Health	The particulate matters associated with dust generation during vehicle movement and drilling activities can cause respiratory diseases to the people in the proximity of the project area.		All areas that are sources of dust must be subjected to dust suppression; All employees will be issued with and instructed to wear the appropriated personal protective equipment (PPE).
Environmental	Theft of equipment and the damage of infrastructure;		All personnel that have access to the property will be provided with access cards; To prevent unauthorised access and potential health and safety issues, all project infrastructure should be confined within a fenced, protected area

Aspect	Activity	Significance	Mitigation Measures
	The influx of job seekers in the area may result in an increase in petty crimes;		Work with the local police department to establish standard operating procedures for the management and/or removal of loiterers;
	Inadequate communication channels may lead to community strife		Recruitment processes will not be undertaken on site;
	Increase in traffic volumes on existing traffic network because of pre-construction activities; and Cumulative impact on the condition of farm roads around the prospecting area		Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads; Remedy through emergency response procedures. Sections of existing road surfaces which have been impacted on by vehicular movement must be maintained and fixed by the Holder; and Existing Road surfaces must be utilised and maintained within baseline levels.

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

The impact significance rating process serves two purposes: firstly, it helps to highlight the critical impacts requiring the methodology used to evaluate and quantify the potential environmental impacts of the proposed Projects has been presented below.

Table 9-2: Impact Rating Methodology

Magnitude		Quantitative Score
The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it has a significant, moderate or insignificant		
(VL) Very Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected.	1
(L) Low	The impact alters the affected environment in such a way that the natural processes or functions are not affected significantly.	2
(M) Medium	The affected environment is altered, but functions and processes continue, albeit in a modified way.	3
(H) High	Function or process of the affected environment is disturbed to the extent where it temporarily ceases.	4
(VH) Very High	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.	5
Extent		
Classification of the physical and spatial aspect of the impact		
(F) Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.	1
(S) Site	The impact could affect the whole, or a significant portion of the site.	2
(R) Regional	The impact could affect the area including the neighbouring Farms, the transport routes and the adjoining towns.	3
(N) National	The impact could have an effect that expands throughout the country (South Africa).	4
(I) International	Where the impact has international ramifications that extend beyond the boundaries of South Africa.	5
Reversibility		
This describes the degree to which the impact can be managed following mitigation. The classes are rated as follows:		
Reversible	Can be avoided, managed or mitigated in such a way that natural processes are not affected and returned to natural state	1
Recoverable	Can be avoided, managed or mitigated to the degree that functions and processes continue in a modified way)	3
Irreversible	Irreversible impact (may cause irreplaceable loss of resources). Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.	5
Duration		
The lifetime of the impact, that is measure in relation to the lifetime of the proposed development.		
(S) Short Term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase.	1
(SM) Short - Medium Term	The impact will be relevant through to the end of a construction phase.	2
(M) Medium	The impact will last up to the end of the development phases, where after it will be entirely negated.	3
(L) Long Term	The impact will continue or last for the entire operational lifetime (i.e. exceed 20years) of the development, but will be mitigated by direct human action or by natural processes thereafter.	4
(P) Permanent	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact is transient.	5
Probability		

Magnitude		Quantitative Score
This describes the likelihood of the impact actually occurring. The impact may occur for any length of time during the life cycle of the activity. The classes are rated as follows:		
(I) Improbable	The possibility of the Impact occurring is none, due to the circumstances or design. The chance of this Impact occurring is zero (0%)	1
(P) Possible	The possibility of the Impact occurring is very low, due either to the circumstances or design. The chance of this Impact occurring is defined as 25% or less	2
(L) Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of Impact occurring is defined as 50%	3
(H) Highly Likely	It is most likely that the Impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75 %.	4
(D) Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100 %.	5
Weighting Factor		
Subjective score assigned by Impact Assessor to give the relative importance of a particular environmental component based on project knowledge and previous experience. Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance		
(L) Low		1
(LM) Low - Medium		2
(M) Medium		3
(MH) Medium - High		4
(H) High		5
Mitigation Measures and Mitigation Efficiency		
Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures		
Mitigation measures were recommended to enhance benefits and minimise negative impacts and address the following:		
Mitigation objectives: what level of mitigation must be aimed at: For each identified impact, the specialist must provide mitigation objectives (tolerance limits) which would result in measurable reduction in impact. Where limited knowledge or expertise exists on such tolerance limits, the specialist must make "educated guesses" based on professional experience;		
Recommended mitigation measures: For each impact the specialist must recommend practicable mitigation actions that can measurably affect the significance rating. The specialist must also identify management actions, which could enhance the condition of the environment. Where no mitigation is considered feasible, this must be stated and reasons provided;		
Effectiveness of mitigation measures: The specialist must provide quantifiable standards (performance criteria) for reviewing or tracking the effectiveness of the proposed mitigation actions, where possible; and		
Recommended monitoring and evaluation programme: The specialist is required to recommend an appropriate monitoring and review programme, which can track the efficacy of the mitigation objectives. Each environmental impact is to be assessed before and after mitigation measures have been implemented.		
The management objectives, design standards, etc., which, if achieved, can eliminate, minimise or enhance potential impacts or benefits. National standards or criteria are examples, which can be stated as mitigation objectives.		
Negligible	The impact will be mitigated to the point where it is of limited importance	</=20
Low	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels	</=40
Moderate	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw	</=60
High	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is	>60

Magnitude		Quantitative Score
	regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.	

9.2.1 Impact Assessment

A recapitulation of the Impact Rating Methodology has been provided in the table below:

Table 9-3: Recapitulation of Impact Rating Matric

Magnitude	Weight
Very Low	1
Low	2
Medium	3
High	4
Very High	5

Extent	Weight
Footprint	1
Site	2
Regional	3
National	4
International	5

Reversibility	Weight
Reversible	1
Recoverable	3
Irreversible	5

Duration	Weight
Short term	1
Short-Medium term	2
Medium term	3
Long term	4
Permanent	5

Probability	Weight
Improbable	1
Possible	2
Likely	3
Highly Likely	4
Definite	5

Significance	Weight
Negligible	</=20
Low	</=40
Moderate	</=60
High	>60

Table 9-4 - Impact Assessment - drilling Phase

				Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Phase	Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M +	E +	R +	D +	P +	S +	Post-Rating
Construction Phase	Fauna and Flora	The removal of vegetation induced by prospecting activities will allow for an increase in surface water runoff, which may alter the topographical characteristics of the area;	Negative	2	1	1	2	3	18	negligible 18(-)	Removal of vegetation must be undertaken in a phased approach to limit the number of exposed areas at a time;	1	1	1	2	2	10	negligible 10 (-)
Construction Phase	Fauna and Flora	The land clearing associated with prospecting activities will alter the normal sequence of soil layers, altering the soil and land capabilities	Negative	2	1	1	2	3	18	negligible 18(-)	Regular roads maintenance of eroded shoulders;	1	1	1	2	2	10	negligible 10 (-)
Construction Phase	Fauna and Flora	The movement of vehicles in the Prospecting area will result in compaction of soil, water runoff and soil erosion especially during the rainy season;	Negative	2	1	1	2	3	18	negligible 18(-)	A clean-up of any accidental hydro-carbons spills on soil must be undertaken by trained personnel using commercially available emergency clean-up kits; Concurrent rehabilitation must be implemented to remedy the impacts;	1	1	1	2	2	10	negligible 10 (-)

				Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Phase	Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M +	E +	R +	D +	P +	S +	Post-Rating
Construction Phase	Fauna and Flora	The equipment and vehicles may contaminate the soil due to accidental hydro-carbons spillages; and	Negative	2	1	1	2	3	18	negligible 18(-)	A clean-up of any accidental hydro-carbons spills on soil must be undertaken by trained personnel using commercially available emergency clean-up kits; Concurrent rehabilitation must be implemented to remedy the impacts;	1	1	1	2	2	10	negligible 10 (-)
Construction Phase	Fauna and Flora	Loss of soil and land capability due to reduction in nutrient status because of de-nitrification and leaching due to stripping and stockpiling on the affected footprint.	Negative	2	1	1	2	3	18	negligible 18(-)	Erosion control measures shall be implemented in instances where it is deemed necessary;	1	1	1	2	2	10	negligible 10 (-)
Construction Phase	Fauna and Flora	Alteration of ecological life cycle due to site clearance and establishment of access roads	Negative	2	1	1	2	3	18	negligible 18(-)	Site for temporary infrastructure establishment will be selected with the aim of minimising disturbance on the indigenous vegetation	1	1	1	2	2	10	negligible 10 (-)

				Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Phase	Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M +	E +	R +	D +	P +	S +	Post-Rating
Construction Phase	Fauna and Flora	Employees and drilling contractors poaching and hunting animals;	Negative	2	1	1	2	3	18	negligible 18(-)	Killing of animals on site will be strictly prohibited and if animal is found must be safely removed from the prospecting area	1	1	1	2	2	10	negligible 10 (-)
Construction Phase	Environmental	Change in natural topography because of site establishment and pegging of a drilling site.	Negative	2	2	1	2	3	21	low 21(-)	Stockpile the soils removed for rehabilitation; and Removal of vegetation must be undertaken in a phased approach to limit the number of plain areas at a time	1	1	1	2	2	10	negligible 10 (-)
Construction Phase	Hydrological	Contamination of water resources and deterioration of water quality because of soil erosion from wind and water on the exposed surfaces. Consequently, the soil erosion may increase turbidity and sedimentation of the nearby watercourse;	Negative	2	1	1	2	2	12	negligible (-12)	Implement soil pollution prevention methods. All construction activities must be undertaken outside of the 1 in 50-year flood line or 100 m from the edge of a watercourse;	1	1	1	2	2	10	negligible 10 (-)

				Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Phase	Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M +	E +	R +	D +	P +	S +	Post-Rating
Construction Phase	Hydrological	Potential deterioration in water quality due to the accidental spillages of hazardous substances;	Negative	2	1	1	2	2	12	negligible (-12)	All hydrocarbons must be stored on protected storage areas away from the watercourses and the riparian areas. All the accidental spillages must be remediated using commercially available emergency clean up kits; and Contractors may only use designated toilets and waste disposal facilities.	1	1	1	2	2	10	negligible 10 (-)
Construction Phase	Hydrological	Increased silt load in runoff as a result of site clearing, and grubbing of topsoil from the footprint area associated with drill sites and infrastructure; and Disturbance of free drainage and runoff.	Negative	2	1	1	2	2	12	negligible (-12)	Removal of vegetation must be undertaken in a phased approach to limit the number of exposed areas at a time; & Concurrent rehabilitation must be implemented to remedy the impacts;	1	1	1	2	2	10	negligible 10 (-)

				Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Phase	Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M +	E +	R +	D +	P +	S +	Post-Rating
Construction Phase	Noise	Ambient noise levels increase because of movement of vehicles and machinery; and Disturbances to faunal species and the communities within the proximity of the site.	Negative	2	2	1	1	3	18	negligible (-18)	Maintain the vehicles and equipment. All engines should have silencers;Switching off equipment whilst it is not in use; Develop effective complaints register that can be maintained on a regular basis and is accessible to interested and affected parties;drilling activities must be restricted to the following hours:Monday to Friday – 07h00 to 17h00. Saturday – 07h00 to 14h00	1	2	1	1	2	10	negligible 10 (-)

				Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Phase	Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M +	E +	R +	D +	P +	S +	Post-Rating
Construction Phase	Air Quality	gravel roads for the delivery of required material for infrastructure development; High dust deposition can have a detrimental effect on the plants if leaves are smothered to the extent that transpiration and photosynthesis are impeded; Emissions of fine particulate matter will have adverse health effects on wildlife and people within the proximity of the project site; and Generation of carbon emissions and ambient air pollutants from diesel and petrol fumes because of movement of vehicles and operation of machinery/equipment	Negative	2	2	1	1	3	18	negligible (-18)	Vehicle maintenance must be conducted regularly to avoid excessive diesel fumes;Conduct dust fall-out monitoring;Dust suppression must be conducted during the construction phase of the project should excessive dust be generated;Correct speed will be maintained at the proposed area site; and Implementation of concurrent rehabilitation activities to minimise the number of exposed surfaces that would result in dust generation	1	2	1	1	2	10	negligible 10 (-)

				Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Phase	Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M +	E +	R +	D +	P +	S +	Post-Rating
Construction Phase	Environmental	Visual intrusion as a result of machinery movement and the installation of the required infrastructure;Dust generated during site establishment; and View disturbance due to the placement of the equipment and offices used on site.	Negative	2	2	1	1	3	18	negligible (-18)	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; The number of construction vehicles and machinery to be used must be limited to a bare minimum.	1	2	1	1	2	10	negligible 10 (-)
Construction Phase	Social	Transfer of skills and training to local people; Creation of temporary employment Opportunities to local people; and The effect of this prospecting activities on employment and socio-economic regime will be positive, but very limited in extent and duration.	Positive	2	2	1	2	2	14	negligible (+14)	Skills development and transfer;Maximise procurement of goods and services from local providers;Opportunities for indigenous employment and economic development; Requirement for short-term	3	2	1	2	2	16	negligible 10 (+)

				Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Phase	Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M +	E +	R +	D +	P +	S +	Post-Rating
											accommodation and thus benefiting the house rental and accommodation sector; Supporting local recycling center and local scrap metal merchant; and Metals such as steel and copper wire must be collected in designated areas prior to removal from site for recycling							
Construction Phase	Heritage	There are no known heritage resources on the site as per Department of Forestry and Fisheries and the Environment (DFFE) Web- based Environmental Screening Tool.	Negative	2	1	1	1	2	10	negligible (-10)	If any heritage resources, including fossils, graves, or human remains, are encountered during construction phase, these must be reported to the relevant authorities.	1	1	1	1	2	8	negligible 8(-)

				Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Phase	Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M +	E +	R +	D +	P +	S +	Post-Rating
Construction Phase	Environmental	Waste Generation including general, scrap and hazardous waste; and If this waste is not stored correctly, can lead to environmental pollution including soil and water resources.	Negative	2	1	1	1	2	10	negligible (-10)	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;Waste shall not be buried or burned on site; and No dumping shall be alnegligibleed in or near the construction site	1	1	1	1	2	8	negligible 8(-)
Construction Phase	Community Health	The particulate matters associated with dust generation can cause respiratory diseases to the people in the proximity of the project area.	Negative	2	2	1	1	2	12	negligible (-12)	All areas that are sources of dust must be subjected to dust suppression; All employees will be issued with and instructed to wear the appropriated personal protective equipment (PPE)	1	2	1	1	2	10	negligible 10 (-)

				Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Phase	Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M +	E +	R +	D +	P +	S +	Post-Rating
											during construction.							
	Environmental	Theft of equipment and the damage of infrastructure;	Negative	2	2	1	1	2	12	negligible (-12)	All personnel that have access to the property will be provided with access cards;To prevent unauthorised access and potential health and safety issues, all project infrastructure should be confined within a fenced, protected area	1	2	1	1	2	10	negligible 10 (-)
	Environmental	The influx of job seekers in the area may result in an increase in petty crimes;	Negative	2	2	1	1	2	12	negligible (-12)	Work with the local police department to establish standard operating procedures for the management and/or removal of loiterers;	1	2	1	1	2	10	negligible 10 (-)
	Environmental	Inadequate communication channels may lead to community strife	Negative	2	2	1	1	2	12	negligible (-12)	Recruitment processes will not	1	2	1	1	2	10	negligible 10 (-)

				Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Phase	Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M +	E +	R +	D +	P +	S +	Post-Rating
											be undertaken on site;							
	Environmental	ncrease in traffic volumes on existing traffic network because of pre-construction activities; and Cumulative impact on the condition of farm roads around the prospecting area	Negative	2	2	1	1	2	12	negligible (-12)	Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads; Remedy through emergency response procedures sections of existing road surfaces which have been impacted on by vehicular movement; and Existing road surfaces must be utilised and maintained within baseline levels.	1	2	1	1	2	10	negligible 10 (-)

Table 9-5 - Impact Assessment - Decommissioning Phase

			Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M+	E+	R+	D+	P+	S+	Post-Rating
Fauna and Flora	The removal of the campsite equipment and the rehabilitation of the drilling sites and associated access infrastructure will result in the destruction of vegetation cover and soils.	Negative	2	1	1	2	2	12	Negligible (-12)	Rehabilitation must begin as soon as possible during the decommissioning period, ideally during the growing season, to enable enough plant recruitment; and Ensure that newly planted plants receive adequate irrigation and fertilisation to allow for quick establishment.	1	1	1	2	2	10	Negligible 10(-)

			Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M+	E+	R+	D+	P+	S+	Post-Rating
Hydrological	Increased silt load in runoff because of prospecting site rehabilitation may cause a pollution on the nearby surface water resources; and Surface water pollution from the accidental hydrocarbon spillages during the decommissioning of infrastructure	Negative	2	2	1	2	2	14	Negligible (-14)	The mitigation measures for the drilling phase apply.	1	1	1	2	2	10	Negligible 10(-)
Noise	It is envisioned that noise will be generated during the removal of	Negative	1	2	1	2	2	12	Negligible (-12)	Maintain the vehicles and equipment. All	1	1	1	2	2	10	Negligible 10(-)

			Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M+	E+	R+	D+	P+	S+	Post-Rating
	equipment and rehabilitation of the site. This noise is not expected to exceed occupational noise limits									engines should have silencers;							
Air Quality	The rehabilitation of the prospecting site and the decommissioning of the temporary infrastructure will make use of heavy machinery and vehicles. This will result in the generation of dust by movement of	Negative	2	2	1	2	2	14	Negligible (-14)	Vehicle maintenance must be conducted regularly to avoid excessive diesel fumes; and Dust suppression must be conducted during the decommissioning phase of the area	1	1	1	2	2	10	Negligible 10(-)

			Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M+	E+	R+	D+	P+	S+	Post-Rating
	vehicles and due to blowing winds. Vehicles and machinery will also generate diesel or petrol fumes. The occurrence of dust and fine particulates from the vehicles exhaust is envisioned to be of a short term.									should excessive dust be generated.							
Environmental	Traffic impacts are expected to be the same as in drilling phase	Negative	2	2	1	2	2	14	Negligible (-14)	The mitigation measures for the drilling phase apply; and A detailed	1	1	1	2	2	10	Negligible 10(-)

			Pre-Mitigation (M+E+R+D)xP=S								Post-Mitigation (M+E+R+D)xP=S						
Aspect	Potential Impact Description	Nature	M	E	R	D	P	S	Pre-Rating	Mitigation Measures	M+	E+	R+	D+	P+	S+	Post-Rating
										rehabilitation plan must be followed							

9.3 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.

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

Table 9-6: Positive and negative impacts that the proposed activity

Aspect	Description
Positive	
Socio-economic	• Opportunities for temporary employment and local economic development; • Requirement for the supply of the goods and services from the local businesses; • 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.
Negative	
Soils and Land Capability	• Loss of soil and land capability due to reduction in nutrient status as a result of de-nitrification and leaching due to stripping and stockpiling within the prospecting footprint areas; and • Soil compaction and contamination due to the movements of vehicles and machinery
Flora and Fauna	• Loss of indigenous vegetation; • Alteration of the ecological life cycle; • Alien species invasion; • Loss of animal life; • Disturbance of natural habitat/ sensitivity; • Employees and drilling contractors poaching and hunting animals; and • Displacement of animal life due to the prospecting activities.
Surface water resources	• Contamination of water resources and deterioration of water quality as a result of soil erosion from wind and water on the exposed surfaces; and • Disturbance of free drainage and runoff.
Groundwater resources	• Groundwater contamination as a result of borehole drilling and leaching of infilling material.

Aspect	Description
Noise	• Disturbance to humans and animals because of increase in the levels of ambient noise; and • Noise nuisance will be created by the drilling, operating equipment, and vehicle movement.
Air Quality/Dust	• Fine particulate matter emissions and dust fallout because of vehicle movement on dust roads and during drilling operations.
Topography and Visual	• Visual disturbance to the people at the nearby farmsteads as a result of introduction of the drill rigs and towers that will be employed during the drilling operations. • Visual disturbance due to dust generated as a result of the vehicular movements
Social Nuisances	• People at the nearby farmsteads are likely to be impacted upon by noise and dust that emanate from the site; and • Negative impact due to land dissection for temporary infrastructure erection through clearing, restrictions on farmers' access to cultivated land, and influence on day-to-day farming activities.
Waste	• Waste generation including the domestic, scrap and hazardous waste.
Health and Safety	• Health impact due to dust inhalation, occupational injuries; and • Equipment theft and property vandalism
Traffic	• Increase in traffic volumes on existing traffic network; and • Cumulative impact on the condition of farm roads around the prospecting area

9.4 The Possible Mitigation Measures that Could Be Applied and the Level of Risk.

This is the Draft Basic Assessment Report and affected parties have not yet had a chance to comment on the report. The report will be updated with comments received from affected parties before being submitted to the DMRE for decision-making. Therefore, the following mitigation can be implemented for sections of the proposed properties falling within the important areas. The following environmental management/mitigation plans can be followed if requested:

- Drill site selection and access road development must be aimed at minimising disturbance to natural vegetation;
- The site selection should be overseen by environmental scientists.
- No-go areas are to be identified where habitats are considered to be sensitive.
- Environmental awareness training is to be given to all employees responsible for drilling
- In order to minimise the impact of drilling activities on surface water a 100-meter buffer was allocated for each stream, river and wetlands.
- The drilling sites themselves will be provided with safety netting, fencing and signage to ensure no person or animal can access these sites

- Workers and operators will not be housed on site. In addition, rehabilitation objectives will include ensuring that the site is safe.

The following potential mitigation measures and residual risks have been provided for each environmental aspect assessed. It should be noted that this report will be made available to I&APs for review and comment, and their comments and concerns will be addressed in the final report to be submitted to the DMRE for adjudication

Furthermore, it should be noted that the results of the public consultation will be used to update the proposed potential mitigation measures prior to the submission of the finalised BAR and EMPR to the DMRE for adjudication.

9.4.1 Soils, Water & Waste

- Existing tracks and roads must be used as far as is practicable to minimize the potential for soil erosion. In instances where access to drill sites is to be established, and if required, raised blade clearing will be undertaken with a view to maintain vegetation cover to limit soil erosion potential.
- Soil disturbances are to be limited as far as practicable to minimize the potential for soil erosion
- When establishing the drill pad, topsoil including the remaining vegetation, will be stripped and stockpiled up-slope of the pad. The stockpile will be shaped to divert stormwater around the drill pad to minimise soil erosion of the pad. Stockpiled topsoil will be used during rehabilitation activities
- Topsoil will be stockpiled to a maximum height of 1.5m with a side slope of not more than 1:3
- Oils and lubricant will be stored within secondary containment structures
- Mixing of concrete or cement should be done on an impermeable board.
- Topsoil should be handled only twice, when removing and during rehabilitation.
- The movement of the vehicles should be restricted to minimise soil compaction. In the morning all the equipment and materials to be exported should be delivered at once
- If vehicle maintenance is undertaken on site, drip trays and / or UPVC sheets will be used to prevent spills and leaks into the soil
- Waste separation will be undertaken at source and separate receptacles will be provided (i.e., general wastes, recyclables and hazardous wastes).
- Receptacles will be closed (i.e., fitted with a lockable lid) to eliminate the possibility of access by animals overnight
- Wastes will be removed and disposed of at an appropriately licensed landfill and recyclables will be taken to a licensed recycling facility

- Drill holes must be permanently capped as soon as is practicable

9.4.2 Heritage

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

9.4.3 Influx of Labour to site

- If deemed necessary the South African Police Service will be informed of unauthorised persons encountered on site.

9.4.4 Social

- Casual labour will not be recruited at the site to eliminate the incentive for persons travelling to site seeking employment.

9.4.5 Noise

- The Drilling activities and movement of vehicles into the site should be carried out during the day. The working hours should be between 7:00 a.m. to 17:00
- Directly affected, adjacent landowners in proximity to the site will be informed of the planned activities.
- Wet dust suppression will be undertaken to manage dust emissions from vehicle movement and other activities as and when needed.
- The portable ablution facilities, water tanks and any other infrastructure should be acquired with consideration for colour, natural earth, green and mat black options which will blend in with the surrounding area must be favoured
- Waste management system will be implemented and sufficient waste bins will be provided for on-site

9.5 Motivation where No Alternatives Sites were considered

The application has been purposefully developed for the preferred site due to the nature of resource management in Southern Africa. The site further lends itself towards this development for the reason that the site is outside of the urban buildup areas. The current regional land use is farming and mining and this further have synergy with prospecting considering that the prospecting activities could be concluded without disrupting the day-to-day operation of the farmer.

No Alternative drill site locations were considered during the study. This is mainly due to the no-go options assessed in this document and the layout of the proposed mineral resource to be prospected for.

9.6 Statement motivating the Alternative Development Location within the Overall Site

No Alternative drill site locations were considered during the study. This is mainly due to the no-go options assessed in this document and the layout of the proposed mineral resource to be prospected for.

10 Full Description of the Process undertaken to Identify, Assess and Rank the Impacts and Risks the Activity will impose on the Preferred Site through the Life of the Activity

A comprehensive desktop investigation was conducted to assess the environmental context of the project site. This investigation utilized a range of resources to evaluate the significance and sensitivity of various environmental factors. The process involved analysing:

- Geographic Information System base maps
- The Department of Environmental Affairs Screening Tool

The impacts identified were rated quantitatively using Impact Ratings to assess their significance. This approach calculates the significance of each impact, while the Environmental Assessment Practitioner (EAP) evaluates whether these calculations align with both perceived and actual views. Management measures are then determined based on the impact's significance, focusing on options that are deemed both practical and economically viable, and have been considered successful in similar contexts.

11 Assessment of each Identified Potentially Significant Impact and Risk

Table 11-1: Identified Impacts

Aspect	Activity	Significance	Mitigation Measures
Fauna and Flora	The removal of vegetation induced by prospecting activities will allow for an increase in surface water runoff, which may alter the topographical characteristics of the area;	Negligible </=20	Removal of vegetation must be undertaken in a phased approach to limit the number of exposed areas at a time;
	The land clearing essential for infrastructure development will alter the normal sequence of soil layers, altering the soil and land capabilities		Regular roads maintenance of eroded shoulders;
	The movement of heavy vehicles in the construction area will result in compaction of soil, water runoff and soil erosion especially during the rainy season;		A clean-up of any accidental hydro-carbons spills on soil must be undertaken by trained personnel using commercially available emergency clean-up kits; Concurrent rehabilitation must be implemented to remedy the impacts;
	The equipment and vehicles may contaminate the soil due to accidental hydro-carbons spillages; and		A clean-up of any accidental hydro-carbons spills on soil must be undertaken by trained personnel using commercially available emergency clean-up kits; Concurrent rehabilitation must be implemented to remedy the impacts;
	Loss of soil and land capability due to reduction in nutrient status because of de-nitrification and leaching due to stripping and stockpiling on the construction footprint.		Erosion control measures shall be implemented in instances where it is deemed necessary;
	Alteration of ecological life cycle due to site clearance and establishment of access roads		Site for temporary infrastructure establishment will be selected with the aim of minimising disturbance on the indigenous vegetation
	Employees and drilling contractors poaching and hunting animals;		Killing of animals on site will be strictly prohibited and if animal is found must be safely removed from the prospecting area
Environmental	Change in natural topography because of site establishment and pegging of a drilling site.		Stockpile the soils removed for rehabilitation; and Removal of vegetation must be undertaken in a phased approach to limit the number of plain areas at a time
Hydrological	Contamination of water resources and deterioration of water quality because of soil erosion from wind and water on the exposed surfaces. Consequently, the soil erosion may increase turbidity and sedimentation of the nearby watercourse;	Negligible </=20	Implement soil pollution prevention methods. All construction activities must be undertaken outside of the 1 in 50-year flood line or 100 m from the edge of a watercourse;

Aspect	Activity	Significance	Mitigation Measures
	Potential deterioration in water quality due to the accidental spillages of hazardous substances;		All hydrocarbons must be stored on protected storage areas away from the watercourses and the riparian areas. All the accidental spillages must be remediated using commercially available emergency clean up kits; and Contractors may only use designated toilets and waste disposal facilities.
	Increased silt load in runoff as a result of site clearing, and grubbing of topsoil from the footprint area associated with drill sites and infrastructure; and Disturbance of free drainage and runoff.		Removal of vegetation must be undertaken in a phased approach to limit the number of exposed areas at a time; & Concurrent rehabilitation must be implemented to remedy the impacts;
Noise	Ambient noise levels increase during the construction phase because of movement of vehicles and machinery; and Disturbances to faunal species and the communities within the proximity of the site.	Negligible </=20	Maintain the vehicles and equipment. All engines should have silencers; Switching off equipment whilst it is not in use; Develop effective complaints register that can be maintained on a regular basis and is accessible to interested and affected parties; Construction activities must be restricted to the following hours: Monday to Friday – 07h00 to 17h00. Saturday – 07h00 to 14h00; and implement both environmental noise monitoring and occupational noise monitoring.
Air Quality	gravel roads for the delivery of required material for infrastructure development; High dust deposition can have a detrimental effect on the plants if leaves are smothered to the extent that transpiration and photosynthesis are impeded; Emissions of fine particulate matter during the construction stage will have adverse health effects on wildlife and people within the proximity of the project site; and Generation of carbon emissions and ambient air pollutants from diesel and petrol fumes because of movement of vehicles and operation of machinery/equipment		Vehicle maintenance must be conducted regularly to avoid excessive diesel fumes; Conduct dust fall-out monitoring; Dust suppression must be conducted during the construction phase of the project should excessive dust be generated; Correct speed will be maintained at the proposed area site; and Implementation of concurrent rehabilitation activities to minimise the number of exposed surfaces that would result in dust generation
Environmental	Visual intrusion as a result of machinery movement and the installation of the required infrastructure; Dust generated during site establishment; and View disturbance due to the placement of the equipment and offices used on site.		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; The number of construction vehicles and machinery to be used must be limited to a bare minimum.

Aspect	Activity	Significance	Mitigation Measures
Social	Transfer of skills and training to local people; Creation of temporary employment Opportunities to local people; and the effect of this prospecting activities on employment and socio-economic regime will be positive, but very limited in extent and duration.		Skills development and transfer; Maximise procurement of goods and services from local providers; Opportunities for indigenous employment and economic development; 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 must be collected in designated areas prior to removal from site for recycling
Heritage	There are no known important heritage resources on the site as per Department of Forestry and Fisheries and the Environment (DFFE) Web-based Environmental Screening Tool.	Negligible </=20	If any heritage resources, including fossils, graves, or human remains, are encountered during construction phase, these must be reported to the relevant authorities.
Environmental	Waste Generation including general, scrap and hazardous waste; and 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; Waste shall not be buried or burned on site; and No dumping shall be allowed in or near the construction site
Community Health	The particulate matters associated with dust generation during construction activities can cause respiratory diseases to the people in the proximity of the project area.		All areas that are sources of dust must be subjected to dust suppression; Continuous dust monitoring should be carried out throughout the construction undertakings; All employees will be issued with and instructed to wear the appropriated personal protective equipment (PPE) during construction.
Environmental	Theft of equipment and the damage of infrastructure;		All personnel that have access to the property will be provided with access cards; To prevent unauthorised access and potential health and safety issues, all project infrastructure should be confined within a fenced, protected area
	The influx of job seekers in the area may result in an increase in petty crimes;		Work with the local police department to establish standard operating procedures for the management and/or removal of loiterers;
	Inadequate communication channels may lead to community strife		Recruitment processes will not be undertaken on site;

Aspect	Activity	Significance	Mitigation Measures
	Increase in traffic volumes on existing traffic network because of pre-construction activities; and Cumulative impact on the condition of farm roads around the prospecting area		Local speed limits and traffic laws shall apply at all times to minimise the occurrences of accidents on public roads; Remedy through emergency response procedures sections of existing road surfaces which have been impacted on by vehicular movement; and Existing Road surfaces must be utilised and maintained within baseline levels.

12 Summary of Specialist Report

Table 12-1: Specialist Recommendations

List of Studies Undertaken	Recommendations of Specialist Report	Specialist Recommendations that have been included in the EIA Report	Reference to Applicable Sections of Report where Specialist Recommendations have been included
No studies have been undertaken for this application	N/A	N/A	N/A

A Screening Report for an Environmental Authorisation was generated from the Department of Environment, Forestry and Fisheries (DFFE) Web-based Environmental Screening Tool in terms of NEMA: EIA Regulations 2014 as amended. The following is a summary of the environmental sensitivities of the site where the proposed prospecting activities are to be undertaken. The Screening Tool enables the generating of a Screening Report referred to in Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014 (as amended) whereby a Screening Report is required to accompany any application for Environmental Authorisation and as such the tool has been developed in a manner that is user friendly and no specific software or specialised GIS skills are required to operate this system (DFFE, 2021). Consequently, the drilling activities will be undertaken on an area where there are no sensitivities. Specialist Reports and Memos of exclusion will be submitted in the Final BAR.

Table 12-2:Environmental sensitivity of the proposed area

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			

As indicated in table 12-2, a low rating indicates that the impacts are unlikely to occur. A medium rating indicates that the impact is likely/almost likely to occur, and a high rating means that the impact is possible/almost certain. A very high rating indicates that the impact on the proposed environment is certain to occur. The screening tool indicates Aquatic Biodiversity and Terrestrial biodiversity theme are very high. Agriculture, animal species, palaeontology and plant species are high to medium respectively. Thus, leaving Archaeological and cultural heritage theme on low.

13 Environmental Impact Statement

13.1 Summary of the Key Findings

Most of the prospecting activities are non-invasive, hence they will have no environmental or social impact. The invasive activities entail the site establishment and the drilling boreholes. This will have a minimal environmental and social impact as the overall site establishment and the drilling sites will be confined to a specific area on a small footprint.

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

Table 13-1: Summary of the Environmental Impact Assessment

Impacts	Activity Phases	Significance	
		Pre – Mitigation	Post – Mitigation
Soils and Land Capability	Construction	Medium (-)	Low (-)
	Operational	Medium (-)	Low (-)
	Decommissioning	N/A	N/A
Flora and Fauna	Construction	Medium (-)	Low (-)
	Operational	Medium (-)	Low (-)
	Decommissioning	Low (-)	Low (-)
Surface and Groundwater Resources	Construction	Low (-)	Low (-)
	Operational	Medium (-)	Low (-)
	Decommissioning	Low (-)	Low (-)
Noise	Construction	Medium (-)	Low (-)
	Operational	Medium (-)	Low (-)
	Decommissioning	Medium (-)	Low (-)
Air Quality/Dust	Construction	Medium (-)	Low (-)
	Operational	Medium (-)	Low (-)
	Decommissioning	Medium (-)	Low (-)
Visual	Construction	Medium (-)	Low (-)
	Operational	Medium (-)	Low (-)
Socio – Economic	Construction	Low (+)	Medium (+)
	Operational	Low (+)	Medium (+)
	Construction	Low (-)	Low (-)
Cultural and Heritage Resources	Construction	Low (-)	Low (-)
	Operational	Low (-)	Low (-)
Waste	Construction	Medium (-)	Low (-)
	Operational	Low (-)	Low (-)
Health and Safety	Construction	Medium (-)	Low (-)
	Operational	Low (-)	Low (-)
Traffic	Construction	Medium (-)	Low (-)

	Operational	Low (-)	Low (-)
	Decommissioning	Low (-)	Low (-)

13.2 Final Site Map

A final map to be provided in the final BAR.

13.3 Summary of the Positive and Negative Impacts and Risks of the Proposed Activity and Identified Alternatives

Table 13-2 summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

Aspect	Description
Positive	
Socio-economic	• Opportunities for temporary employment and local economic development; • Requirement for the supply of the goods and services from the local businesses; • 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.
Negative	
Soils and Land Capability	• Loss of soil and land capability due to reduction in nutrient status as a result of de-nitrification and leaching due to stripping and stockpiling within the prospecting footprint areas; and • Soil compaction and contamination due to the movements of vehicles and machinery
Flora and Fauna	• Loss of indigenous vegetation; • Alteration of the ecological life cycle; • Alien species invasion; • Loss of animal life; • Disturbance of natural habitat/ sensitivity; • Employees and drilling contractors poaching and hunting animals; and • Displacement of animal life due to the prospecting activities.
Surface water resources	• Contamination of water resources and deterioration of water quality as a result of soil erosion from wind and water on the exposed surfaces ; and • Disturbance of free drainage and runoff.
Groundwater resources	• Groundwater contamination as a result of borehole drilling and leaching of infilling material.

Aspect	Description
Noise	• Disturbance to humans and animals because of increase in the levels of ambient noise; and • Noise nuisance will be created by the drilling, operating equipment, and vehicle movement.
Air Quality/Dust	• Fine particulate matter emissions and dust fallout because of vehicle movement on dust roads and during drilling operations.
Topography and Visual	• Visual disturbance to the people at the nearby farmsteads as a result of introduction of the drill rigs and towers that will be employed during the drilling operations. • Visual disturbance due to dust generated as a result of the vehicular movements
Social Nuisances	• People at the nearby farmsteads are likely to be impacted upon by noise and dust that emanate from the site; and • Negative impact due to land dissection for temporary infrastructure erection through clearing, restrictions on farmers' access to cultivated land, and influence on day-to-day farming activities.
Waste	• Waste generation including the domestic, scrap and hazardous waste.
Health and Safety	• Health impact due to dust inhalation, occupational injuries; and • Equipment theft and property vandalism
Traffic	• Increase in traffic volumes on existing traffic network; and • Cumulative impact on the condition of farm roads around the prospecting area

14 Proposed Impact Management Objectives and the Impact Management Outcomes for Inclusion in the EMPR

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 impacts can be managed and mitigated effectively.

- Heritage/cultural resources can be managed by avoidance of known resources and through 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 drilling 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 adhering to the mitigation measures on the biodiversity protection and conservation which are proposed in this report.
- 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 treat local residents with respect and courtesy at all times.

15 Final Proposed Alternatives

Table 15-1 Final Proposed alternatives

Aspect	Alternative	Reasoned Discussion
Properties included	No property alternative was considered due to the nature of the activity. The Diamond mining market is quite competitive and due to the process in which one applies for a right, the area is pre-determined to the application. This means that no alternative in terms of properties can be assessed	
Type of Activity	Prospecting – Core Drilling	Prospecting is conducted by means of core drilling. This is best suited for this environment and for the minerals to be prospected for due to the depth at which the resources might be found. The alternative would be trenching, or even bulk sampling. However, a small 5 ha bulk sample will not be indicative

Aspect	Alternative	Reasoned Discussion
		of the whole property and thus not be beneficial to this process of determining feasibility.
Layout Design	Site Layout	Various factors are taken into consideration when the layout was developed. Firstly, there is the no-go area, such as watercourses, wetlands, etc. Then you have infrastructure restrictions like houses, buildings, fences, roads, powerlines etc. Lastly, there is the physical characteristics of the property like the contours and slopes etc. The vegetation is also an important factor as the restriction would be to have a minimal and if possible, no impact on the natural vegetation.
Technology	Diamond Core Drilling	For the purpose of this project no alternatives were considered in terms of technology due to the nature of the prospecting to be conducted. Diamond Core Drilling was selected considering that there is a need to develop a resource and reserve model and there needs to be cores collected in order to analyse the quality for the same model.
No-Go	The no-go option considered included that no invasive drilling be conducted and only desktop analysis be done. This will not render the project to be successful as there would be no actual, proved data available and there would be no qualities available. This would render any form of feasibility to be unsuccessful as the quality and quantity of the resource is of utmost importance.	

16 Aspects for Inclusion as Conditions of Authorisation

In authorising the proposed Prospecting Activity, the following conditions should form part of the environmental authorisation:

- The activities undertaken should be in line with the listed notices applied for in the application, and deviations thereof will be treated as on the merits thereof.
- The Applicant (AGIM) must, where necessary, undertake specialists' studies, management procedures and method statement should the need arise
- The EMPr must be implemented fully at all stages of the proposed project

- Should archaeological sites or graves be exposed in other areas during the Project, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

17 Description of any Assumptions, Uncertainties and Knowledge Gaps

The EIA Regulations, 2014 outline specific requirements that a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures must be provided in the EIR.

The assessments undertaken are based on conservative methodologies and these methods attempts to determine potential negative impacts that could occur on the affected environmental aspects. These impacts may however be of smaller magnitude than predicted, while benefits could be of a larger extent than predicted.

The EIA has investigated the potential impact on key environmental media relating to the specific environmental setting for the site. A number of desktop assessment were undertaken and result thereof and are presented in this report.

The information provided in this BAR and EMPr is therefore considered sufficient for decision-making purposes.

18 Reasoned Opinion as to whether the Proposed Activity should or should not be authorised

18.1 Reasons why the activity should be authorised or not

Informed by the impact assessment conducted there is no evidence that the proposed activity in the proposed manner would detrimentally impact the environment. The nature of the activity applied for is primarily desktop/non-invasive based and therefore should be approved with the necessary conditions protecting the integrity of the natural resources.

18.2 Conditions that must be included in the authorisation

In taking the abovementioned information into consideration, it is noted that there are water resources (perennial and non-perennial) found on site. These resources need to be protected throughout this process and therefore it is proposed that a 100m buffer around all wetlands and watercourses be defined and depicted as a no-go-area. Care should be taken by the drilling team and site supervisor to ensure that no natural vegetation, as far as possible, is disturbed and or removed from site. The EMP must be implemented to its full extent and annual updates of the progress, performance assessments and ECO Reports must be submitted to the Department for record keeping and should any incidents, accidents or emergency situations arise, the Department must be notified immediately.

19 Period for which the Environmental Authorisation is required

The period for which the Authorisation is requested should be the 5-year period as per the Prospecting Right timeframe.

20 Undertaking

The undertaking required to meet the requirements of this section is provided in part B, Section 11 of this report and is applicable to both the Basic Assessment Report and the Environmental Management Programme report.

21 Financial Provision

NEMA, under Section 24 P, requires an applicant applying for an Environmental Authorisation related to mining and mining related activities to comply with the prescribed financial provision for the rehabilitation, closure and ongoing post closure management of adverse environmental impacts before the Minister responsible for Mineral Resources can issues this desired authorisation. The above-mentioned financial provision may be in the form of an, bank guarantee, insurance, trust fund or cash deposit.

Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (GNR 1147) were promulgated on the 20th of November 2015. AGIM has undertaken the financial provision determination in line with the requirements of Section 11 of the Regulations dealing with Financial Provision for Prospecting, Exploration, Mining or Production Operations (GNR 1147).

21.1 Determination of the amount of Financial Provision

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

Prospecting activities are to be undertaken in a manner which facilitates site rehabilitation and the restoration of existing land capabilities. The primary objectives for rehabilitation include:

- The facilitation of the re-establishment of the land use and capability to as close as reasonable to the original conditions.
- Removal of all infrastructure and material introduced to site,
- Removal of all wastes
- Promotion of the re-establishment of the natural vegetation and the restoration of the site ecology. The disturbed areas shall be rehabilitated to ensure that:
    - The biodiversity habitat is encouraging the land use after the prospecting
    - Eliminate any safety risk associated with drill holes and sumps through adequate drill hole capping and backfilling.
    - Environment and resources are not subjected to physical and chemical deterioration,
    - The site is reversed to its original state
    - The after-use of the site will be in line with the current land use

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

The draft BAR and EMPR is made available to the interested and affected parties during the public participation process for the proposed area. Note that the consultation of interested and affected parties included the owners of the properties directly affected by the proposed area and owners of land immediately adjacent the proposed area. The above confirms that the land owners and interested and affected parties were consulted regarding the environmental objectives in relation to the closure of the proposed area.

21.1.3 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

In terms of Regulation 23 of NEMA EIA Regulations, 2014, an EMPR must address the requirements as determined in the regulations, pertaining to the financial provision for the rehabilitation, closure and post closure of the proposed operations. In view of the above, a rehabilitation plan must be provided to the DMRE in support of the financial provision determined for the proposed operations. Since no disturbance has resulted on site due to the proposed area no annual rehabilitation plan was compiled.

21.2 POST-CLOSURE MONITORING AND MAINTENANCE

Prior to decommissioning and rehabilitation activities, a monitoring programme shall be developed and submitted to the relevant authority for approval, as a part of the Final Rehabilitation Plan. The programme is to include proposed monitoring during and after the closure of each of the prospecting borehole sites and related activities. It is recommended that the post-closure monitoring include the following:

- Confirmation that any waste, wastewater or other pollutants that is generated because of decommissioning will be managed appropriately, as per the detailed requirements set out in the Final Rehabilitation Plan.
- Confirmation that all de-contaminated sites are free of residual pollution after decommissioning.
- Confirmation that acceptable cover has been achieved in areas where natural vegetation is being reestablished. 'Acceptable cover' means re-establishment of pioneer grass communities over the disturbed areas at a density similar to surrounding undisturbed areas non-eroding and free of invasive alien plants.
- Confirmation that the prospecting borehole sites are safe and are not resulting in a pollution hazard

Annual environmental reports will be submitted to the Designated Authority and other relevant Departments for at least one-year post-decommissioning. The frequency and duration of this reporting period may be increased to include longer term monitoring, at intervals to be agreed with the Designated Authority.

The monitoring reports shall include a list of any remedial action necessary to ensure that infrastructure that has not been removed remains safe and pollution free and that rehabilitation project sites are in a stable, weed and free condition.

21.3 Explain Why It Can Be Confirmed that the Rehabilitation Plan Is Compatible with the Closure Objectives

The closure plan will assist the proposed mining operation to achieve the following objectives:

- Comply with relevant legislation and policy requirements with regards to mine rehabilitation.
- Avoid or mitigate impacts associated with the project which may be detrimental to the environment.
- Land rehabilitation to a predetermined and agreed upon state that allows sustainable land use and capability of the site, that is to return the site to the condition that existed prior to mining or an agreed upon state.
- Cost effective and efficient closure of prospecting activities.
- Management and monitoring of the area post-closure.

The rehabilitation plan will thus be aligned to the closure objectives and tailored to the project to achieve these objectives. It will include information about the site prior to the mining operation and provide information on the maintenance of resources required for the rehabilitation process, as well detail how rehabilitation will be undertaken. It will also provide information on the management and monitoring of disturbance to avoid or minimise detrimental impacts, as well as an estimate of the financial closure provision. It will also include information associated with post-closure environmental monitoring of the site to ensure that the rehabilitation plan is followed and its objectives are achieved.

21.4 Calculate And State the Quantum of the Financial Provision Required to Manage and Rehabilitate the Environment in Accordance with the Applicable Guideline.

The financial pecuniary provision for the AGIM Project will be determined based on the requirements of "DMRE Guideline Document for The Evaluation of The Quantum of Closure-Related Financial Provision Provided by a Mine" (DMRE, 2005)

21.4.1 Quantity Estimation

For the purposes of this assessment, Niara can confirm that the method adopted to obtain and compile the schedule of quantities is sound, correct, and provides detail that is required by the DMRE. The information will allow for continued monitoring and updating of quantities and provides the ideal platform to manage and monitor the actual on- site rehabilitation measures and costs incurred.

21.4.2 Determination of Rates

The method of determining the applicable rehabilitation rates is based on practical experience and information by third party contractors.

The following table summarizes the unit rates for closure components as specified in the DMRE Guideline Document and indicates which rates were used by Niara in this assessment.

Table 21-1 Quantum calculation for prospecting activities

Component	*Description*	*CPI Adjusted Master Rate*	*Quantity*	*Unit*	*Multiplication Faction*	*Weighting Factor 1: Nature of Terrain*	*Sub Totals {E=a*b*c*d}*
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	R16,59	0	m3	1	1	R0,00
2 (A)	Demolition of steel buildings and structures	R231,09	0	m2	1	1	R0,00
2(B)	Demolition of reinforced concrete buildings and structures	R340,55	0	m2	1	1	R0,00
3	Rehabilitation of access roads	R41,35	0	m2	1	1	R0,00
4 (A)	Demolition and rehabilitation of electrified railway lines	R401,36	0	m	1	1	R0,00
4 (B)	Demolition and rehabilitation of non-electrified railway lines	R218,92	0	m	1	1	R0,00
5	Demolition of housing and/or administration facilities	R462,17	0	m2	1	1	R0,00
6	Opencast rehabilitation including final voids and ramps	R235 221,83	0	ha	1	1	R0,00
7	Sealing of shafts adits and inclines	R124,06	0	m3	1	1	R0,00
8 (A)	Rehabilitation of overburden and spoils	R161 517,37	0	ha	1	1	R0,00
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	R201 116,96	0	ha	1	1	R0,00
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	R584 284,21	0	ha	1	1	R0,00
9	Rehabilitation of subsided areas	R135 246,47	0	ha	1	1	R0,00
10	General surface rehabilitation	R25 000,00	0,94	ha	1	1	R23 500,00
11	River diversions	R127 949,00	0	ha	1	1	R0,00
12	Fencing	R145,95	0	m	1	1	R0,00
13	Water management	R48 649,81	0	ha	1	1	R0,00
14	2 to 3 years of maintenance and aftercare	R17 027,43	0,94	ha	1	1	R16 005,78
15	Specialist Studies	R0,00	0	Report	1	1	n/a
Sub Total (1 - 15 above)							*R39 505,78*

Component	*Description*	*CPI Adjusted Master Rate*	*Quantity*	*Unit*	*Multiplication Faction*	*Weighting Factor 1: Nature of Terrain*	*Sub Totals {E=a*b*c*d}*
Sub Total 1		Weighting Factor 2				1,05	R41 481,07
Preliminary & General		12% of Subtotal 1 if less than R100 million					R4 977,73
		6% of Sub Total 1 if more than R100 million					R0,00
Contingency		10% of Sub Total 1					R4 148,11
Sub Total 2 (Sub Total 1 + sum of Management and Contingency)							*R9 125,84*
Sub Total 3							*R50 606,91*

21.5 Confirm that this amount can be provided for from operating expenditure

Due to the nature of the activity, the provisioning is typically made before the Prospecting Right is executed and as such does not form part of the continuous operational budget. Africa Gulf International Mining will provide a Rehab Guarantee to the amount of R50 606.91 to DMRE when execution of the Prospecting Right is done.

22 Specific Information required by the Competent Authority

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), an EIA report must include consideration of socio-economic and cultural impacts. These aspects are discussed below.

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

The purpose of the DBAR consultation is to allow interested and affected persons to raise any concerns. A public participation process will be initiated to consult with I&APs including the landowners and surrounding communities. A public participation report will therein be incorporated in the final Basic Assessment Report (BAR).

23 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 investigations required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix 4).

No alternatives of the site were considered based on the following:

- The proposed prospecting area is targeted as historically, uranium and molybdenum seams occurrences are common in the area and this has been exploited for uranium and molybdenum in the past. There have also been various mining operations within the vicinity of the exploration area.
- There is sufficient open area with no settlements or any economic activities that could possibly create conflicts with the landowners.
- There are no historically or heritage resources known to be on site.

Section B: Environmental Management Programme Report

1 Details of the EAP

The requirement for the provision of the details and expertise of the EAP are included in PART A, section 1 (a).

2 Description of the Aspects of the Activity

The requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section 3

3 Composite Map

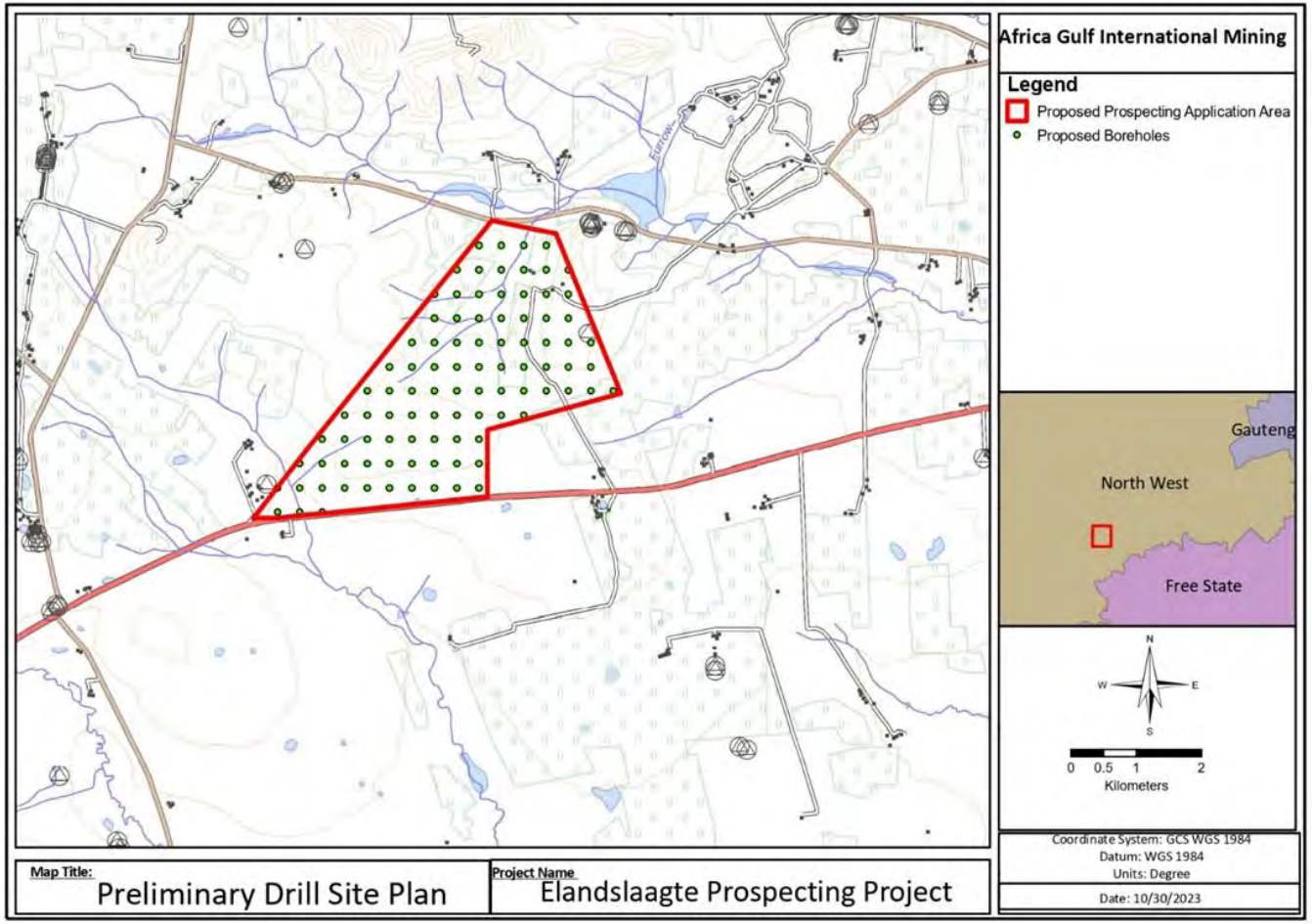


Figure 3-1 Composite map for 14237

4 Description of Impact Management Objectives including Management Statements

The following are the closure objectives, general principles and objectives guiding closure of the AGIM areas closure planning:

- Rehabilitation of areas disturbed as a consequence of prospecting to a land capability that will support and sustain a predetermined post-closure land use;
- Removal of all infrastructure/equipment that cannot be beneficially re-used, as per agreements established, and returning the associated disturbed land to the planned final land use;
- Removal of existing contaminated material from affected areas;
- Establishment and implementation of measures that meet specific closure related performance objectives;
- Monitoring and maintenance of rehabilitated areas forming part of site closure to ensure the long-term effectiveness and sustainability of measures implemented.

4.1 Determination of closure objectives

The main goal with closure would be to ensure that the landowners can continue with his/her land use which at this stage is grazing and dryland agriculture. No prospecting will be allowed on areas associated with Pivot Irrigation except with express permission from the landowner. The aim would therefore be to remove all infrastructure placed by the contractor and rehabilitate the areas impacted with indigenous vegetation and ensuring that no negative impacts are allowed to establish and encroach the area of focus.

The EMPR includes a monitoring and a rehabilitation plan. The plan shall outline the closure objectives which are aimed at reinstating the landform, land use and vegetation units to the same as before prospecting operations take place unless a specific, reasonable alternate land use is requested by the landowner. As such, the intended end use for the disturbed prospecting areas and the closure objectives will be defined in consultation with the relevant landowner. Proof of such consultation will be submitted together with the Application for Closure Certificate.

- The overall aim of the rehabilitation plan is to rehabilitate the environment to a condition as close as possible to that which existed prior to prospecting. This shall be achieved with several specific objectives.
- Making the area safe. I.e., decommission prospecting activities so as to ensure that the environment is safe for people and animals. This entails refilling excavations, sealing boreholes, etc.
- Recreating a free draining landform. This entails earthworks infilling, reshaping, levelling, etc. to recreate as close as possible the original topography and to ensure a free draining landscape.

- Re-vegetation. This involves either reseeding or allowing natural succession depending on the area, climate etc.
- Storm water management and erosion control. Management of storm water and prevention of erosion during rehabilitation. E.g., cut off drains, berms etc. and erosion control where required.
- Verification of rehabilitation success. Entails monitoring of rehabilitation.
- Successful closure. Obtain closure certificate

4.2 Volumes and rate of water use required for the operation

During prospecting, minimal water is used and any water utilized is usually recycled. As this project does not trigger a water use license, no abstraction is allowed from any watercourses.

4.3 Has a water use license been applied for?

No water use license has been applied for primarily due to the fact that no Section 21 water uses in terms of the national water act, 1998 (Act No 36 of 1998) have been triggered by this project.

5 Impacts to be mitigated in their respective phases

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

Table 5-1: Impacts to be mitigated in their respective phases

Activity	Phase	Size & Scale of Disturbance	Mitigation Measure	Compliance with Standards	Time Period for Implementation
Site Establishment	Construction, Operational & Rehabilitation	<1Ha	Ensure minimal disturbance of natural areas. Ensure that rehabilitation is done in such a manner that no alien invasive species are allowed to encroach the area of disturbance	Best practices for Rehabilitation and Soil Management	From the start of the activity to the end of the closure phase
Drill Sites	Construction, Operational & Rehabilitation	<1Ha	Select drill sites that are reachable without causing damage to the natural environment. Ensure that all drilling holes are capped off and natural seed mixes are used during the rehabilitation phase.	Best practices for Rehabilitation and Soil Management	From the initial drilling programme until the end of the closure phase
Equipment Storage	Construction, Operational & Rehabilitation	<1Ha	Store equipment and dangerous goods in such a manner that these don't cause any potential impact on the environment. Drip trays for parked vehicles and trucks, bunded storage containers for fuels, oils etc.	Dangerous good storing	From site establishment to closure and site handover
Access Roads	Construction, Operational & Rehabilitation	<1Ha	Ensure that existing infrastructure is used, where not, ensure minimal impact on the natural environment.	n/a	From site establishment to closure and site handover
Fencing & Security	Construction, Operational & Rehabilitation	<1Ha	Ensure that minimal impacts on the landowner's grazing activity is allowed to take place due to the erecting of fences	n/a	From site establishment to closure and site handover

5.1 Impact Management Outcomes

Table 5-2: Impact management outcomes and actions

Activities	Potential impacts	Aspects affected	Phase	Mitigation type	Standard to be achieved
Groundwater					
Site clearing	Groundwater depletion	Groundwater quantity	Construction	Control through measurement	Groundwater monitoring must commence from the start of the construction phase. - A sample should be collected from the existing borehole both before and after drilling, and the depth and quality of the samples should be compared

Activities	Potential impacts	Aspects affected	Phase	Mitigation type	Standard to be achieved
					Protection of the water table and groundwater quality should commence with the start of the construction phase
Drilling of boreholes	Groundwater and surface water depletion	Surface and groundwater quantity	Operation and post- closure	Control through measurement	Compensation to affected groundwater users should be provided by the Holder, if groundwater levels or quality is adversely affected by the drilling campaign. Groundwater quality must be determined through sampling and analysis prior to drilling commencing on site, and once drilling is complete, groundwater sampling and analysis should prove no adverse effects from drilling to groundwater quality or depth.
Air Quality					
Transport of construction material to the project site	Reduction in the quality of air due to dust generation and wind erosion	Air Quality	Construction	Control through measurement	South African National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013).
Storage of fuel, lubricants and explosives	Reduction in the quality of air due to the evaporation of volatiles		Construction	Control through measurement	National Environmental Management: Air Quality Act, Act.39 of 2004; Mine Health and Safety Act, 1996 (Act No. 29 of 1996)
Drilling	Reduction in the quality of air due to dust generation		Operation	Control through measurement	South African National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013).
Removal of drill core for analysis	Reduction in the quality of air due to dust generation from vehicle movement		Operation	Control through measurement	South African National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013).
Vehicle activity on access roads	Reduction in the quality of air due to dust generation		Operation	Control through measurement	South African National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013).
Establishment of the topsoil stockpiles	Reduction in the quality of air due to dust generation and wind erosion		Operational	Control through measurement	South African National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013).
Concurrent replacement of topsoil and the re-vegetation of drill site	Reduction in the quality of air due to dust generation and wind erosion		Operational	Control through measurement	South African National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013).

Activities	Potential impacts	Aspects affected	Phase	Mitigation type	Standard to be achieved
Demolition and removal of infrastructure	Reduction in the quality of air due to dust generation and wind erosion		Decommissioning	Control through measurement	South African National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013).
Final replacement of topsoil and the establishment of vegetation on the affected footprints	Reduction in the quality of air due to dust generation and wind erosion		Rehabilitation	Control through measurement	National Environmental Management: Air Quality Act, Act.39 of 2004; National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) - National Dust Control Regulations (2013); Mine Health and Safety Act, 1996 (Act No. 29 of 1996).

6 Financial Provision

The prospecting activities will require R50 606.91 (including VAT) for environmental rehabilitation. Financing will be sourced from the capital expenditure as planned by the company; this capital will come from the treasury of the company. As part of the PWP, the applicant has provided the financial competency of the company.

It should be noted that the current expenditure provided for in the PWP does not include the calculated Financial Provision as included in this Basic Assessment, as these values were estimated at the time of the submission of the PWP. The provision for closure should be included in the PWP prior the decision by the DMR should this decision be positive. The Financial Provision and Quantum Assessment have been thoroughly discussed in Section 19 of this document.

Component	Description	CPI Adjusted Master Rate	Quantity	Unit	Multiplication Faction	Weighting Factor 1: Nature of Terrain	Sub Totals {E=a*b*c*d}
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	R16,59	0	m3	1	1	R0,00
2 (A)	Demolition of steel buildings and structures	R231,09	0	m2	1	1	R0,00
2(B)	Demolition of reinforced concrete buildings and structures	R340,55	0	m2	1	1	R0,00
3	Rehabilitation of access roads	R41,35	0	m2	1	1	R0,00
4 (A)	Demolition and rehabilitation of electrified railway lines	R401,36	0	m	1	1	R0,00
4 (B)	Demolition and rehabilitation of non-electrified railway lines	R218,92	0	m	1	1	R0,00
5	Demolition of housing and/or administration facilities	R462,17	0	m2	1	1	R0,00
6	Opencast rehabilitation including final voids and ramps	R235 221,83	0	ha	1	1	R0,00
7	Sealing of shafts adits and inclines	R124,06	0	m3	1	1	R0,00
8 (A)	Rehabilitation of overburden and spoils	R161 517,37	0	ha	1	1	R0,00
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	R201 116,96	0	ha	1	1	R0,00
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	R584 284,21	0	ha	1	1	R0,00
9	Rehabilitation of subsided areas	R135 246,47	0	ha	1	1	R0,00
10	General surface rehabilitation	R25 000,00	0,94	ha	1	1	R23 500,00
11	River diversions	R127 949,00	0	ha	1	1	R0,00
12	Fencing	R145,95	0	m	1	1	R0,00
13	Water management	R48 649,81	0	ha	1	1	R0,00
14	2 to 3 years of maintenance and aftercare	R17 027,43	0,94	ha	1	1	R16 005,78
15	Specialist Studies	R0,00	0	Report	1	1	n/a
Sub Total (1 - 15 above)							***R39 505,78***
Sub Total 1		Weighting Factor 2				1,05	R41 481,07
Preliminary & General		12% of Subtotal 1 if less than R100 million					R4 977,73
		6% of Sub Total 1 if more than R100 million					R0,00
Contingency		10% of Sub Total 1					R4 148,11
Sub Total 2 (Sub Total 1 + sum of Management and Contingency)							***R9 125,84***
Sub Total 3							***R50 606,91***

7 Monitoring compliance with and performance assessment

Table 7-1: EMPR Compliance

Source activity	Impacts requiring monitoring programme	Functional requirements for monitoring	Roles and responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementation
• 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 • Groundwater quality deterioration; • Noise and dust generation; and • Visual and topography disturbance	• Document control; • Site Inspections and checklists; and • Report review and Development of actions plan	• 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
• 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	• Contractor • Environmental representatives	• Weekly inspections and checklists

Source activity	Impacts requiring monitoring programme	Functional requirements for monitoring	Roles and responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementation
• Temporary hazardous waste storage • (Hazardous waste Sealed Container)	• Surface water and groundwater contamination; and • Soils contamination	• Site Inspections and checklists	• Contractor • Environmental representatives	• 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 review 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	• Rehabilitation efforts should be monitored and included in monthly environmental reports. Annual environmental audits should reflect this.

8 Frequency of the submission of the Performance Assessment Report

Annual environmental performance audit report will be undertaken by an independent EAP after the granting of the authorization. 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 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 external annual 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 (recommended annually).

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.

9 Environmental Awareness Plan

It will be the responsibility of both the contractors and the applicant alike to ensure that all the employees/contractors on site be thoroughly inducted with not only the Health and Safety Aspects but equally important the Environmental Awareness of the activities that they will be responsible for on site. This induction will include, but not be limited to:

- No-Go Areas
- Risk Assessments

- Reporting Structure for incidents and accidents
- Controls to ensure that the environment is safeguarded against any and all negative impacts
- Training sessions should incorporate the management plans addressed in the EMPr as well as any new information and documentation

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

Environmental conditions will be included in any operational contracts, thereby making contractors aware of the potential environmental risks associated with the project and the necessity to prevent accidental spillages by implementing good housekeeping practices. The following principles will apply to the Environmental Awareness Plan (Safety, Health and Environment):

- All personnel will as a minimum undergo general, SHE induction and awareness training.
- The Environmental Officer(s) or the responsible personnel from the SHEQ Department will identify the Safely, Health and Environment (SHE) training requirements for all personnel and contractors. The training requirements will be recorded in a training need matrix indicating particular training that must be undertaken by identified personnel and contractors. The training matrix will be administrated by the SHEQ Department.
- Development of a training programme: General Awareness training. The SHEQ Manager will be responsible for adopting and customising the existing SHE induction and awareness training being undertaken. It should include a general environmental awareness training module that will need to be integrated into the induction programme. The training manual shall include a review of the Environmental Policy, a review of significant environmental aspects, a description of the EMPr and the importance of compliance to its requirements, general responsibilities of personnel with regard to the EMPr and a review of the emergency and corrective action procedures.
- Specific environmental training:
    - Specific environmental training will be in line with the requirements identified in the training matrix;
    - People whose work tasks can impact the environment will be made aware of the requirements of appropriate procedures/ work instructions. The SHE Representative will communicate training requirements to responsible supervisors to ensure that personnel and contractors are trained accordingly.
- Training evaluation and re-training:
    - The effectiveness of the environmental training will be reflected by the degree of nonconformance to EMPr requirements, the results of internal and external audits and the general performance achieved.

Incidents and non-conformances raised against the EMPr will be assessed by the SHEQ Manager and SHE Representative(s) to determine the cause. Should it be evident that re-training is required the SHE Representative(s) will take the appropriate actions

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

- For the EMP to be successfully implemented, all the role players involved in the project need to cooperate. For this to happen, role players must clearly understand their roles and responsibilities in the project, must be professional, form respectful and transparent relationships, and maintain open lines of communication.

9.2.1 Responsibility of the Contractor

- The principal contractor is responsible for implementation and compliance with the requirements of the EMPr and conditions of the Environmental Authorisation, contract, and relevant environmental legislation. The Contractor must ensure that all sub-contractors have a copy of and are fully aware of the content and requirements of this EMPr.

9.2.2 Responsibility of the Environmental Officer(s) [EO] or the responsible personnel from the SHEQ Department

- The EO is employed by the Applicant as his/her environmental representative to monitor, review and verify compliance with the EMPr by the contractor. This is not an independent appointment; rather the EO must be a respected member of the contractor's management team. The EO must ensure that he/she is involved at all phases of the invasive prospecting activities (from site clearance to rehabilitation).

9.2.3 Responsibility of the Environmental Control Officer (ECO)

- The ECO must conduct, at a frequency as determined by the Department and stipulated in the relevant Environmental Authorisation (EA) for the project, independent environmental audits. The audits are to verify the project's compliance with the EMPr and conditions of the Environmental Authorisation (EA). Before any on-site activities commence, the ECO must compile, for the approval of the Department, an audit checklist based on the contents of this EMPr and conditions of the Environmental Authorisation (EA). The ECO must at the request of the Department forward audit reports to the Department at a frequency determined by the Department which must be stipulated in the Environmental Authorisation (EA). Evidence of the following as key performance indicators must be included in the audit reports where required:
  - Complaints received from landowners and actions taken.
  - Environmental incidents, such as oil spills, concrete spills, etc. and actions are taken (litigation excluded).
  - Incidents leading to litigation and legal contraventions.
  - The environmental damage that needs rehabilitation measures to be taken.

10 Specific information required by the Competent Authority

No specific information requirements have been made by the competent authority at this stage.

11 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 (these will be included once received, after the published comment period);
- 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 will correctly be reflected in the Final BAR.

Name of EAP:	Mrs Vumile Ribero
Signature of the EAP:	V. Ribeiro
Name of Company:	Niara Environmental Consultants (Pty) Ltd
Date:	22 August 2024

12 References

Department of Environmental affairs (DEA). 2004.National Environmental Management: Air quality act

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Department of Water and Sanitation (DWS). 1996. South African Water Quality Guidelines. Volume 7: Aquatic Ecosystems. Department of Water Affairs and Forestry, Pretoria.

Department of Water and Sanitation (DWS). 1999. Resource Directed Measures for Protection of Water Resources. Volume 2: Integrated Manual (Version 1). Department of Water Affairs and Forestry, Pretoria.

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Veltman, S., 2004. Establishment of the Regional Groundwater Monitoring Network at KOSH (Klerksdorp–Orkney–Stilfontein-Hartbeesfontein). GH 3987, Directorate: Free State Regional Office, Department of Water Affairs & Forestry.

Appendix A: CVs and Qualifications

Vumile Ribeiro

Director, Principal Environmental Consultant and Community Health Expert
Registered EAP No. 2019/1183

Address: 28 Shamrock Street, Ferndale Ext 3, Randburg 2194, Johannesburg
Email: vumile@niara.co.za
Contact No: +27 82 767 2786

EDUCATION AND QUALIFICATIONS

- BSocSc. (Geography and Environmental Management) University of KwaZulu Natal (2007)
- BSocSc. Hons. (Environmental Analysis and Management) University of Pretoria (2011)
- MPhil. (Environmental Law) University of Pretoria (current)

AFFILIATIONS

- Environmental Assessment Practitioners Association of South Africa (EAPASA)
- International Association of Impact Assessment South Africa (IAIASA)
- Public Health Association of South Africa (PHASA)
- Society of South African Geographers (SSAG)
- National Association for Clean Air (NACA)

YEARS OF EXPERIENCE

- 17 years

KEY COMPETENCIES

- Project Management
- Health Impact Assessments
- Community Health, Environmental Health

BIOGRAPHY

Vumile Ribeiro is the Director of Environmental Management Services at Niara Environmental Consultants (Pty) Ltd. Vumile has 17 years of professional and international experience in Environmental Assessment and Management primarily in the minerals resources and energy sector. Her roles include the operational management responsibilities of Niara Environmental Consultants, project management, report writing, client liaison, as well as business development.

Having worked for a multi-disciplinary advisory firms and environmental consultancies, Vumile has a competent understanding of the work effort and cross collaboration required for a successful multidisciplinary organisation. Vumile has been involved in a number of Environmental Impact Assessments and has a particular interest in health impacts assessments, water resource management, mining, energy and stakeholder engagement. Vumile has considerable experience across a range of developmental and environmental sciences and has worked in South Africa, Mozambique, Sierra Leone and Liberia and is familiar with Regulatory Environmental Legislation in other parts of Africa.

Vumile is very well versed in the IFC Environmental and Social Performance Standards (including IFC PS 2012) and the associated Equator Principles, which have informed the approach and standard for a number of ESIA processes that she has been involved in. Vumile is skilled at organising and driving effective project teams at a scale relevant to the project's requirements. She has technical experience and is able to quickly identify the most pertinent issues of a particular project whilst focussing on driving project success by rigorously implementing project management tools. Vumile's special interest areas involves understanding the systemic nature of factors that pose threats and opportunities in terms of establishing healthy, resilient communities, and exploring the use of various data types, approaches and methodologies to enable effective change.

- Legal Compliance Audits: Environmental / Health & Safety
- Environmental Control Officer
- Performance Assessments (Environmental Audits) on mine EMPrs
- Compliance Audits on Environmental Authorisations (e.g., ROD's, Water, Air and Waste Licenses)
- Consolidated Compliance Programmes
- Environmental Impact Assessments
- Basic Assessment Reports
- Mineral Law -Mining Rights and Permits
- Environmental Authorisation Applications
- Water Use License Applications
- Waste Management License Applications
- Co-ordinating and conducting Public Involvement processes.
- Social Assessment (Stakeholder and Social Analysis)
- Public Participation Process and Stakeholder consultation and mediation

COUNTRIES OF WORK EXPERIENCE

- Cameroon
- Democratic Republic of Congo
- Liberia
- Mozambique
- Sierra Leone
- South Africa
- Tanzania
- Zambia

LANGUAGES

English (excellent), Afrikaans (intermediate), siSwati (excellent), isiZulu (excellent) and Xhosa (excellent)

EMPLOYMENT HISTORY

June 2017 – present: Director: Environmental Management Services, Niara Environmental Consultants

March 2012 – May 2017: Environmental Consultant Human Sciences Department, Digby Wells Environmental, South Africa

January 2010 – December 2010: GIS Technician, Niara Environmental Consultants

October 2008 – October 2009: Client Service Executive, Ernst & Young

July 2007 – August 2008: GIS technician Capturer, Geospace International, (City of Tshwane Public Works and Infrastructure Development Department: Roads and Storm Water Division Project.)

April 2007 – July 2007: Mineral information Management Intern Department of Minerals and Energy, Mpumalanga Regional Office

EXPERIENCE HIGHLIGHTS

The below highlight key recent and relative project experience:

- Environmental Authorisation for Klipspruit Colliery – Inclusion of Pits S & G and Water Use License Application Process, Seriti Power (Pty) Ltd: Project Manager; Stakeholder Engagement Specialist
- Environmental Authorisation Application for The Springfield Colliery, Redan Siding and Vlakfontein Coal Mining Projects by Glubay Coal (Pty) Ltd in The District of Vereeniging and Meyerton, Gauteng: Health Impact Assessments and Social Impact Assessments: Social and Health Specialist and Reports Writer
- Graphit Kropfmühl - Community Impact Assessment for the GK Ancuabe Graphite Mine Graphit Kropfmühl Ancuabe Graphite Mine SA, Cabo Delgado Province Mozambique: Health Specialist and Report Writer
- Health Impact Assessment for the Mining Right Application for Iron Ore for Muhlava Mining on the Farms Berlyn 670 LT and Keulen 669 LT in Tzaneen, Limpopo Province, Titanium Mining (Pty) Ltd, Republic of South Africa: Health Specialist and Report Writer
- Nkomati Mine Closure Project: Community and Occupational Health Assessment Nkomati Joint Venture – a partnership between African Rainbow Minerals Limited and Norilsk Nickel Africa (Pty) Limited (Nkomati Mine
- Scoping EIA, Water Use License Application, Waste Management Licence Application for the Sasol Sigma Colliery Underground Ash Backfilling Project Sasol Mining (Pty) Ltd Republic of South Africa: Project Manager

Please consult the attached appendix for a comprehensive list detailing the project experiences undertaken.

APPENDIX A: PROJECT EXPERIENCE

Duration	Assignment name / brief description of main deliverables/outputs	Name of client and country of assignment	Role on the assignment
2012	Scoping EIA and Water Use License Application for the Bokoni Platinum Mine: Klipfontein Opencast Mining Operation	Bokoni Platinum Mines (Pty) Ltd Republic of South Africa	Project Administrator
2012	Amendment to City Deep EIA/EMP for the inclusion of Dump 3/L/40 and 3/L/42	Ergo Mining (Pty) Ltd Republic of South Africa	Project Assistant
2012	Community Health Baseline Study for Tonguma	Koidu Holdings Sierra Leone	Project Assistant / Report Writer
2012-2013	Community Health Impact Assessment for the Cooke Uranium Project re-mining of historic tailings facilities and establishment of a single large new Tailings Storage Facility for residual tailings	Gold One International Ltd Republic of South Africa	Health Specialist / Report Writer
2012-2013	Water Use Licence Compliance Audit	Ergo Mining (Pty) Ltd Republic of South Africa	Project Administrator
2013	Community Health Impact assessment for the Vedanta Power Plant and Associated Transmission Lines	Vedanta Zinc International Republic of South Africa	Health Specialist / Report Writer
2013	Community Health Impact Assessment for the Balama Graphite Mine	Syrah Resources Mozambique	Health Specialist / Report Writer
2013	Community Health Impact Assessment for the Putu Iron Ore Project	Atkins Global, Grand Gedeh County, Liberia	Project assistant for Health Impact Assessment
2013	Prospecting Right Application and Environmental Management Program Compilation for the St. Agnesfontein	Glenover Phosphate (Pty) Ltd / FermineOre, Republic of South Africa	Project Administrator
2013-2014	Scoping EIA, Water Use License Application, Waste Management Licence Application for the Sasol Sigma Colliery Underground Ash Backfilling Project	Sasol Mining (Pty) Ltd Republic of South Africa	Project Manager
2013-2014	Basic Assessment Report, Scoping EIA, Water Use License Application for the Sasol Syferfontein Block 4 Expansion Project	Sasol Mining (Pty) Ltd Republic of South Africa	Project Administrator
2013-2014	Community Health Impact Assessment for the Platreef underground platinum mine operation	Platreef Resources (PTY) Ltd Republic of South Africa	Health Specialist / Report Writer
2014	Submission of revised Environmental Impact Assessment and Environmental Management Programme for the Trichardtsfontein Project	Glencore Operations South Africa (Pty) Ltd, Republic of South Africa	Project Administrator / Report Co-author

Duration	Assignment name / brief description of main deliverables/outputs	Name of client and country of assignment	Role on the assignment
2014	Amendment to the Nooitgedacht Environmental Impact Assessment and Environmental Management Programme: Inclusion of Seams 2 and 4	Glencore Operations South Africa (Pty) Ltd, Republic of South Africa	Project Administrator / Report Co-author
2014	Community Impact Assessment for the proposed Kamiesberg heavy mineral sands mine Project	Zirco Roode Heuwel (Pty) Ltd Republic of South Africa	Health Specialist / Report Writer
2014	Community Impact Assessment for the proposed Tenge Iron Ore Project	Capitol Resources Limitada –subsidiary of Baobab Resources Plc, Mozambique	Health Specialist / Report Writer
2015	Integrated Water Use Licence Application and Integrated Waste Water Management Plan for the proposed Klipspruit Extension: Weltevreden	BHP Billiton Energy Coal South Africa Limited, Republic of South Africa	Project assistant for the WULA and IWWMP
2015	Integrated Water Use Licence Application for the proposed Middelburg – Mhluzi Powerline Project	Eskom SOC Holdings Limited Republic of South Africa	Project Manager / Report Writer for the WULA
2015	Community Health Impact Assessment for the proposed open-pit magnetite mine and concentrator plant	Pamish Investments No. 39 (Pty) Ltd Republic of South Africa	Health Specialist / Report Writer
2015	Environmental and Social Impact Assessment for the Proposed Nachu Graphite Project	Magnis Resources T/A Uranex Tanzania Ltd, Ruangwa District, Lindi Region Tanzania, East Africa	Health Impact Assessment Report Reviewer
2015	Integrated Water Use Licence Application and Integrated Waste Water Management Plan for the Lanxess Chrome Mine	Lanxess Mining (Pty) Ltd Republic of South Africa	Report Writer for the WULA and IWWMP
2015	De Groote Boom Mining Permit Application: Prescribed Environmental Management Programme	De Groote Boom Minerals (Pty) Ltd Republic of South Africa	Project Administrator and Report Writer
2015	Environmental Impact Assessment and Environmental Management Programme Report for the Proposed Realignment of the P141-1 Provincial Road, Tweefontein Mine Complex, Mpumalanga Province	Glencore Operations South Africa (Pty) Ltd	Report Compiler
2015	Water Use Licence Application for the Proposed Realignment of the P141-1 Provincial Road, Tweefontein Mine Complex, Mpumalanga Province	Glencore Operations South Africa (Pty) Ltd, Republic of South Africa	Report Writer for the WULA and IWWMP

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2015	Community Impact Assessment for the GK Ancuabe Graphite Mine	Graphit Kropfmühl Ancuabe Graphite Mine SA, Cabo Delgado Province Mozambique	Project Manager / Health Specialist / Report Writer
2015	Water Use Licence Application for the Proposed Roodekop Wetland Offset and Compensation Strategy Project	Universal Coal Development IV (Pty) Ltd Republic of South Africa	Report Writer for the WULA and IWWMP
2015	Water Use Licence Application for the proposed Lambda Substation near Volksrust, Mpumalanga and Associated 2 x 400kV & 2 x 765kV Loop in Transmission Line Project	Eskom SOC Holdings Limited Republic of South Africa	Project Manager
2016	Klipspruit Extension: Motivation for The Drilling Of Exploration Holes Within A Wetland	South32 Sa Coal Holdings (Pty) Ltd	Project Administrator / Report Writer
2016	Namane Generation Independent Power Producer and Transmission Line Project, near Lephalale, Limpopo	Namane Generation (Pty) Ltd	Health Specialist
2016	Risk Assessment and Associated General Authorisation for the Proposed KPSX Northern Bypass, in Mpumalanga	South32 SA Coal Holdings (Pty) Limited	Project Manager and Report Writer
2016	Environmental and Social Impact Assessment for the Massawa and Sofia Gold Project, Senegal	Randgold Resources Limited	Health Specialist
2016	Proposed Reclamation of the Grootvlei Tailings Storage Facilities Cluster, near Springs, Gauteng	Ergo Mining (Pty) Ltd Republic of South Africa	Health Specialist
2017	Environmental and Social Impact Assessment for the Proposed Ntem Iron Ore Project, in Cameroon: Health Impact Assessment Report	Caminex SA, Cameroon	Health Specialist
2017	Water Use Licence for the Proposed Pit H and Associated Infrastructure at KPSX: Weltevreden and KPSX: South Operations, in Mpumalanga	South32 SA Coal Holdings (Pty) Limited, Republic of South Africa	Project Manager and Report Writer
2017	Risk Assessment and Associated General Authorisation for the Proposed Substation and 132kV Power Lines in Ogies, Mpumalanga	Eskom Holdings SOC Limited, Republic of South Africa	Project Manager and Report Writer
2017	Wetlands Risk Assessment and Associated General Authorisation for the Proposed Geotechnical Drilling Project at Khutala Colliery, in Mpumalanga	South32 SA Coal Holdings (Pty) Limited, Republic of South Africa	Project Manager and Report Writer

Duration	Assignment name / brief description of main deliverables/outputs	Name of client and country of assignment	Role on the assignment
2017	Community Health Impact Assessment for the Proposed Phase 2 KwaMathukuza Housing Development in KwaMathukuza, Newcastle, KwaZulu-Natal	Phumaf Consulting Engineers, Republic of South Africa	Project Manager and Report Writer
2017	Odour Survey / Assessment for the Proposed Phase 2 KwaMathukuza Housing Development in KwaMathukuza, Newcastle, KwaZulu-Natal	Phumaf Consulting Engineers, Republic of South Africa	Project Manager and Report Writer
2017	Health Impact Assessment for the Mining Right Application for Iron Ore for Muhlava Mining on the Farms Berlyn 670 LT and Keulen 669 LT in Tzaneen, Limpopo Province	Titanium Mining (Pty) Ltd, Republic of South Africa	Project Manager and Report Writer
2017	Emakhazeni Coal Mining Project in the Eastern Basin Coalfield, Mpumalanga Province	Umsimbithi Mining (Pty) Ltd, Republic of South Africa	Health Specialist
2017	Odour Impact Survey for the Proposed Phase 2 KwaMathukuza Housing Development in KwaMathukuza, Newcastle, KwaZulu-Natal	Phumaf Consulting Engineers, Republic of South Africa	Project Manager and Report Writer
2018	Renewal of an Existing Integrated Water Use License for Vlakfontein Mine: Central Block, Ogies in Mpumalanga Province	African Exploration Mining and Finance Corporation SOC Limited (AEMFC)	Project Manager and Report Writer
2018	2017 IWWMP Update and Amendment for Eskom Lethabo Power Station in Free State	Eskom Holdings SOC Limited	Project Manager and Report Writer
2018	East Block External Integrated Water Use License Audit at Vlakfontein Mine, Ogies in Mpumalanga Province	African Exploration Mining and Finance Corporation SOC Limited (AEMFC)	Project Manager and Report Writer
2018	Waste Management License Application for NN Metals proposed listed activities of the scrap metal recycling operation located at 300 Mundt Street on Waltloo township ERF 110 in Pretoria within the City of Tshwane Metropolitan Municipality	NN Metals (Pty) Ltd, Pretoria, Republic of South Africa	Project Manager and Report Writer
2018	Community Health Impact Assessment for The Development of the Proposed Leslie 1 Coal Mining Project, near Leandra, Mpumalanga Province	Anglo Operations (Pty) Ltd and Leslie Coal Mine (Pty) Ltd	Health Specialist
2018	The Development of the Proposed Transformer Manufacturing, Repairing and Testing Facility at Portion 189 of the Farm Zandfontein 317JR, Kirkney Industrial Township, Pretoria West: Health Impact Assessment	Contipower (Pty) Ltd	Health Specialist

Duration	Assignment name / brief description of main deliverables/outputs	Name of client and country of assignment	Role on the assignment
2018	Elandsfontein Colliery: Oosbank Coal Siding Draft Environmental Management Programme	Anker Coal, Elandsfontein Colliery (Pty) Ltd	Project Manager and Report Writer
2018	Elandsfontein Colliery (Pty) Ltd: Elandsfontein Mine Integrated Water and Waste Management Plan Annual Update: 2018	Anker Coal, Elandsfontein Colliery (Pty) Ltd	Project Manager and Report Writer
2018	Rehabilitation, Decommissioning and Mine Closure Plan for the Proposed Woestalleen Holdings (Pty) Ltd Coal Mine in Middelburg, Mpumalanga Province	Woestalleen Holdings (Pty) Ltd	Project Manager and Report Writer
2019	Elandsfontein Colliery: Performance Assessment Audit Report on MP 63 MR Environmental Management Programme	Anker Coal, Elandsfontein Colliery (Pty) Ltd	Project Manager and Report Writer
2019	Community Health Impact Assessment The Development of the Proposed Matai Mining Project in Mankwe District, North West Province	Matai Mining (Pty) Ltd	Project Manager and Report Writer
2019	Social Impact Assessment The Development of the Proposed Matai Mining Project in Mankwe District, North West Province	Matai Mining (Pty) Ltd	Project Manager and Report Writer
2019	Health Impact Assessment Report The Development of the Proposed Panfontein Mining Project in the Magisterial District of Vereeniging, Gauteng Province	Richtrau 253 (Pty) Ltd	Project Manager and Report Writer
2019	Socio-economic Impact Assessment Report The Development of the Proposed Panfontein Mining Project in the Magisterial District of Vereeniging, Gauteng Province	Richtrau 253 (Pty) Ltd	Project Manager and Report Writer
2019	Elandsfontein Colliery (Pty) Ltd: Elandsfontein Mine Integrated Water and Waste Management Plan and RSIP Annual Update: 2019	Anker Coal, Elandsfontein Colliery (Pty) Ltd	Project Manager and Report Writer
2019	Vlakfontein Colliery Financial Provision Assessment: 2019	African Exploration Mining and Finance Corporation (SOC) Ltd (AEMFC)	Project Manager and Report Reviewer
2019	Inyanda Coal Mine Integrated Water and Waste Management Plan Update: 2019	Inyanda Mining Holdings (Pty) Ltd	Report Writer

Duration	Assignment name / brief description of main deliverables/outputs	Name of client and country of assignment	Role on the assignment
2019	Inyanda Coal Mine Rehabilitation Strategy and Implementation Plan	Inyanda Mining Holdings (Pty) Ltd	Report Writer
2019	Health Risk Assessment for The Proposed Residential Development on Various Portions of The Farm Rooikoppies 297-JQ	Seaton Thomson and Associates Cc	Specialist and Report Writer
2019	Application for Environmental Authorisation and A Change of Land Use for the Proposed Musina-Makhado Special Economic Zone (SEZ) in the Limpopo Province Health Impact Assessment Report	Limpopo Economic Development Agency (LEDA)	Specialist and Report Writer
2019	Integrated Environmental Authorisation Process for the Proposed Weltevreden Mining Right Application, Socio-economic Impact Assessment Report	Saldomate (Pty) Ltd	Specialist and Report Writer
2019	Integrated Environmental Authorisation Process for the Proposed Wildebeestfontein Mining Right Application, Socio-economic Impact Assessment Report and Social and Labour Plan	Opsirex (Pty) Ltd	Specialist and Report Writer
2020	Proposed Aggregate and Gravel Mining in Bizana, Eastern Cape: Social and Labour Plan	Ilitye Industrial (Pty) Ltd	Specialist and Report Writer
2020	Integrated Water Use Licence Application and IWWMP: Inyanda Coal Mine Rehabilitation Strategy and Implementation Plan	Inyanda Mining Holdings (Pty) Ltd	Report Writer
2020	Integrated Water Use Licence Application and IWWMP: The Development of the Proposed Panfontein Mining Project in the Magisterial District of Vereeniging, Gauteng Province	Richtrau 253 (Pty) Ltd	Project Manager and Report Writer
2020	Integrated Environmental Authorisation Process for the Proposed Van Oudshoornstroom Mining Right Application: Socio-economic Impact Assessment Report	Estate Late Philippus Christoffel Johannes De Jager	Specialist and Report Writer
2020	Nkomati Mine Closure Project: Community and Occupational Health Assessment	Nkomati Joint Venture – a partnership between African Rainbow Minerals Limited and Norilsk Nickel Africa (Pty) Limited (Nkomati Mine	Specialist and Report Writer
2020	Social Impact Assessment Report for the Development of the Proposed Zelpy Kafferskraal Mining Right Application	Zelpy Gold Mine (Pty) Ltd	Specialist and Report Writer

Duration	Assignment name / brief description of main deliverables/outputs	Name of client and country of assignment	Role on the assignment
2020	Health Impact Assessment Report for the Development of the Proposed Zelpy Kafferskraal Mining Right Application	Zelpy Gold Mine (Pty) Ltd	Specialist and Report Writer
2020	Environmental Authorisation and Water Use Licence Application for The Electrisurv Cc Beneficiation Plant	Electrisurv Surveying CC	Project Manager and Reports Writer
2020	Mining Right Application of the Proposed Springfield Opencast Colliery, near Meyerton & Vereeniging in the Gauteng Province: Health Impact Assessment	Glubay Coal (Pty) Ltd, an affiliated company of Canyon Resources (Pty) Ltd	Specialist and Report Writer
2020	Koppie Canyon Mining Right Application near Hendrina, Mpumalanga: Social Impact Assessment Report and Social and Labour Plan	Canyon Resources (Pty) Ltd	Specialist and Report Writer
2020	Risenga Colliery Water Use Licence Application: Integrated Water and Waste Management Plan	SARMCO Group (Pty) Ltd	Project Manager and Report Writer
2021	Integrated Water and Waste Management Plan (IWWMP) for the Proposed Samara Prospecting Right near Barkley West, Northern Cape	Samara Mining (Pty) Ltd	Specialist and Report Writer
2021	Social Impact Assessment Report and Social and Labour Plan for the Development of the Lakeside Colliery S102 Amendment	Zomhlaba Resources (Pty) Ltd	Specialist and Report Writer
2021	Social Impact Assessment Report and Social and Labour Plan for the Development of the Leeuwfontein Colliery S102 Amendment	Zomhlaba Resources (Pty) Ltd	Specialist and Report Writer
2021	Health Impact Assessment Report for the Development of the Proposed Ericure Dannhauser Coal Project	Ericure (Pty) Ltd	Specialist and Report Writer
2021	Application for Environmental Authorisation and Water Use Licence Application for the Proposed Middelburg Mining Services (MMS) Boschmanskrans Section Implementation of Wetland Mitigation and Offset Strategy: Social Impact Assessment	South32 SA Coal Holdings (Pty) Limited: South Africa Energy Coal	Specialist and Report Writer
2021	Application for General Authorisation: Ifalethu Colliery, Middelburg, Mpumalanga	South32 SA Coal Holdings (Pty) Limited: South Africa Energy Coal	Specialist and Report Writer

Duration	Assignment name / brief description of main deliverables/outputs	Name of client and country of assignment	Role on the assignment
2021	Application for Environmental Authorisation and Water Use Licence Application for the Proposed Middelburg Mining Services (MMS) Boschmanskrans Section Implementation of Wetland Mitigation and Offset Strategy: Water Use Licence Application	South32 SA Coal Holdings (Pty) Limited: South Africa Energy Coal	Specialist and Report Writer
2021	Social Impact Assessment for the Proposed Farm Marsh Lusern and Hydroponics Systems Project: Social Impact Assessment	Sishen Iron Ore Company (Pty) Ltd	Specialist and Report Writer
2021	Environmental Regulatory Process Required for the Proposed Wolvekrans Colliery Boschmanskrans Section Mining Extension Project Wetland Mitigation and Offset Strategy near Middelburg, Mpumalanga	South32 SA Coal Holdings (Pty) Ltd	Project Manager
2021	Water Use Licence Application for the Proposed Wolvekrans Colliery Boschmanskrans Section Mining Extension Project Wetland Mitigation and Offset Strategy	South32 SA Coal Holdings (Pty) Ltd	Specialist and Report Writer
2021	Social Impact Assessment for the Proposed Wolvekrans Colliery Boschmanskrans Section Mining Extension Project Wetland Mitigation and Offset Strategy	South32 SA Coal Holdings (Pty) Ltd	Specialist and Report Writer
2021	Environmental Impact Assessment and IWUL for the Proposed Ikwezi Vanadium Mine, near Northam	Ikwezi Mining (Pty) Ltd	Project Manager
2021	Social Impact Assessment and IWUL for the Proposed Ikwezi Vanadium Mine, near Northam	Ikwezi Mining (Pty) Ltd	Specialist and Report Writer
2021	Integrated Environmental Authorisation Process for The Proposed Aangewys Coal Mine Mining Right Application: Social Impact Assessment	National Treasure Minerals (Pty) Ltd	Specialist and Report Writer
2021	Social and Labour Plan for The Proposed Straffontein Colliery Mining Right Application	Mnambithi Mining (Pty) Ltd	Specialist and Report Writer
2021	Integrated Environmental Authorisation Process for The Proposed Straffontein Colliery Mining Right Application: Social Impact Assessment	Mnambithi Mining (Pty) Ltd	Specialist and Report Writer
2021	Environmental Authorisation and Water Use Licence Application for The Construction of the Doornpoort Pumping Main and Pump Station Project	eMalahleni Local Municipality	Project Manager and Report Writer
2021	Environmental Audit Report for Sekoko Coal – 2021	M3P Mining (Pty) Ltd	Project Manager

Duration	Assignment name / brief description of main deliverables/outputs	Name of client and country of assignment	Role on the assignment
2021	Environmental Authorisation required for Prospecting Right Application on various Portions of the Farm Schaapkopje 194 HT, 5km North of Vryheid Town in the AbaQulusi Local Municipality, KwaZulu Natal	Tuutuuka Resources (Pty) Ltd	Project Manager and Report Writer
2021	Basic Assessment Process and Water Use Licence Application for the Alignment of the Klipspruit Colliery Environmental Management Programme for Klipspruit Colliery, Mpumalanga Province	Seriti Power (Pty) Ltd	Project Manager and Report Writer
2022	Social and Labour Plan for The Proposed Roodepoort Coal Mine	Roodepoort Coal (Pty) Ltd	Specialist and Report Writer
2022	Social Impact Assessment for The Proposed Roodepoort Coal Mine on Farm Roodepoort 40 Is Portion 15, Nkangala District Municipality Within the EMalahleni Local Municipality, Mpumalanga Province	Roodepoort Coal (Pty) Ltd	Specialist and Report Writer
2022	Social and Labour Plan for Kleinwater Colliery	Madini Mining (Pty) Ltd	Specialist and Report Writer
2022	Social Impact Assessment for the Section 102 Amendment in Respect of Portions 2, 8, 9 of the Farm Kleinwater 301 JS, Portions 11, 39, 40 Of the Farm Doornrug 302 JS, and the Remaining Extent of the Farm Rondebult 303 JS, eMalahleni Local Municipality, Mpumalanga	Madini Mining (Pty) Ltd	Specialist and Report Writer
2022	Health Impact Assessment for the Proposed Nellmapius Extension 26 Township on Various Portions of The Farm Hatherley 331 JR, City of Tshwane Metropolitan Council	Tambura 69 Trust	Specialist and Report Writer
2022	Environmental Impact Assessment (EIA) and Water Use Licence Application for The Grootlaagte Opencast Mine Mining Right Application Situated in The Steve Tshwete Local Municipality, Nkangala District Municipality in Mpumalanga	Arnot OpCo (Pty) Ltd	Project Manager and Report Writer
2022	Basic Assessment Process and Water Use Licence for The Proposed Upgrade of Weltevreden Wetland Interventions	Seriti Power (Pty) Ltd	Project Manager and Report Writer
2022	Social Impact Assessment for the Blesboklaagte S102 EA IWUL and WL	Eyethu Coal (Pty) Ltd	Specialist and Report Writer

Duration	Assignment name / brief description of main deliverables/outputs	Name of client and country of assignment	Role on the assignment
2022	Environmental Authorisation for Klipspruit Colliery - Pit H: Regulation 31 Amendment and Water Use License Application	Seriti Power (Pty) Ltd	Project Manager and Report Writer
2022	Social Impact Assessment for the proposed Wonderhoek Open Cast Coal Mine near Middelburg, Mpumalanga Province	Wonderhoek Colliery (Pty) Ltd	Specialist and Report Writer
2022	Community Health Impact Assessment for the proposed Interwaste Brakkefontein Waste Management Facility near Atlantis, Western Cape	SLR Consulting on behalf of Interwaste (Pty) Ltd	Specialist and Report Writer
2022	Community Health Impact Assessment for the proposed Wonderhoek Open Cast Coal Mine near Middelburg, Mpumalanga Province	Wonderhoek Colliery (Pty) Ltd	Specialist and Report Writer
2022	Community Health Impact Assessment for the proposed Schurvekop Underground Coal Mine near Bethal in Mpumalanga	Mmakau Coal (Pty) Ltd	Specialist and Report Writer
2022	Public Participation Process in Support of the Queenstown Quarry S102 Amendment Process, Eastern Cape	Raumix Aggregates, a subsidiary of Raubex Group Ltd	PPP and Stakeholder Engagement Specialist
2022	Community Health Impact Assessment for the proposed Arengo Iron-Ore Project	Arengo 297 (Pty) Ltd	Specialist and Report Writer
2022	Water Use Licence Application and Associated Specialist Studies for the proposed Idwala Coal Mine	Idwala Coal Mine (Pty) Ltd	Specialist and Report Writer
2022	Rapid Appraisal Health Impact Assessment for the Proposed Platinum Pride Crematorium in Cape Town	Sharples Environmental Services cc (SES)	Specialist and Report Writer
2022	Rapid Appraisal Health Impact Assessment for the Proposed Construction and Operation of a Cement Grinding Facility and Storage of Dangerous Goods Located in Blackheath Within the City of Cape Town Municipality	Cemza Coastal (Pty) Ltd	Specialist and Report Writer
2022	Environmental Authorisation for Klipspruit Colliery – Inclusion of Pits S & G and Water Use License Application Process	Seriti Power (Pty) Ltd	Project Manager; Stakeholder Engagement Specialist

Duration	Assignment name / brief description of main deliverables/outputs	Name of client and country of assignment	Role on the assignment
2022-2023	ZNT 03 EDTEA 2021/2022 KwaZulu-Natal Air Quality Management Plan Draft Air Quality Management Plan – Provincial Stakeholder Engagement / PPP	Kwazulu-Natal: Department of Economic Development, Tourism and Environmental Affairs	PPP and Stakeholder Engagement Specialist
2023	Community Health Impact Assessment for the proposed Holfontein Waste Management Facility Expansion Project	EnviroServ Waste Management (Pty) Ltd	
2023	Social Impact Assessment for the Proposed Highbury Mining Right Application in the Magisterial District of Port Shepstone in the Ray Nkonyeni Local Municipality, KwaZulu Natal Province	SA Lithium (Pty) Ltd	Specialist and Report Writer
2023	Environmental Authorisation Process for the proposed Pivaanspoort Prospecting Right Application in Vryheid, KwaZulu-Natal	Pivaanspoort Mining (Pty) Ltd	PPP and Stakeholder Engagement Specialist
2023	Rapid Appraisal Health Impact Assessment for the Proposed Housing Development on Erf 43937 in Colorado Park, Mitchell's Plain	The City of Cape Town (CoCT) Metropolitan Municipality	Specialist and Report Writer
2023	Health Impact Assessment for the Proposed Highbury Mining Right Application in the Magisterial District of Port Shepstone in the Ray Nkonyeni Local Municipality, KwaZulu Natal Province	SA Lithium (Pty) Ltd	Specialist and Report Writer
2023	Public Participation Process for the proposed Wonderhoek Open Cast Coal Mine near Middelburg, Mpumalanga Province	Wonderhoek Colliery (Pty) Ltd	PPP and Stakeholder Engagement Specialist
2023	Environmental Authorisation Application for The Vlakfontein Coal Mining Project by Glubay Coal (Pty) Ltd in The District of Vereeniging and Meyerton, Gauteng: Health Impact Assessment	Glubay Coal (Pty) Ltd	Specialist and Report Writer
2023	Community Health Impact Assessment for the Proposed Multisand General Waste Management Facility Project	Multisand (Pty) Ltd	Specialist and Report Writer
2023	Seriti MMS Environmental Management Programme (EMPr) Consolidation	Seriti Coal (Pty) Ltd	Project Manager and Report Writer
2023	Randfontein Estates Limited: Doornkop Underground Mining Operations Water Use Licence Application (WU29548) and Associated Specialist Studies	Randfontein Estates Limited (a subsidiary of Harmony Gold Mining Company Limited)	Project Manager, Report Compiler and Reviewer

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2023	Klipspruit Extension EIA and WUL: Alignment from opencast to underground	Seriti Coal (Pty) Ltd	Project Manager, Report Compiler and Reviewer
2023	Integrated Environmental Authorisation Process for the Proposed Coastal Fuels: Alkmaar Mining Right Application: Social Impact Assessment	Coastal Fuels	Specialist and Report Writer
2023	Environmental Authorisation Application for The Redan Siding Project by Glubay Coal (Pty) Ltd in The District of Vereeniging and Meyerton, Gauteng: Health Impact Assessment	Glubay Coal (Pty) Ltd	Specialist and Report Writer
2023	Environmental Services for the Upgrade of N11 Section 3 from Newcastle South (KM 50.00) to Ncandu River (KM 57.20) in KwaZulu-Natal Province: Socio-Economic Impact Assessment	South African National Roads Agency SOC Ltd	Specialist and Report Writer
2023	Health Impact Assessment for the Proposed Manganese Slag Processing Plant and Associated Infrastructure in eMalahleni,	Zonglin Resources (Pty) Ltd	Specialist and Report Writer
2023	Community Health Impact Assessment for the Shiva Uranium Mine in the North West Province	Industrial Development Corporation of South Africa Limited (IDC)	Specialist and Report Writer
2023	Health Impact Assessment for the Proposed Samancor TC Smelter Plant: Addition of Two 70 MW Furnaces	Samancor Terris Chrome Smelters Ltd (Pty)	Specialist and Report Writer
2023	Environmental Control Officer Services for Water Conservation and Demand Management in Standerton	Gert Sibande District Municipality	Specialist and Report Writer
2024	Social Impact Assessment for the proposed Bengwenyama Underground Mining Project in the Sekhukhune District Municipality, Limpopo	Miracle Upon Miracle Investments (Pty) Ltd	Specialist and Report Writer
2024	Social Impact Assessment for the Proposed the Development of Coal Mine within Abaqulusi Local Municipality of Zululand District Municipality, KwaZulu Natal Province	Amora Properties (Pty) Ltd	Specialist and Report Writer
2024	External Environmental Audits for MMS (EMPRs, WULS, and WML Audits)	Seriti Power (Pty) Ltd	Specialist and Report Writer
2024	Seriti MMS General Authorisation for Exploration Drilling on Portions 15 and 16	Seriti Power (Pty) Ltd	Specialist and Report Writer

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2024	Social Impact Assessment Study for the proposed Palmietfontein Mining Right Application, in the Moses Kotane Local Municipality	Palm Chrome (Pty) Ltd	Specialist and Report Writer
2024	Social Impact Assessment Study for the Izimbiwa Coal Banana Republic (Rietfontein Colliery) S102 Amendment Process, near Middelburg, Mpumalanga	Izimbiwa Coal (Pty) Ltd	Specialist and Report Writer
2024	Social Impact Assessment Study for the Izimbiwa Coal Townlands (Uitkyk Colliery) S102 Amendment Process, near Middelburg, Mpumalanga	Izimbiwa Coal (Pty) Ltd	Specialist and Report Writer
2024	Social and Labour Plan for the proposed Palmietfontein Mining Right Application, in the Moses Kotane Local Municipality	Palm Chrome (Pty) Ltd	Specialist and Report Writer
2024	Social Impact Assessment for the proposed Samancor Western Chrome Mine, near Mooinooi, in the North West Province	Samancor Chrome (Pty) Ltd	Specialist and Report Writer
2024	Social Impact Assessment for the Ivanplats Application for Integrated Environmental Authorisation for the proposed Dry Stack TSF Project	Ivanplats (Pty) Ltd	Specialist and Report Writer
2024	Public Participation Process/ Stakeholder Engagement for the Ivanplats Application for Integrated Environmental Authorisation for the proposed Dry Stack TSF Project	Ivanplats (Pty) Ltd	Specialist and Report Writer
2024	Social Impact Assessment for the proposed Fuleni Mining Project within King Cetshwayo District Municipality, uMfolozi Municipality, Kwa-Zulu Natal Province	Imvukuzane Resources (Pty) Ltd	Specialist and Report Writer
2024	Kusasalethu Deelkraal Water Use Licence and GN 704 Audits	Harmony Gold Mining Company Limited	Specialist and Report Writer
2024	Health Impact Assessment for the proposed Fuleni Mining Project within King Cetshwayo District Municipality, uMfolozi Municipality, Kwa-Zulu Natal Province	Imvukuzane Resources (Pty) Ltd	Specialist and Report Writer
2024	Health Impact Assessment for the proposed Underground Expansion Project at East and West Mines for Tharisa Minerals Near Marikana, North West Province	Tharisa Minerals (Pty) Ltd	Specialist and Report Writer

Environmental Assessment Practitioners Association of South Africa

Registration No. 2019/1183

Herewith certifies that

Vumile Celiwe Ribeiro

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

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Environmental Assessment Practitioners Association of South Africa
Advancing environmental assessment practice in South Africa

Mrs Vumile Ribeiro
28 Shamrock Street
Ferndale
Randburg
2194

Sent by email to: vumile@niara.co.za

Dear Mrs Ribeiro

Registered Environmental Assessment Practitioner: Number 2019/1183
Vumile Celiwe Ribeiro : South African ID 8605090831080

The Environmental Assessment Practitioners Association of South Africa (EAPASA) herewith certifies that Vumile Celiwe Ribeiro is a Registered Environmental Assessment Practitioner (EAP) 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).

Your registration is duly authorised by EAPASA as the single Registration Authority for EAPs in South Africa (appointed as per Regulation No. 104, Gazette No. 41434 of 8 February 2018, in terms of section 24H(3)(a) of the NEMA). Your status as a Registered EAP is displayed in the 'EAP Register' - please find your name and contact email address at

https://registration.eapasa.org/registered-practitioners

Your registration is effective for a period of five years from 08 February 2024, and expires on 08 February 2029. The renewal of your registration in 2029 will be contingent on you having met the requirements of EAPASA's Continuing Professional Development (CPD) policy during each year of registration.

As a Registered EAP you are required to uphold the EAPASA Code of Ethical Conduct and Practice in your professional endeavours, towards the goal of quality assurance in environmental assessment practice.

Please accept my congratulations on your registration.

Best regards

Dr Patrick Sithole
Registrar
Date: 08 February 2024

IAIAsa Secretariat
Tel +27(0)11 655 7183
Fax 086 662 9849

Address:
43 Birchwood Court, Montrose Street, Vorna Valley, Midrand, 1618

Postal address:
PO Box 11666, Vorna Valley, 1686

Email: operations@iaiasa.co.za

Website: www.iaiasa.co.za

IAIAsa Confirmation of Membership: 2024/2025

Vumile Ribeiro | Membership no: 5925

TO WHOM IT MAY CONCERN

This certificate confirms that Vumile Ribeiro, from Niara Environmental Consultants (Pty) Ltd with membership number: 5925 is a paid-up Full Member in good standing of the International Association for Impact Assessment South Africa and has been a member of IAIAsa since Thursday, March 1, 2018 to date.

This membership is valid from 1 March 2024 to 28 February 2025.

IAIAsa is a voluntary organisation and is not a statutory body regulating the profession. Its members are however expected to abide by the organisation's code of ethics which is available on our website.

IAIAsa is an Affiliate of IAIA, which is an international body, through a memorandum of understanding. IAIA is not responsible or liable for the actions or activities of the Affiliates. Membership of one does not imply membership of the other.

Any enquiries regarding this membership may be directed to the Secretariat at the above contact details.

Yours sincerely

Greg Beyers
President 2023/2024

IAIAsa Secretariat
Tel +27(0)11 655 7183
Fax 086 662 9849

Address:
43 Birchwood Court, Montrose Street, Vorna Valley, Midrand, 1618

Postal address:
PO Box 11666, Vorna Valley, 1686
Email: operations@iaiasa.co.za
Website: www.iaiasa.co.za

IAIAsa Confirmation of Membership: 2024/2025
Vumile Ribeiro (Dlamini) Membership Number: 5925

04 Mar 2024

TO WHOM IT MAY CONCERN

Mrs Vumile Ribeiro (Dlamini), Niara Environmental Consultants (IAIAsa membership Number **5925**) is a paid-up Full Member in good standing of International Association for Impact Assessment, South Africa and has been a member of IAIAsa since 01 Mar 2018.

Membership has been continous from 01 Mar 2018 to date.

This membership is valid from 01 Mar 2024 to 28 Feb 2025.

IAIAsa is a voluntary organisation and is not a statutory body regulating the profession. Its members are however expected to abide by the organisation's code of ethics which is available on our website.

IAIAsa is an Affiliate of IAIA which is an international body through a memorandum of understanding. IAIA is not responsible or liable for the actions or activities of the Affiliates. Membership of one does not imply membership of the other.

Any enquiries regarding this membership may be directed to the Secretariat at the above contact details.

Yours sincerely

Greg Beyers
President 2023/2024

PHASA
Public Health Association of South Africa

MEMBERSHIP CERTIFICATE

This certifies that

Vumile Ribeiro

is a registered member of the **Public Health Association of South Africa**

Membership number: 2022378

Membership period ends: 03-18-2025

19th March 2024

Date

PHASA President

Secretariat Enquiries

secretariat@phasa.org.za or phasa.info@gmail.com

28419660

University of Pretoria

The Council and Senate hereby declare that
at a congregation of the University the degree

Bachelor of Social Sciences Honours

in

Environmental Analysis and Management

with all the associated rights and privileges
was conferred on

Vumile Celiwe Dlamini

in terms of the Higher Education Act, 1997 and the Statute of the University

On behalf of the Council and Senate

Vice-Chancellor and Principal

On behalf of the Faculty of Humanities

Dean (Acting)

Registrar

2012-04-23

CERTIFIED A TRUE COPY
OF THE ORIGINAL

Tshegofatso Mokoena
13 Eton Road
Parktown, 2193, Johannesburg
Commissioner of Oaths *Ex Officio*
Practising Attorney
Republic of South Africa
04/08/2023

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Denkleiers • Leading Minds • Dikgopolo tša Dihlalefi

STUDENT NUMBER	28419660
SURNAME	Dlamini
FIRST NAMES	Vumile Celiwe
DATE OF BIRTH	1986-05-09
TYPE OF EXEMPTION	Gr 12 not required
DATE ISSUED	2012-02-23

LIST OF COURSES PASSED

2011 (Full-time)	Program: BSocSci Hons		Plan: Environmental Anal and Mngm	
Course offering	**Description**	**Academic progress unit**	**%**	**Decision result**
GGY 793	Geography of land reform 793	20	75	A- (Pass with distinction)
GGY 785	Env impact assess and man 785	20	68	B+ (Pass)
GGY 780	Urban geography of SA 780	20	75	A- (Pass with distinction)
GGY 729	Industrial environmental 729	20	78	A- (Pass with distinction)
GGY 727	Environmental compliance 727	20	68	B+ (Pass)
GGY 711	Environmental principles 711	20	75	A- (Pass with distinction)
GGY 703	Research and presen skills 703	10	68	B+ (Pass)
GGY 702	Geography Project 702	30	73	B+ (Pass)

Term percentage average: **72.81**
Cumulative Percentage Average: **72.81**

Outcome: Bachelor of Social Sciences Honours

The abovementioned student formally complied with all the requirements for the qualification: Bachelor of Social Sciences Honours on 2012-01-31 and this qualification will be conferred/issued on 2012-04-23

2012 (Full-time)	Program: BSocSci Hons		Plan: Environmental Anal and Mngm	
	In partial fulfilment of the requirements for Bachelor of Social Sciences Honours			
Course offering	**Description**	**Academic progress unit**	**%**	**Decision result**

Term percentage average: **0.00**
Cumulative Percentage Average: **72.81**

for **REGISTRAR**

OFFICE OF THE DEAN
FACULTY OF HUMANITIES
21 FEB 2012
STUDENTEADMINISTRASIE
STUDENT ADMINISTRATION
UNIV VAN/OF PRETORIA

SOUTH AFRICAN POLICE SERVICE
2012 -03- 25

I CERTIFY THAT THIS IS A TRUE REPRODUCTION (COPY) OF THE ORIGINAL DOCUMENT. I FURTHER CERTIFY THAT FROM MY OBSERVATIONS, AN AMENDMENT OR A CHANGE WAS NOT MADE TO THE ORIGINAL DOCUMENT
SIGNATURE
RANK
FORCE NUMBER
NAME IN PRINT

University of Pretoria

Faculty of Natural and Agricultural Sciences

Centre for Environmental Studies

This is to certify that

VC Dlamini

has successfully completed the

Basic Training Course for Environmental Inspection

July to December 2011

CERTIFIED A TRUE COPY
OF THE ORIGINAL

Tshegofatso Mokoena
13 Eton Road
Parktown, 2193, Johannesburg
Commissioner of Oaths *Ex Officio*
Practising Attorney
Republic of South Africa
04/08/2023

Course Leader

General Manager CE and CP

UNIVERSITY OF KWAZULU-NATAL

The Universities of Durban-Westville and Natal merged
to become the University of KwaZulu-Natal on 1 January 2004

This is to certify that

Vumile Celiwe Dlamini

was admitted this day
at a congregation of the University
to the degree of

Bachelor of Social Science
(Geography and Environmental Management)

having satisfied the conditions prescribed for the degree.

M W Makgoba
Vice-Chancellor

E Mnensy
Registrar

D P McCracken
Dean

CERTIFIED A TRUE COPY
OF THE ORIGINAL

Tshegofatso Mokoena
13 Eton Road
Parktown, 2193, Johannesburg
Commissioner of Oaths *Ex Officio*
Practising Attorney
Republic of South Africa
04/08/2023

23 April 2007

THE GLOBAL HEALTH NETWORK

Enabling research by sharing knowledge

Hereby Certifies that

VUMILE DLAMINI

has completed the e-learning course

INTRODUCTION TO CLINICAL RESEARCH

with a score of

89%

on

05/12/2018

This e-learning course has been formally recognised for its quality and content by the following organisations and institutions

WWARN

EACCR

LSTM LIVERPOOL SCHOOL OF TROPICAL MEDICINE

THE GLOBAL HEALTH NETWORK

Enabling research by sharing knowledge

Global Health Training Centre
globalhealthtrainingcentre.org/elearning

Certificate Number 579917

Nolwazi Dlamini

Jnr Environmental Consultant
Registered EAP No. 2022/5249

Address: 74 Vista drive,Glenvista Johannesburg
Email: Nolwazi@niara.co.za
Contact No: +27 83 690 9515

EDUCATION AND QUALIFICATIONS

- BSocSc. (Geography and Environmental Management) University of KwaZulu Natal (2020)
- BSc. Hons. (Geography) University of Witwatersrand (2021)

AFFILIATIONS

- Environmental Assessment Practitioners Association of South Africa (EAPASA)

YEARS OF EXPERIENCE

- 2 years

KEY COMPETENCIES

- Project Management
- Legal Compliance Audits: Environmental / Health & Safety
- Environmental Control Officer
- Performance Assessments (Environmental Audits) on mine EMPrs
- Compliance Audits on Environmental Authorisations (e.g., ROD's, Water, Air and Waste Licenses)
- Consolidated Compliance Programmes
- Environmental Impact Assessments
- Basic Assessment Reports
- Mineral Law -Mining Rights and Permits

BIOGRAPHY

Nolwazi Dlamini is an environmental professional who has more than two (2) years of experience working in the Environmental Management field. She currently holds the title of junior environmental consultant at Niara Environmental Consultants (Pty) Ltd . She has more than one (1) year working as an Environmental Assessment Practitioner (EAP) in the mining sector where she has performed numerous environmental assessments (Environmental audits, financial provision & WML applications), Water Use Licence Application (WULA) as well as Basic assessment reports (BAR), Scoping and Environmental impact assessment(S&EIA) and Environmental management programmes (EMPr). One (1) year working as an Environmental Consultant in the petroleum industry where she worked under a Air quality specialist and was responsible for environmental compliance monitoring for Engen depots and Retail sites (EA & EMP); Retail & commercial site EIA gap closure monitoring; Air emission (AEL) & water use License (WUL) compliance as well as preparing internal environmental procedures (Air emission, waste, environmental safety).She is a seasoned Environmental Assessment Practitioner with a thorough understanding of the potential environmental and social impacts of activities in a variety of environmental settings. Her core competencies include research and report writing, specialist report review and environmental impact assessments

EMPLOYMENT HISTORY

July 2024 – present: Jnr Environmental Consultant, Niara Environmental Consultants (Pty) Ltd

May 2023 – May 2024: Petroleum & Environmental Consultant,Vahlengwe mining Advisory and Consulting, South Africa

December 2021 – December 2022: Environmental intern, Engen Petroleum, South Africa

- Environmental Authorisation Applications
- Water Use License Applications
- Waste Management License Applications
- Co-ordinating and conducting Public Involvement processes.
- Social Assessment (Stakeholder and Social Analysis)
- Public Participation Process and Stakeholder consultation and mediation
- GIS

COUNTRIES OF WORK EXPERIENCE

- South Africa

LANGUAGES

English (excellent),Sesotho (intermediate), siSwati (excellent), and isiZulu (excellent)

EXPERIENCE HIGHLIGHTS

The below highlight key recent and relative project experience:

- BAR & EMPr, Section 102 for
- Scoping and EIA , Prospecting Right application for Gomeza Trading (PTY) Ltd
- BAR & EMPR, Waste Management licence for Mona Le Mane (Pty) Ltd
- BAR & Empr, Prospecting Right application for Podlet (Pty) Ltd
- Environmental compliance monitoring & Financial provision for Franco Sand and Stone (Pty) Ltd
- Environmental compliance monitoring & Financial provision for Ngwenya Mine (Pty) Ltd
- Environmental compliance monitoring & Financial provision for Analiza boedery (Pty) Ltd
- Environmental compliance monitoring of Engen Deports (Langlaagte,Kempton park, witbank)

Please consult the attached appendix for a comprehensive list detailing the project experiences undertaken.

APPENDIX A: PROJECT EXPERIENCE

Duration	Assignment name / brief description of main deliverables/outputs	Name of client and country of assignment	Role on the assignment
2024	BAR & EMPr, Regulation 31 amendment for Harmony :Doornkop	Harmony Gold Mining Company Limited	Project assistant & Report compiler
2024	BAR & EMPr , Section 102 application for Ngobeni family Trust	Ngobeni family trust	Project assistant & Report reviewer
2024	Environmental compliance monitoring & Financial provision for Insite trading (Pty) Ltd	Insite trading (Pty) Ltd	Auditor & Report compiler
2024	Scoping and EIA , Prospecting Right application for Gomeza Trading (PTY) Ltd	Gomeza Trading (PTY) Ltd	Project lead & Report Compiler
2024	BAR & EMPR, Waste Management licence for Mona Le Mane (Pty) Ltd	Mona Le Mane (Pty) Ltd	Project lead & Report Compiler
2024	BAR & Empr, Prospecting Right application for Podlet (Pty) Ltd	Podlet (Pty) Ltd	Project lead & Report Compiler
2023	Environmental compliance monitoring & Financial provision for Ngwenya mine (Pty) Ltd	Ngwenya mine (Pty) Ltd	Auditor & Report compiler
2023	Environmental compliance monitoring & Financial provision for Franco Sand and Stone (Pty) Ltd	Franco Sand and Stone (Pty) Ltd	Auditor & Report compiler
2023	Environmental compliance monitoring & Financial provision for Analiza Boedery (Pty) Ltd	Analiza Boedery (Pty) Ltd	Auditor & Report compiler
2022	Environmental compliance monitoring of Engen Deports (Langlaagte, Kempton park, Witbank)	Engen Petroleum, South Africa	Project assistant

UNIVERSITY OF KWAZULU-NATAL ™

INYUVESI YAKWAZULU-NATALI

This is to certify that

Nolwazi Lomalangeni Dlamini

was admitted this day
at a congregation of the University
to the degree of

Bachelor of Social Science

(Geography and Environmental Management)

having satisfied the conditions prescribed for the degree

N Poku
Vice – Chancellor

K Cleland
Acting Registrar

VBA Ojong
Acting Dean

30 October 2020

UV PROTECTED

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

At a congregation of the University

held on 19 April 2022

Nolwazi Lomalangeni Dlamini

was admitted to the Degree of

Bachelor of Science Honours

(Geography)

Dean: Faculty of Science

Vice-Chancellor and Principal

Registrar

2022N00343

100 1922 2022

Environmental Assessment Practitioners Association of South Africa

Registration No. 2022/5249

Herewith certifies that

Nolwazi Lomalangeni
Dlamini

is registered as an

Candidate 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

Orlinda Princess Mafika

Environmental Consultant
Pr. Nat. Sci. 135654

Address: Office 1, Palm Place Office Park, 22 Bram Fischer Drive, Linden, Johannesburg 2195
Email: orlinda@niara.co.za
Contact No: +27 74 881 9988

EDUCATION AND QUALIFICATIONS

- MSc. (Environmental Management with Waste Management) North West University (current)
- BSc. Hons. (Environmental Science and Management with Geography) North West University (2018)
- BA (Development and Management) North West University (2017)

AFFILIATIONS

- International Association of Impact Assessment South Africa (IAIASA)- NEC Portfolio holder
- Golden Key International Honor Society

YEARS OF EXPERIENCE

- 6 years

KEY COMPETENCIES

- Water Use Licensing
- Air Quality Impact Assessments
- General Authorisations
- GIS Mapping
- Dispersion Modelling
- Environmental Control Officer
- Performance Assessments (Environmental Audits) on mine EMPrs

BIOGRAPHY

Orlinda Mafika is a dynamic professional with a wealth of expertise in environmental management and regulatory compliance. With a strong focus on driving business growth and operational efficiency, Orlinda excels in monitoring key performance indicators (KPIs) and implementing targeted improvement initiatives to consistently meet or exceed targets.
A strategic thinker, Orlinda is adept at developing and implementing comprehensive strategic plans that propel business growth and optimize operational processes. Her collaborative approach allows her to effectively work with cross-functional teams, streamlining processes, optimizing resources, and enhancing overall productivity.

Orlinda's proactive nature enables her to identify and resolve issues and conflicts, fostering a positive and collaborative work environment. She conducts regular site inspections and compiles compliance audit reports, ensuring adherence to environmental regulations and standards. With expertise in executing and finalizing Water Use License Applications (WULAs), General Authorizations (GAs), and Atmospheric License Applications (AELs), Orlinda plays a crucial role in facilitating major new developments such as industrial plants, mines, feedlots, and farms.

She collaborates with public authorities to improve energy efficiency and introduce recycling schemes, further demonstrating her commitment to sustainability. Orlinda is also skilled in data analysis, conducting analytical modelling to determine environmental compliance for atmospheric conditions and analysing inspection data to assess pollution and contamination levels. Her proficiency extends to the creation of regulatory documents, site layouts, and various types of environmental impact assessments and reports.

With a passion for research and innovation, Orlinda plans, modifies, and executes research techniques and tests, gathering and analysing data to produce insightful reports and

- Compliance Audits on Environmental Authorisations (e.g., ROD's, Water, Air and Waste Licenses)
- Consolidated Compliance Programmes
- Environmental Impact Assessments
- Basic Assessment Reports
- Environmental Authorisation Application reviews
- Waste Management License Applications
- Co-ordinating and conducting Public Involvement processes.
- Public Participation Process and Stakeholder consultation and mediation

COUNTRIES OF WORK EXPERIENCE

- South Africa

LANGUAGES

- English (excellent)
- Afrikaans (intermediate)

presentations. She is dedicated to continuous learning and improvement, staying abreast of industry developments and best practices to deliver exceptional results.

EMPLOYMENT HISTORY

May 2024 – present: Environmental Consultant, Niara Environmental Consultants

March 2023 – March 2024: Environmental Lead and Senior Environmental Consultant, Information Decision Systems, South Africa

January 2021– March 2023: Senior Environmental Consultant, Air Quality Specialist and GIS Technician, Milnex CC Environmental Consultants

January 2019– December 2020: Junior Environmental Consultant and GIS Technician, Milnex CC Environmental Consultants

March 2019 – August 2019: Research Assistant, Department of Environmental Affairs, South Africa

January 2018 – December 2018: Surveyor, North West University and Department of Environmental Affairs, South Africa

January 2016 – December 2018: Supplemental Instruction Facilitator, North West University, South Africa

EXPERIENCE HIGHLIGHTS

The below highlight key recent and relative project experience:

- LandCare EMPr for the construction of groyne and weirs on portion 6 of the farm Allemansfontein 7 in the Western Cape Province, CASIDRA and Western Cape Department of Agriculture: Project Lead; Complier
- Water Use Licence Application for the construction of groyne and weirs on portion 6 of the farm Allemansfontein 7 in the Western Cape Province, CASIDRA and Western Cape Department of Agriculture: Project Lead; Consultant
- Environmental Control Officer for the development of Klipfontein Wellness Center, Johannesburg Development Agency (JDA): Independent Auditor and Reviewer
- Water Use License for the expansion of the N1 in Bloemfontein, SANRAL: Environmental Consultant
- Basic Assessment for the clearance of vegetation for the expansion of cultivation land on site 1342 in Vredendal, Leratong Victim Empowerment Co-operative (Pty) Ltd: Project Manager; Reviewer

Please consult the attached appendix for a comprehensive list detailing the project experiences undertaken.

APPENDIX A: PROJECT EXPERIENCE

Duration	Assignment name / brief description of main deliverables/outputs	Name of client	Role on the assignment
2023	Water Use License Application for the prospecting of alluvial diamonds on the remaining extent of portion 1, portion 2 and portion 3 of the farm Kommandodrif 116, the remaining extent of the farm Doringbult 125, the remaining extent of portion 17 (portion of portion 1), the remaining extent of portion 30 (portion of portion 9) and the remaining extent of portion 32 (portion of portion 9) of the farm Doornbult 123 & the farm Kommandodrif 149, Registration Division HP, near Makwassie, North West Province	Stroomdrift Trust	Project Lead, GIS specialist, consultant and PPP specialist
2022	Water Use License Application for the mining of alluvial diamonds on portion 6, portion 7, portion 8, the remaining extent of portion 9, portion 10 and the remaining extent of the farm Matlabane Stad 299, Registration Division: HO, North West Province	Global Gem (Pty) Ltd	
2022	Water Use License Application for mining of chrome ore and platinum group metals on Portion 6 and Portion 7 of the Farm Nooitgedacht 406, situated near Northam, Limpopo Province	Acacia Resources (Pty) Ltd	
2022	Water Use License Application for the prospecting of alluvial diamonds on portion 9 of the farm Schoonzigt 237, registration division: HO, North West Province	Spring Green Trading 115 (Pty) Ltd	
2022	Water Use License Application for the irrigation of 250ha of maize, wheat, sunflower and 12.5ha of pecan nut trees on the farm Daeraad 1476 and Lake Warden 38 near, Registration division: Hoopstad RD, North West Province	Mahata Mmoho Trust	
2022	Water Use License Application for the abstraction of groundwater for irrigation of 25ha of pecan nuts and 7.5ha of lucerne on the farm Portion 10 of the farm Uitkyk 156, Registration Division HO, in the North West Province	GC Knoetze	
2022	Water Use License Application for prospecting of alluvial diamonds on Portion 1 and the remaining extent of the farm Summerhill 203, Registration division: Herbert, Hay RD, Northern Cape Province	Salt Lake Minerals (Pty) Ltd	
2022	Water Use License Application for mining of alluvial diamonds on portion 1, 2, 3, 4, 5 and the remaining extent of the farm Sanddrift 371, the remaining extent of portion 4 as well as portion 5 and the remaining extent of the farm Magoras 372, and the remaining extent of the farm Lovedale 590, Registration Division: Hay RD, Northern Cape Province	Sandrift Explorations (Pty) Ltd	

Duration	Assignment name / brief description of main deliverables/outputs	Name of client	Role on the assignment
2022	Water Use License Application for prospecting of alluvial diamonds on a certain portion of the remaining extent of the farm Zonderhuis 402, Certain portion of the remaining extent of the farm Onder Plaats 401, Certain portion of the remaining extent of portion 1, certain portion of portion 6, 7 and 9 of the farm Namakwari 656, Registration Division: Gordonia RD, Northern Cape Province	Johan Smit (Morgenson Mining (Pty) Ltd)	
2022	Water Use License Application for the irrigation of Lucerne on the farm Vaalbrug Dolomiet 557, Registration Division Viljoenskroon, Free State Province	Vaalbrug Dolomiet	
2022	Water Use License Application for the Garden Court Kings Beach hotel, Driftsands Drive in Port Elizabeth, Eastern Cape Province	Southern Sun International/ Exprop	
2021	Air Quality Baseline Assessment as part of the EIA process for the mining right on portion 44, portion 45, the remaining extent of portion 46, the remaining extent of portion 266, portion 343, portion 369, portion 370, portion 371 and 372 of the farm Zandfontein 447 and portion 3 of the farm Lekkersukkel Landgoed 454 and the farm Zandfontein 923 near Brits in the North West Province	Thabo-Gaelebale Mineral Resources (Pty) Ltd	
2021	Atmospheric Emissions License Renewal Application for the continuation of brick manufacturing on the farm Biesiebult, near Stella, North West Province	Noordkaap Stenewerke CC	
2021	Air Quality Audit on for clay brick making on portion 333 of the farm Putfontein in Benoni, Gauteng Province	Clyde Brickfields (Pty) Ltd	
2021	General Authorization Application for the mining of Iron Ore and Manganese portion 2 of the farm Kadgame 558, Registration Division Kuruman near Kathu in the Northern Cape Province	Kadgame Mining (Pty) Ltd	
2021	Water Use License Application for prospecting of alluvial diamonds on the farm Kleindoorns 391, the remaining extent of portion 1 of the farm Kleindoorns 192, portion 5 of the farm Kameelkuil 88, the farm Banke 468, the remaining extent and portion 15 of the farm Vaalboschbult 195, portion 9 of the farm Windsor 119, the remaining extent of portion 12 (portion of portion 1) of the farm Rietput 60, portion 12 (portion of portion 1) and portion 18 (portion of portion 8) of the farm Grootlaagte 190, and portion 8 (portion of portion 5) and the remaining extent of portion 11 of the farm Springbok 191, situated near to Schweizer Reneke, North West Province	Kridyn Boerdery (Pty) Ltd	
2021	Water Use License Application for the prospecting of diamonds on the remaining extent of portion 3 the farm Kameelkuil 88, Registration Division HO near Schweizer Reneke in the North West Province	Michael Van Straten	

Duration	Assignment name / brief description of main deliverables/outputs	Name of client	Role on the assignment
2021	Water Use License Application for the irrigation of 100ha of pecan nut trees on portion 23 of the farm Bezuidenhoutskraal 64 and portion 7 of the farm Roodepoort 206, Registration Division: HO, North West Province	Makwassie Spruit Enterprises	
2021	Water Use License renewal application for the mining of alluvial diamonds on the remaining extent of the farm Probeerfontein 292, Registration Division: Hopetown RD, Northern Cape Province	AAA Mining CC	
2021	General Authorization application for the mining of limestone on the farm Wagendrift 100, Registration Division JO, near Mafikeng in the North West Province	Oos Transvaal Kalkverksaffers (OKTV)	
2021	Water Use License for the abstraction of groundwater for breeding of lamb, kids, calves, and pecan nuts on the farm Portion 10 of the farm Uitkyk 156, Registration Division HO, in the North West Province	Wesvaal Delwery Trust	
2021	Water Use License application for the mining of quartzite and sandstone on the remaining extent of portion 2 and 8 of the farm Brandwagt 728, Registration division RD, near Mafikeng in the North West Province	North West Crushers (Pty) Ltd	
2020	Air Quality Baseline Assessment for an EIA application on the remaining extent of portion 3 of the farm Zandheuvel 144, near Kimberley, Northern Cape Province	Kolver Mulke Boerdery	
2020	Atmospheric Emissions License Renewal Application for the continuation of brick manufacturing on the farm Rietfontein 107, near Bloemfontein, Northern Cape Province	Pikka Bricks	
2020	Atmospheric Emissions License Renewal Application for clay brick making on portion 333 of the farm Putfontein in Benoni, Gauteng Province	Clyde Brickfields (Pty) Ltd	
2020	Water Use License application for the mining of diamonds on portion 13, 17, 18, 24 and the remaining extent of portion 2 of the farm Vleeschkraal 142, Registration Division HO near Schweizer Reneke in the North West Province	Paul Pretorius	
2020	Water Use License Application for the mining of diamonds on portion 1, 2, 3 and 4 of the farm Avondster 142, Registration Division HO, near Schweizer Reneke in the North West Province.	Seal A Deal	
2020	Water Use License Application for the prospecting of diamonds on the remaining extent of portion 1, 8, 23 and portions 28 and 44 of the farm Doornhoek 165, Registration Division HO near Schweizer Reneke in the North West Province	Lolacento (Pty) Ltd	
2020	Water Use License Application for the prospecting of diamonds on portion 5 of the farm Van Zoelen's Laagte 158 Registration Division Bloemhof, near Windsorton in the Northern Cape Province	Koedonza Olives (Pty) Ltd	

Duration	Assignment name / brief description of main deliverables/outputs	Name of client	Role on the assignment
2020	Water Use License application for the mining of diamonds on the remaining extent, portion 3, 9 and a portion of portion 10 (previously known and referred to as the remaining extent) of the farm Pienaarsfontein 113, Registration division HO, near Schweizer Reneke in the North West Province	Jodeo Four (Pty) Ltd	
2020	Water Use License application for the prospecting of diamonds on the remaining extent of portion 3 (Anna's Hoop) of the farm Zandheuvel 144, Registration Division Kimberley RD near Kimberley in the Northern Cape Province	Kolver Mulke Boerdery	
2020	Water Use License application for the abstraction of groundwater for breeding pigs on the farm Attie 236, Registration Division Viljoenskroon, Free State Province, near Viljoenskroon	Harmony Piggery	
2020	Renewal Application for the Water Use License Application for the prospecting of diamonds on a on the remaining extent of portion 14 (portion of portion 2) of the farm Bloemheuvel 327, Registration Division HO near Christiana, North West Province	GCT Trust	
2020	Water Use License application for the abstraction of groundwater for the irrigation of pecan nut, maize and lucerne on portion 3 of the farm Klipdrift 462. Registration Division Boshof RD near Boshof in the Free State Province	Felix Y Manalo Foundation	
2020	Water Use License application for the abstraction and storage of groundwater for agricultural activities on the farm Theronshoop 411, Registration Division Hoopstad RD near Hoopstad in the Free State Province	Loomar Boerdery (Pty) Ltd	
2019	Water Use license application for the mining of diamonds on the remaining extent of portion 42 of the farm Doornhoek 165, Registration Division HO, near Schweizer Reneke in the North West Province	Namakwa Diamonds-Northern Node (Pty) Ltd	
2019	Water Use license application for the agricultural activities on portion 3 and 4 of the farm London 112, Registration Division HO near Schweizer Reneke in the North West Province	JRP Vleisverspreiders CC	
2019	Water Use License Application for the prospecting of diamonds on the remaining extent of portion 3 the farm Krompan 85, Registration Division HO near Schweizer Reneke in the North West Province	Japie Van Straten	

Duration	Assignment name / brief description of main deliverables/outputs	Name of client	Role on the assignment
2019	Water Use License Application for the prospecting of diamonds on the remaining extent of portion 2, the remaining extent of portion 1, portion 4, portion 6, portion 9 (portion of portion 2), portion 8 (portion of portion 3), and the remaining extent of portion 3 of the farm Homansvley 110, portion 6 and portion 14 (portion of portion 12) of the farm Vuurfontein 117, portion 12 (portion of portion 10) of the farm Mooilaagte 91 and portion 14 (a portion of portion 11), portion 6, portion 12 (a portion of portion 11) and the remaining extent of the farm Houtvolop 111, Registration Division HO, near Schweizer Reneke, North West Province	PJC Pretorius & Seun Boerdery (Pty) Ltd	
2019	Water Use License Application for the agricultural activities on portion 1, the remaining extent of portion 4 and portion 5 of the farm Pienaarsfontein 113, Registration Division HO near Schweizer Reneke in the North West Province	Alec Pieterse (Agriculture)	
2019	Water Use License Application for the prospecting of diamonds on the remaining extent of portion 1 of the farm Gezicht 265, Registration Division HO near Schweizer Reneke in the North West Province	Coenraad Du Toit	
2019	Water Use License Application for the prospecting of diamonds on portion 9 (portion of portion 1), remaining extent of portion 25 (portion of portion 4) of the farm Diamanddoorns 169, the remaining extent of portion 1, portion 5 of the farm Zitland 171 & portion 12 (portion of portion 7) of the farm Doornhoek 165, Registration Division: HO, North West Province	PRC Boerdery (Pty) Ltd	
2019	Water Use License Application for the abstraction of groundwater for irrigation purposes for pecan nut orchard on portion 14 (a portion of portion 1) of the farm Grootpoort 83, Registration Division HO, North West Province, near Schweizer Reneke	Grootpoort Neute	
2019	Water Use License Application for the prospecting of diamonds on portions 50, 51, 52, 53, 544, 55, 56 and 58of the farm London 112, Registration Division HO near Schweizer Reneke in the North West Province	Rietput Delwery CC	

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BACHELOR OF ARTS

in

DEVELOPMENT AND MANAGEMENT

awarded to

ORLINDA PRINCESS MAFIKA

after complying with all the requirements

9 May 2018

Prof ND Kgwadi
Vice-Chancellor

Prof M Verhoef
Registrar

University Number: 26918676
Serial Number: 323960

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BACHELOR OF SCIENCE HONOURS IN ENVIRONMENTAL SCIENCES

with

GEOGRAPHY AND ENVIRONMENTAL MANAGEMENT

awarded to

ORLINDA PRINCESS MAFIKA

after complying with all the requirements

26 March 2019

Prof ND Kgwadi
Vice-Chancellor

Prof M Verhoef
Registrar

University Number: 26918676
Serial Number: 744996

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Orlinda Princess Mafika

Registration Number: 135654

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)

Effective **20 April 2023** Expires **31 March 2025**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

Continuing Professional Development

This certifies that

Orlinda Mafika

Completed

a 2 day in-person Training Course

Integrating Climate Change into EIA

hosted by IAIAsa

at Garden Court ORT on 11 & 12 April 2024

2 Category 1 CPD Points

SACNASP 2024-0447-003031

EAPASA TC-0003-EAP22

Business Success Solutions

CERTIFICATE OF TRAINING

Environmental Legal Compliance, Auditing and Monitoring

Date: 06th – 07th June 2023

Venue: Emperors Palace, Johannesburg

Course Details

Monitoring, auditing and preparing audit checklists.

Understand and interpret environmental legal framework and legislation.

Identifying applicable legislation & preparing your legal register.

Licensing and registrations, duties of care and company, director and employee liabilities.

Handling EMI inspections, compliance notices and directives.

This is to certify that

Orlinda Mafika

9701050048085

Attended the above course

Director (BSS)

Janice Tooley

Accreditation No: 2021-0021-001881 (2 CPD Points)

SACNASP
South African Council for Natural Scientific Professions

Accreditation No: TC-0001-EAP22 (2 CPD Points)

Environmental Assessment Practitioners Association of South Africa

National Association for Clean Air

This is to certify that

Orlicosdor Mlafika

attended the short course

Introduction to Dispersion Modelling

11-13 JUNE22 2018

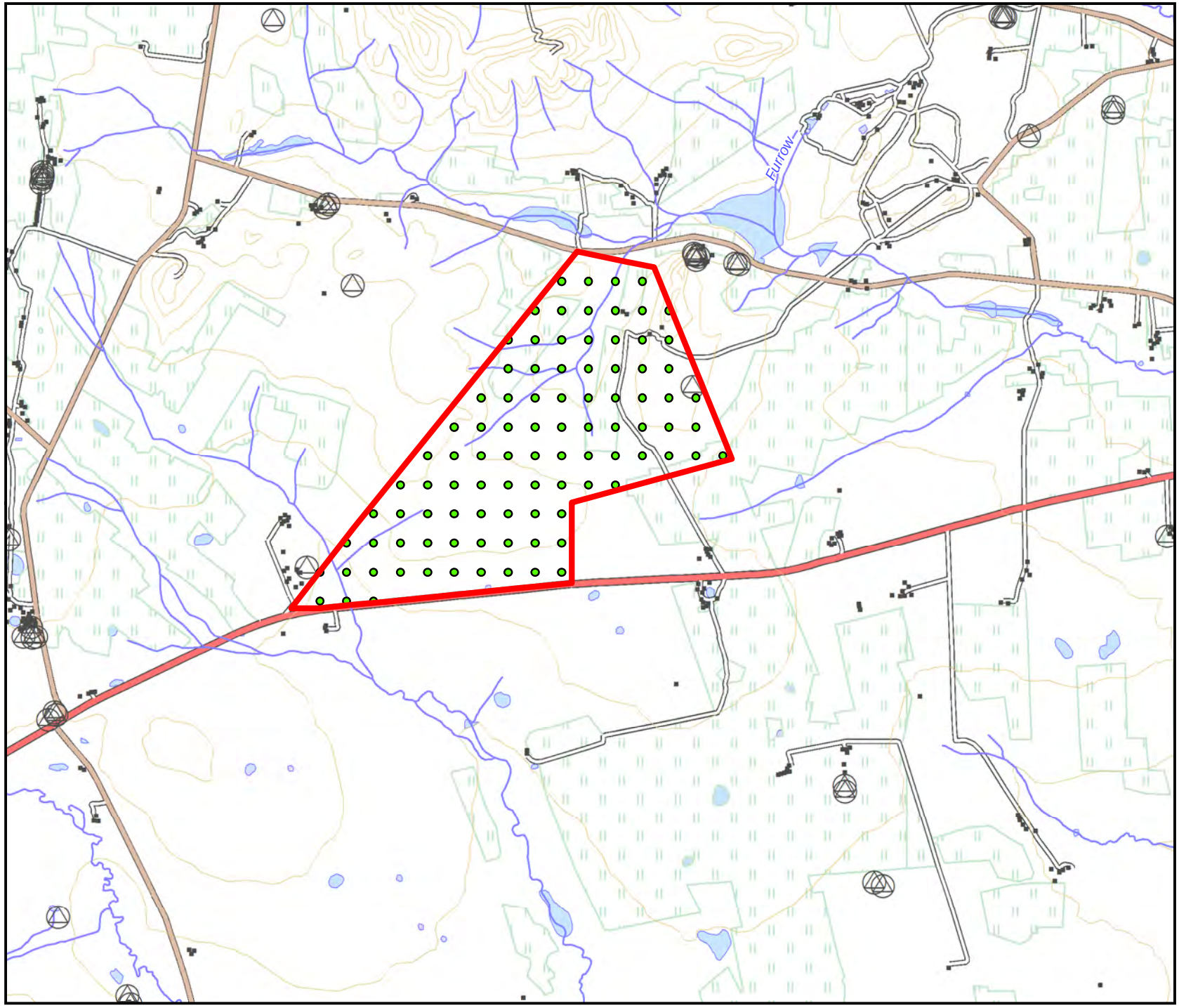
Dr Roelof Burger
Senior Lecturer: NACA

Professor Stuart Piketh
Vice President: NACA

NACA • NATIONAL ASSOCIATION FOR CLEAN AIR

CERTIFICATE

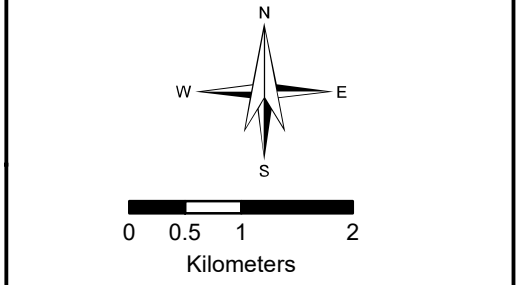
Appendix B: Maps & Plans



Africa Gulf International Mining

Legend

- Proposed Prospecting Application Area
- Proposed Boreholes

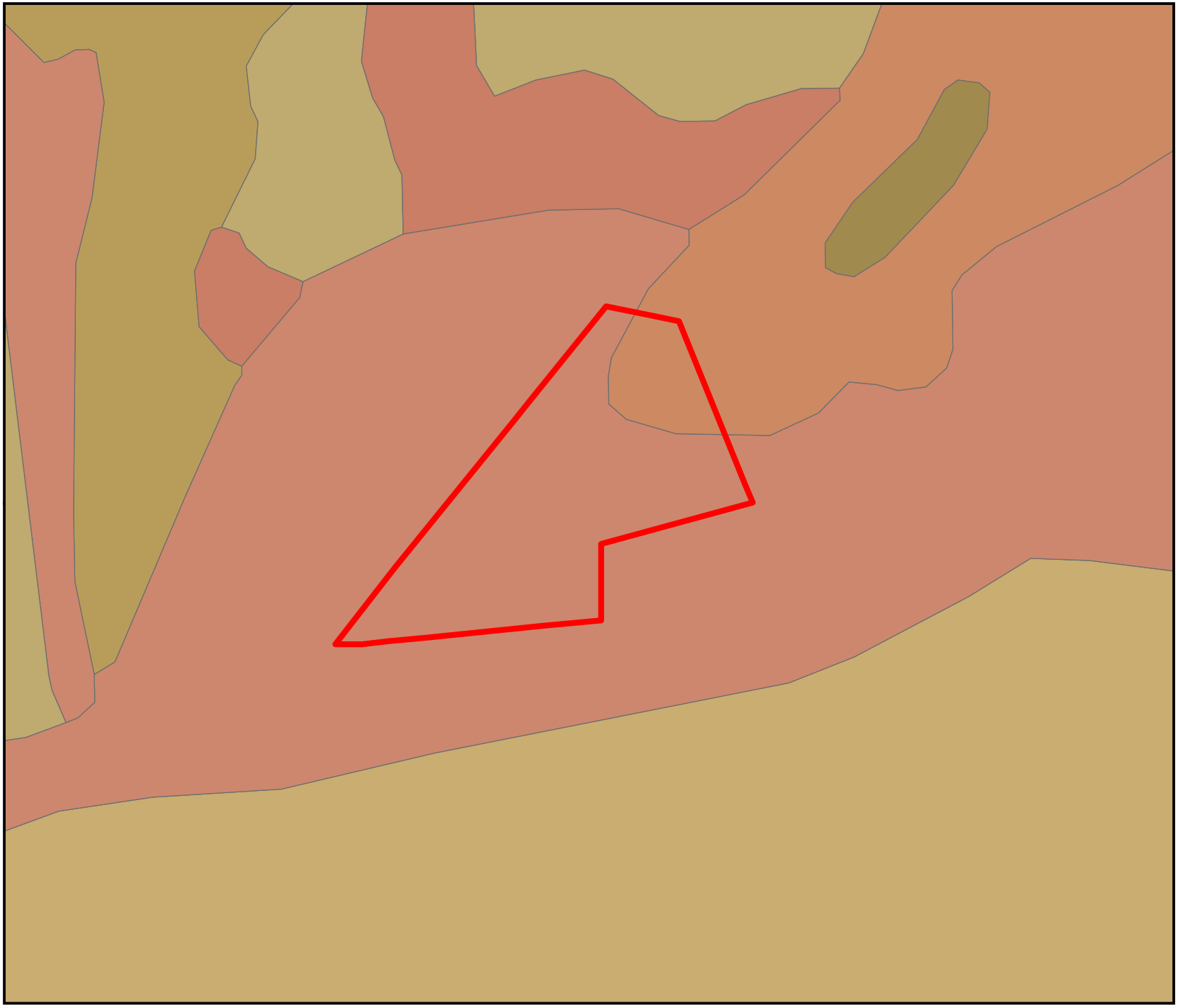


Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

Date: 10/30/2023

Map Title:
Preliminary Drill Site Plan

Project Name
Elandslaagte Prospecting Project



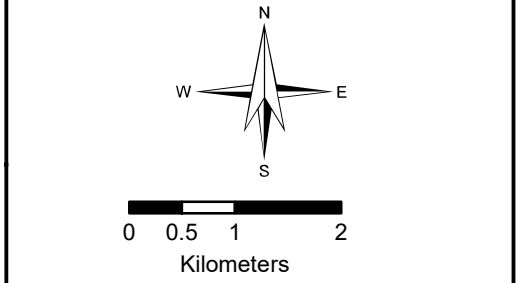
Africa Gulf International Mining

Legend

Proposed Prospecting Application Area

Geology

- Allanridge Fm, Platberg Grp
- Dominion Grp
- Government Sbgrp, West Rand Grp
- Hospital Hill Sbgrp, West Rand Grp
- Jeppestown Sbgrp, West Rand Grp
- Rietgat Fm, Platberg Grp
- Swazian Erathem

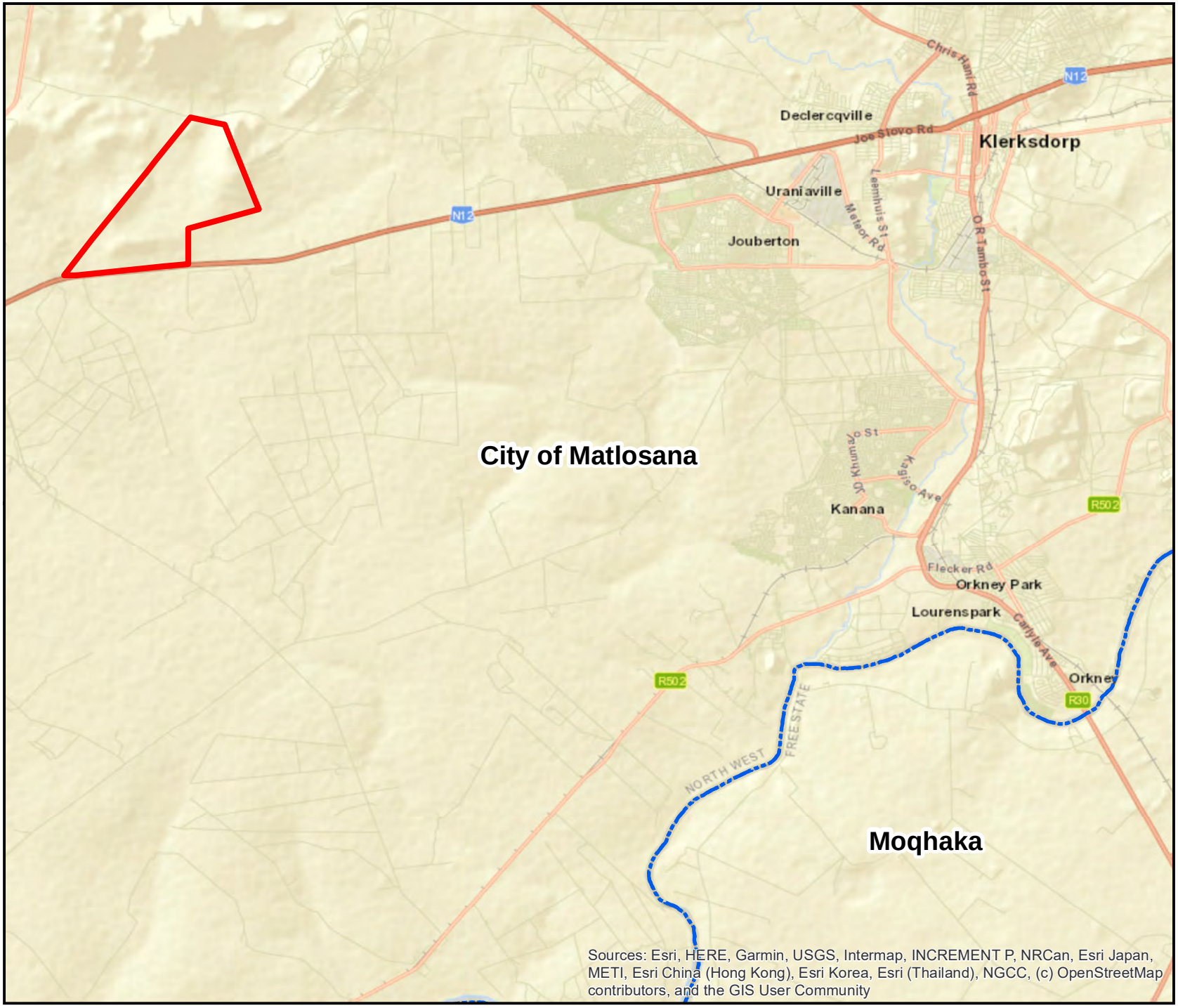


Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

Date: 10/30/2023

Map Title: Geological Map

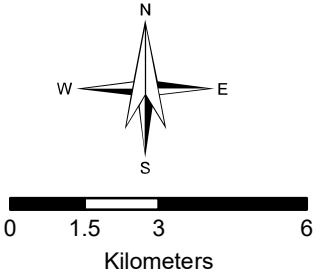
Project Name Elandslaagte Prospecting Project



Africa Gulf International Mining

Legend

- Proposed Prospecting Application Area
- Local Municipalities



Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

Date: 10/26/2023

Map Title:

Regional Locality

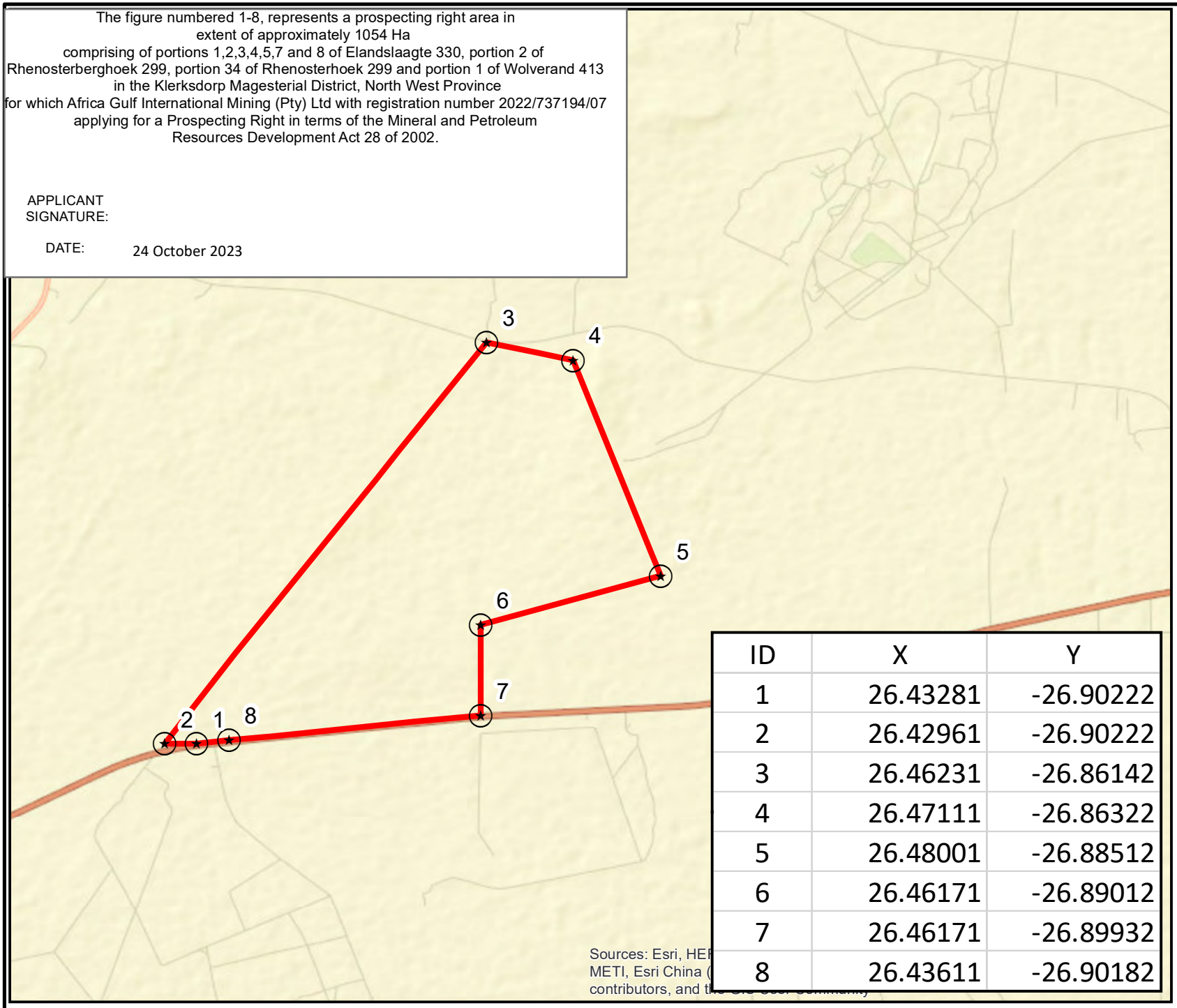
Project Name

Elandslaagte Prospecting Project

The figure numbered 1-8, represents a prospecting right area in extent of approximately 1054 Ha comprising of portions 1,2,3,4,5,7 and 8 of Elandslaagte 330, portion 2 of Rhenosterberghoek 299, portion 34 of Rhenosterhoek 299 and portion 1 of Wolverand 413 in the Klerksdorp Magesterial District, North West Province for which Africa Gulf International Mining (Pty) Ltd with registration number 2022/737194/07 applying for a Prospecting Right in terms of the Mineral and Petroleum Resources Development Act 28 of 2002.

APPLICANT SIGNATURE:

DATE: 24 October 2023



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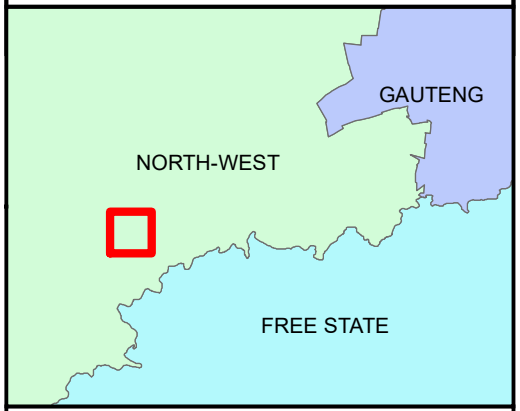
2	26.42961	-26.90222
3	26.46231	-26.86142
4	26.47111	-26.86322
5	26.48001	-26.88512
6	26.46171	-26.89012
7	26.46171	-26.89932
8	26.43611	-26.90182

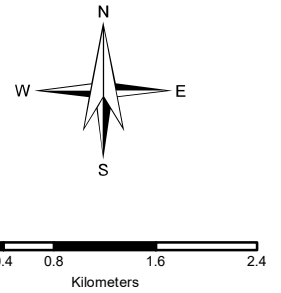
Sources: Esri, HE... METI, Esri China (... contributors, and the GIS User Community

Africa Gulf International Mining

Legend

Proposed Prospecting Application Area





Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

Date: 10/26/2023

Map Title: Regulation 2(2)

Project Name: Elandslaagte Prospecting Project